

# CONNECTING AUSTRALIA

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Report of the  
Telecommunications Service Inquiry

TELECOMMUNICATIONS  
SERVICE **INQUIRY**

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This report was developed for the Commonwealth by the independent Telecommunications Service Inquiry. It draws on information, opinions and advice provided by a variety of individuals and organisations during the Telecommunications Service Inquiry. This report does not necessarily reflect the views of the Commonwealth or indicate its commitment to a particular course of action.

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Produced by the Commonwealth Department of Communications, Information Technology and the Arts

# TELECOMMUNICATIONS SERVICE INQUIRY

Senator the Hon Richard Alston  
Minister for Communications, Information Technology  
and the Arts  
Parliament House  
CANBERRA ACT 2600

Dear Minister

On behalf of my colleagues, Ms Jane Bennett and Mr Ray Braithwaite, I have pleasure in submitting to you the report of the Telecommunications Service Inquiry. This report is a comprehensive and, we believe, timely analysis of the service and access issues which are important to Australians in metropolitan, regional, rural and remote areas.

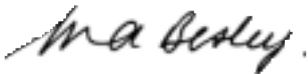
The Inquiry met with telecommunications users, industry players, and interested stakeholders from all over Australia. We also commissioned independent research to supplement our analysis.

Our Inquiry shows that Australians are keen to participate in the information economy and that consumers at all levels are demanding more and more telecommunications services.

We also found that while the majority of Australians enjoy adequate services, there are some people in parts of rural and remote Australia for whom key service aspects are not adequate. Therefore, we would urge the Government to give priority to our recommendations.

I commend this report to you.

Yours sincerely



M A (Tim) Besley  
Chairman

30 September 2000



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# EXECUTIVE SUMMARY



On 19 March 2000, the Minister for Communications, Information Technology and the Arts, Senator the Hon Richard Alston established the Telecommunications Service Inquiry to assess and make a certification on the adequacy of telecommunications services in Australia.

This Inquiry has been conducted in the midst of substantial change in the telecommunications industry. This change is being driven by technological advances, commercial pressures and a rapid growth and diversification in consumer demand. The industry is also being influenced by a number of government processes, including a review of competition regulation in telecommunications and the implementation of contestability arrangements for the Universal Service Obligation.

There is also very strong growth in the expectations of Australians generally regarding the services they should receive from the telecommunications industry. A large proportion of Australians now expect not only a reliable telephone service, but access to the Internet at reasonable speeds as well as mobile phone services. Many also seek the benefits of more advanced services, some of which are not yet available in the mass market either here or overseas. Those expectations continue to be fuelled both by governments, through their statements of policy vision for the information economy, and the industry, through its marketing efforts.

The Inquiry has carefully considered over 1000 submissions from individuals and groups, together with the views expressed during 31 roundtable meetings and consultations held across Australia. During the consultative process, a number of consistent themes emerged in relation to the telecommunications needs of Australians and the extent to which people believed those needs are being met.

Of particular note is the greater degree of concern expressed by rural and remote Australians about service levels compared with those in metropolitan areas. Approximately 30 per cent of all submissions received by the Inquiry were from the six per cent of Australians who live in the least accessible parts of this country.<sup>1</sup>

Consultations revealed a strong expectation by customers in all parts of Australia that they will have access to a wide range of telecommunications services, that those services will generally work well, and that when difficulties arise they will be able to get advice and assistance promptly.

People in regional, rural and remote Australia told the Inquiry they want access to services on an equitable basis compared with their counterparts in metropolitan and large urban centres.

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1 Approximately six per cent of Australians live in areas defined as 'very remote', 'remote' or 'moderately accessible' using the Accessibility Remoteness Index of Australia, detailed in the Department of Health and Aged Care Occasional Paper No 6.

The Inquiry heard the frustration of many consumers, particularly concentrated in rural and remote Australia, in getting basic and reliable telephone services connected quickly and repaired in a timely manner. This frustration is exacerbated when consumers deal with call centres which are unaware of their circumstances and cannot provide a continuity of contact to track their service request.

A substantial number of those who contributed to the Inquiry pointed to the problems they experienced as a result of service reliability, dated network capabilities or issues regarding the infrastructure available in their area.

Many consumers, again with a greater concentration in rural and remote Australia, experience slow data speeds when accessing the Internet. These people are sometimes further disadvantaged in lacking access to the Internet at local call rates.

Many of these difficulties have been acknowledged by the telecommunications service providers themselves. In their submissions, and during meetings with the Inquiry, most of the service providers acknowledged that despite recent market developments, a proportion of the Australian community does not currently enjoy access to a full range of reliable and advanced communications services.

The Inquiry undertook its own analysis and commissioned specific research to gain a clear picture of the telecommunications services Australians consider important and the extent to which those service needs are being met.

There is great diversity in the telecommunications services that Australian individuals and businesses require. This diversity comes not only from the changing role of telecommunications in different parts of our society and economy, but also from the choices individuals now make from the range of services available.

The highest priority for residential customers remains the basic fixed telephone service—although mobile phones and Internet access are important to a growing proportion of those customers. For business and government users, telephony, data and mobile services are all important, but to differing degrees across different sectors. There is also a number of Australians who have special needs or particular preferences for certain telecommunications services, including people with disabilities, people with severe medical conditions and residents of remote Indigenous communities.

Market research conducted for the Inquiry found that most Australians are generally satisfied with the services delivered by their telecommunications provider. These findings are reinforced by similar work conducted by the Australian Communications Authority. The research also found, however, higher than average levels of dissatisfaction in some key areas, such as prompt fault repair and the ease with which they can deal with their service provider. These findings reinforce the message from the Inquiry's consultations that service reliability and customer/service provider contact are areas of concern for a number of consumers. Dissatisfaction levels were higher with users, particularly small businesses, in remote areas—although even here levels of satisfaction outweighed dissatisfaction.

The Inquiry examined the performance of the telecommunications industry against the Customer Service Guarantee (CSG). Evidence presented showed that industry performance against the CSG has improved since its introduction in 1998. Telstra's performance, in particular, is generally at, or approaching, levels which meet reasonable public expectations.

There is evidence, however, of isolated cases where Telstra's performance is well outside the CSG standard. The Inquiry's consultations highlighted the significant impact on individuals and businesses when they are among the small proportion of customers whose service need is not met within the timeframe of the standard.

The Inquiry also found evidence of:

- ▶ reliability problems in some parts of Telstra's network;
- ▶ individual examples of below standard infrastructure (for example, repaired cables being left on the ground);
- ▶ dissatisfaction with apparently inefficient service despatch systems, a lack of continuity in communication between consumers and Telstra, and limited understanding of the circumstances of rural and remote consumers; and
- ▶ a broader current of frustration from consumers who feel that Telstra is unwilling to provide information, advice and support to enable them to make the best use of their telecommunications services.

In relation to Internet access, the Inquiry found that the vast majority of residential and small business customers in Australia are able to obtain access via their standard telephone service at reasonable speed for key functions. However, there is a small but significant number of customers, more heavily concentrated in rural and remote areas, for whom access to the Internet over their phone lines is slow, or impossible, and who must therefore consider higher priced, high data speed options to meet their needs. These customers are effectively disadvantaged in lacking the ability to choose cheaper, albeit slower, access to the Internet.

While most large businesses, government agencies and other high volume users have substantial purchasing power and are well served, those with significant presence in rural and remote locations can experience difficulties in accessing services which meet their needs.

With the advent of satellite mobile telephony, all Australians can now access a mobile service. Those who live outside the coverage of terrestrial networks do, however, currently face higher costs for their service.

The Inquiry found that particular communications needs of remote Indigenous communities are not being fully met by existing arrangements. Improved awareness and resourcing is also needed to ensure the special needs of people with disabilities and people with critical communications requirements are met.

It is important from a national perspective that the existing telecommunications disadvantage experienced by many Australians in rural and remote areas is addressed. The rural (farm, forestry and fisheries) and mining sectors collectively account for nearly 60 per cent of Australia's total exports.<sup>2</sup> If those sectors are to continue to contribute to the wealth of the nation they must be capable of operating online—whether to manage relationships with suppliers and customers, or to monitor the weather or markets. Similarly, if rural and remote communities are to grow and prosper, their citizens need to have access to effective telecommunications services not just to communicate for social and emergency reasons, but increasingly to access a range of vital community services.

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<sup>2</sup> Productivity Commission, *Impact of Competition Policy Reforms on Rural and Regional Australia*, 1999, p. 50.

Telstra advised the Inquiry that it has taken a number of initiatives to address core service concerns. These include the establishment of Telstra Country Wide, a significant capital program to upgrade the customer access network (known as Access Renewal), and reforms to its call centre and service despatch systems. Telstra's Access Renewal program and dedicated remote radio service centre (1800 RRADIO) have had a quantifiable effect in improving its service performance, but the success of its more recent initiatives will be determined by the extent to which Telstra can address the service issues placed before this Inquiry.

From a community perspective, the only way in which the service issues can be effectively addressed is by placing increased competitive pressures on Telstra and other providers. It is not possible to regulate for 'good' service by call centres or improved responsiveness to the individual needs of residential or business customers. Enhanced regulatory monitoring and intervention can be effective in addressing some issues—such as service reliability—and in areas where competition has not matured. However, it is important to ensure that the prospects of increased competition are not unintentionally damaged by the imposition of further regulation.

It is also fair to say that the community can no longer expect a single provider to meet all the communications needs of all Australians. Nor is it possible to identify a single set of service requirements which will meet individual and business needs. In seeking to achieve equity of service for all Australians, the objective should be equitable access to a choice of service and price alternatives.

The Inquiry's analysis of proposed new services and networks suggests that a real growth in the level of competition will take place across all areas of Australia over the next few years. New technologies, increased demand and the diversification of demand are opening up ever increasing opportunities for new players. The plans of a number of providers—many of which were announced during the Inquiry—illustrate this potential. New market models are developing across Australia, most in regional markets, enabling new entrants to find competitive advantages and better meet the needs of the regions they serve.

A number of key government interventions will also have a material impact on service levels in the near future. The so-called 'Extended Zone' tender and Universal Service Obligation (USO) contestability pilots appear likely to encourage the market to offer significant service improvements to regional, rural and remote customers. Targeted assistance, such as ensuring all Australians have untimed local call access to the Internet and improving mobile coverage along key highways, will also address many of the issues raised during the Inquiry.

Continued government assistance—financial and advisory—will be necessary to foster the development of new market models and other regional telecommunications projects. Some lessons can be learnt from the experience with Networking the Nation to improve the commercial focus of this assistance and ensure the benefits of such programs are felt in all regions.

## CERTIFICATE

The Inquiry has concluded that Australians generally have adequate access to a range of high quality, basic and advanced telecommunications services comparable to the leading information economies of the world. The Inquiry research indicates Australians who live in metropolitan and regional centres enjoy good telecommunication services and are generally satisfied with them. However, a significant proportion of those who live and work in rural and remote Australia have concerns regarding key aspects of services which, at this stage, are not adequate. Their concerns relate primarily to

- ▶ the timely installation, repair and reliability of basic telephone services;
- ▶ mobile phone coverage at affordable prices; and
- ▶ reliable access to the Internet and data speeds generally.

The Inquiry's analysis suggests that the continued development of competition throughout Australia, combined with key government initiatives (such as USO contestability) will have a positive effect on services over the next few years. These developments are likely to materially improve the services available to rural and remote consumers.

The recommendations which follow provide a framework in which to address identified areas of concern to ensure the telecommunications sector will continue to improve the services available to all Australians.

## RECOMMENDATIONS

**Recommendation 1:** That the Productivity Commission's review of telecommunications-specific competition regulation have regard to the differing levels of competition across Australia and consider whether a greater recognition of those different circumstances should be incorporated into competition regulation.

**Recommendation 2:** That the Productivity Commission's review also be asked to specifically consider the implications of current pay television programming arrangements for the development of telecommunications competition in regional Australia and consider whether any additional regulatory measures are needed to facilitate access to pay television programming.

**Recommendation 3:** That the Government offer up-front incentives to potential alternative universal service providers in return for their commitment to supply, as a standard service, substantial improvements above the legislated minimum.

**Recommendation 4:** If the contestability processes announced by the Government do not have the effect of materially improving service levels in regional, rural and remote areas, the Government should reassess policy measures, including the USO, with a view to ensuring the contemporary telecommunications needs of all Australians are met.

**Recommendation 5:** That the Customer Service Guarantee be amended to apply only to universal service providers.

**Recommendation 6:** That all reviews of telecommunications-specific regulation be required to explicitly consider the impact of those regulatory mechanisms on the development of competition in regional, rural and remote Australia.

**Recommendation 7:** That the Government refocus the existing programs supporting new market models and regional communications initiatives by placing more emphasis on strategic support and advice to regions and commercially-focused funding (such as through concessional loans or project investment).

**Recommendation 8:** That the Government establish a national communications fund to assist significant communications projects by key users such as education or health. A core criterion for funding such projects should be the extent to which they will improve communications services generally available to surrounding regional, rural and remote communities.

**Recommendation 9:** That the Australian Communications Authority establish standard quality of service indicators to be adopted by all major service providers. Those providers should be required to publish their performance against those indicators on a regular basis.

**Recommendation 10:** That a member of the Australian Communications Authority be appointed to be responsible for the Authority's activities in monitoring and investigating quality of service issues. This member should have particular regard to regional, rural and remote issues.

**Recommendation 11:** That the Australian Communications Authority be required to monitor fault rates in any universal service provider's network at a highly disaggregated level (at least at 'distribution area' level in Telstra's network) to identify reliability problems. The Australian Communications Authority should be empowered to direct a universal service provider to take specific action to address identified reliability issues.

**Recommendation 12:** That the Australian Communications Authority identify and investigate extreme cases of failure by providers to meet Customer Service Guarantee standards.

**Recommendation 13:** The Australian Communications Authority should be requested to review the operation of the Customer Service Guarantee in a multicarrier/multiplatform environment to determine whether existing, common standards remain appropriate. In particular, the standards applying in circumstances where no infrastructure is readily available should be reviewed to ensure the sources of consumer frustration are reduced and appropriate incentives put in place to encourage effective capacity planning.

**Recommendation 14:** That funding for representation of consumers be extended beyond the current budget allocation, and consideration given to providing funding on a longer term basis than the existing annual cycle to ensure greater stability for consumer organisations. Provision should also be made for additional resources to assist people with disabilities participate in industry processes and conduct awareness raising activities.

**Recommendation 15:** That carriers improve the level of information available to the public about emergency and health-related priority services; the ability of customer service staff to advise customers on obtaining priority status; and the availability of relevant criteria for gaining priority.

**Recommendation 16:** That a training program for users of teletypewriter (TTY) machines be incorporated into the National Relay Service.

**Recommendation 17:** That consideration be given to establishing a scheme to source basic and advanced communications services for remote Indigenous communities. The scheme should be firmly driven by the identified communications needs of these communities. The scheme could be funded with an initial capital injection from Government and benefit from ongoing supplementation based on the estimated proportion of the net universal service cost currently attributable to such communities.

The Inquiry urges the Government to give priority to the above recommendations so that all Australians—wherever they may live or work—will have access to adequate telecommunications services in the shortest, practicable time.

The Inquiry is confident that adoption of these recommendations, combined with existing commercial developments and government initiatives, are appropriate measures for a rapidly changing and dynamic telecommunications sector.

The Inquiry also urges the Government to continue to provide financial and strategic assistance to ensure that those currently disadvantaged—especially in regional, rural and remote Australia—are able to take their place in an information society.





# CHAPTER 1

## INTRODUCTION



### BACKGROUND

On 19 March 2000 the Minister for Communications, Information Technology and the Arts, Senator the Hon Richard Alston, established the Telecommunications Service Inquiry to independently assess the adequacy of telecommunications services in metropolitan, regional, rural and remote Australia.

The members appointed to the Inquiry panel were Mr M A (Tim) Besley, AO (Chairman), Ms Jane Bennett and Mr Ray Braithwaite. The Inquiry was assisted by a secretariat drawn from the Department of Communications, Information Technology and the Arts, Australian Communications Authority and Department of Transport and Regional Services.

Announcing the Inquiry, Senator Alston referred to ‘The Coalition’s 1998 election policy [which] committed the Government to an independent service inquiry prior to any sale of Telstra beyond its current level of 49 per cent private ownership.’ The Minister went on to say: ‘The policy states that unless and until the inquiry certifies that service levels are adequate there will be no sale beyond 49 per cent.’ Under its terms of reference, the Inquiry was not required to address—and did not address at any time—issues relating to the further sale of Telstra.

### TERMS OF REFERENCE

The terms of reference state:

The Coalition’s 1998 election policy commits the Government to an independent service Inquiry prior to any sale of Telstra beyond its current level of private ownership. The policy states that unless and until the Inquiry certifies that service levels are adequate there will be no sale beyond 49 per cent.

In accordance with its election commitment, the Coalition Government is establishing an independent Inquiry to assess service levels to customers in metropolitan, regional, rural and remote areas. In accordance with the Coalition’s election commitment, this assessment will occur against specified performance criteria, namely the legislated Customer Service Guarantee (introduced by the Coalition Government) and Telstra’s own public commitment to continuously improve its current service levels.

In assessing the adequacy or otherwise of telecommunications services, the Inquiry shall consider the extent to which Telstra and other carriers and service providers:

- are meeting their statutory requirements under the Customer Service Guarantee (CSG) in metropolitan, regional, rural and remote areas in accordance with reasonable public expectations of service levels;

- are demonstrating ongoing improvement in their adherence to these statutory requirements in metropolitan, regional, rural and remote areas;
- have established effective processes to enhance their responsiveness to disadvantaged groups (e.g. the elderly and medical emergencies) and to minimise the occurrence of unacceptable service delays; and
- are addressing both the basic and advanced telecommunications needs of all Australians, regardless of where they live.

In conducting its assessment, the Inquiry shall have particular regard to:

- (a) Those services required to be made available on an equitable basis to all Australians under the Government's legislated Universal Service Obligation (USO);
- (b) The nature and range of new and enhanced services being offered, or to be offered, by carriers and service providers;
- (c) Network rollout and upgrade and other investment plans by carriers and service providers which are likely to impact on services, particularly in regional, rural and remote Australia;
- (d) The current and likely future impact on services resulting from the delivery of the Government's Networking the Nation (NTN) program and Telstra 2 social bonus commitments; and
- (e) Potential new technologies, products and market models (e.g. competitive tendering of the USO) that are likely to enhance the delivery of telecommunications services, particularly in regional, rural and remote Australia.

In its report, the Inquiry shall certify whether or not existing telecommunications service levels are adequate. It shall also provide advice to the Government on:

- i. The appropriate circumstances in which the Australian Communications Authority (ACA) should consider using its services power of direction to ensure the ongoing adequacy of telecommunications services;
- ii. Whether existing and future technologies combined with the competitive market model are likely to continue to meet the telecommunications needs of all Australians; and
- iii. Whether any adjustments to existing Government policies are required to provide equitable access to telecommunications services and to overcome identified areas of disadvantage, including in regional, rural and remote areas of Australia.

The Inquiry is to be conducted in such a way as to enable extensive public input by businesses and consumers, including those in regional, rural and remote Australia, and by the telecommunications industry. The Inquiry will invite written submissions and will undertake field trips involving consultations with the public.

The Inquiry is to report to the Minister for Communications, Information Technology and the Arts by 30 September 2000.

## APPROACH TO THE CONDUCT OF THE INQUIRY

In essence, the terms of reference ask the Inquiry to make a judgement as to whether service levels are adequate having regard to a range of criteria. They specifically require the Inquiry to undertake extensive public consultation with consumers and businesses, including those in regional, rural and remote Australia.

The Inquiry members met regularly over the period of the Inquiry. The Inquiry members also met a range of key stakeholders and considered the approach it would take to complete its task. The Inquiry has relied on a variety of sources to gather the information necessary for it to address its terms of reference.

The Inquiry sought written submissions from members of the public and interested industry, consumer and community organisations to be lodged by 31 May 2000. The invitation to make a submission was widely publicised through advertising in the national and regional press. A direct mail invitation was sent to around 500 addressees, including industry and community organisations, all federal MPs and Senators and relevant State and Territory Ministers. In addition, the Chairman and Inquiry members undertook media interviews. A dedicated website and Inquiry telephone line were established to assist people to gain information about the Inquiry and the consultation process. The Inquiry received a total of 1076 written submissions, a number of which represented organisations or groups. All submissions—including those received after 31 May—were taken into consideration.

The majority of submissions received electronically have been published on the Inquiry's website at [www.telinquiry.gov.au](http://www.telinquiry.gov.au). Submissions which requested confidentiality have been excluded. Information and views contained in all submissions were reviewed by the Inquiry and have been an important resource for its deliberations. A statistical analysis of all submissions represents one element in arriving at an overall view regarding carrier and carriage service provider performance. This analysis has been a valuable input to many of the conclusions contained in this report.

In addition to inviting submissions, the Inquiry also issued an information request to all licensed telecommunications carriers seeking data about their business activities, investment plans and performance against key quality of service indicators. A total of 19 responses were received from the 41 telecommunications carriers approached.

The Inquiry held 31 roundtable meetings—including four by video conference—in all States and the Northern Territory during June and July, with almost 300 individuals and representatives of organisations who had made submissions. These meetings enabled the Inquiry to pursue issues raised in submissions in more detail and to hear, first hand, the experiences of a wide range of telecommunications users. A roundtable discussion was also held with many of the industry players who contributed submissions to the Inquiry.

Further detail on the consultation process is provided at Appendix A.

To assist in its research on the adequacy of telecommunications services the Inquiry commissioned three consultancies. The consultants were selected following an open tender process. One consultancy undertook market research on the perceptions of residential and small business users about their telecommunications service needs, the aspects of telecommunications service which are important to them and their satisfaction with those service aspects. The second consultancy consisted of an evaluation of telecommunications

needs for a comprehensive range of users, while the third involved research on new market models for the development of competitive supply of services, particularly in regional, rural and remote Australia. The consultants' findings have been used where relevant in this report and the reports are published in full on the Inquiry's website.

The Inquiry was also able to draw upon other recent inquiries and ongoing monitoring work relating to industry performance and public perceptions—most notably work undertaken by the Australian Communications Authority (ACA).

The Inquiry wishes to express its appreciation to all those who participated in the Inquiry process and to the Secretariat which assisted it.

## CONTEXT OF THE INQUIRY

The Inquiry took place during a period in which a number of commercial, regulatory and policy processes were underway. These included:

- a review by the Productivity Commission of telecommunications-specific competition regulation;
- legislative and administrative activities to develop and implement contestability models in the Universal Service Obligation (USO), including tender processes to introduce untimed local calls in extended zones;
- industry and regulatory work to allow other telecommunications providers to use Telstra's customer access network (known as 'unbundling the local loop');
- introduction of a revised Customer Service Guarantee (CSG) standard; and
- Telstra's review of its call zone system.

During the course of this Inquiry, Telstra also announced its Country Wide initiative, discussion of which is in Chapter 5.

In a sector as dynamic as telecommunications, it would be impossible to defer coming to a judgement until all these other processes are worked through. Nevertheless, the conclusions of the Inquiry are necessarily based in part on judgements regarding their likely impact.

## STRUCTURE OF THE REPORT

The remainder of this report is structured as follows. Chapters 2 and 3 set the scene for the analysis in the subsequent chapters of the report. Chapter 2 outlines some of the more substantial changes occurring globally in telecommunications as the old 'telephony' world is replaced by a wide array of service offerings, increasing competition and technological change, and a diversification of the role of telecommunications in Australian society. It briefly discusses the implications of these developments for telecommunications policy. Chapter 3 describes the developments which have taken place in the Australian telecommunications industry in recent times, the current market structure and regulatory environment.

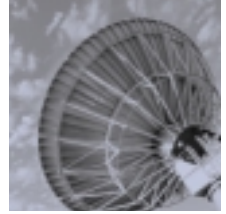
Chapters 4 to 7 are the heart of the analysis. Chapter 4 discusses the demand profiles for residential consumers, for business, and for government, including any differentiated requirements which are a function of the customer's location. Chapter 5 deals with industry performance, including those services which the Government has chosen to regulate under the CSG and USO. Chapter 6 considers the extent to which the industry is adequately addressing the broader telecommunications needs of all Australians (including for example, mobile telephony and Internet services).

The terms of reference also require the Inquiry to consider the impact of market dynamics, impending technological developments and existing Government programs (such as Networking the Nation and the social bonus initiatives arising from the second tranche sale of Telstra) in coming to a view of whether industry performance is adequate. This analysis, contained in Chapter 7, places emphasis on existing trends and market developments rather than on any 'crystal ball' predictions of what might or might not happen in the future.

In the final analysis, the Inquiry has been asked to make a judgement about the overall adequacy of industry performance, having regard to all the matters briefly identified above. That judgement, and the policy conclusions flowing from it, are dealt with in Chapter 8.



## CHAPTER 2 THE TELECOMMUNICATIONS CONTEXT



### SUMMARY

The telecommunications sector today is characterised by immense technological advances, increasing diversity in both supply and demand, and complex market changes.

It is also becoming increasingly globalised—providing both new opportunities and potential threats for Australia.

Governments are seeking to encourage business and the community generally to take advantage of the possibilities presented by these developments. Important for the nation as a whole is the challenge to ensure that all Australians can participate in the evolving information economy.

This challenge is made difficult by the increasing complexity of policy goals; the need to ensure that interventions do not stifle the very market dynamism from which we seek to benefit; and the disappearance of the stability and predictability of the past.



## BACKGROUND

The functional importance of telecommunications has long been recognised in Australian society. For many decades, universal access to a basic telephone service at an affordable price has been a public policy goal and, today, it is largely an achieved reality. Arguably, the undifferentiated voice telephony service of past decades generally met the needs of households for social and emergency use and the economic needs of businesses, both at a domestic and international level.

Telecommunications—like other utilities such as gas, electricity and water—once constituted a single, homogeneous service. In the absence of other choices, consumer demand was also homogeneous and largely predictable. In such an environment, the monopoly supplier could plan investment for known demand, supply essentially a single service and set prices to recover long-run costs. Uneconomic services were subsidised by profitable ones and the standard voice service, along with its price, was entrenched in the regulatory framework.

That world has changed dramatically and is still changing.

First, the technologies have grown more diverse. Two in particular have been the source of profound change: mobile telephony (both terrestrial wireless and, more recently, satellite) and data technologies (of which the protocols underpinning the Internet are the outstanding examples). At the same time, the unit cost of supply has been falling.

Second, with the progressive liberalisation of the Australian telecommunications industry leading to open competition, there is a growing diversity of service providers. Where the impact of competition has been strongest, the declining costs of supply have increasingly been passed on to consumers in the form of lower prices. Faced with competitive prices, the capacity for any telecommunications carrier to maintain prices substantially above costs has become less and less tenable. Therefore, the capacity to maintain uniform pricing supply using cross-subsidies is being continuously eroded.<sup>1</sup> This diversity of supply is not, however, uniform. Australia has a series of different telecommunications markets, exhibiting varying competitive features, from full competition at one end of the spectrum to de facto monopoly characteristics at the other.

Third, the past decade has witnessed an ever-expanding choice of service provision, products and price packages. This diversity extends across corporate and residential consumer markets, though it is perhaps strongest at the corporate end in relation to fixed network services. For mobile services, the diversity of supply and choice is similar for both residential and business.

Fourth, consumers too are displaying increasing diversity and volatility in what services they are demanding. The predictability of demand that typified the old world is increasingly absent from the new. This, in turn, has implications for investment planning and supply.

Underlying many of these developments is a fundamental shift in the nature of communications. As the National Bandwidth Inquiry report noted, a paradigm shift is underway from a primarily voice-based communications system to a data-based system:

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<sup>1</sup> The current form of this model is the Universal Service Obligation (USO) funded through an industry levy.

*The spread of business data networks and the burgeoning growth of the Internet, especially in the last five years, have seen digital data traffic rising to levels equal to, or nearly equal to, voice.<sup>2</sup>*

At the same time, and partly as a result, the telecommunications, data and broadcasting industries are converging. We are moving to a world in which a plethora of different content services (such as voice, data, radio, television and other new applications) can in principle be delivered by a diversity of suppliers, on any number of technology platforms.

The telecommunications sector's legacy monopoly provision of a homogeneous (voice telephone) service, underpinned and reinforced by regulation is, therefore, breaking down. Australia is currently in a transitional phase: somewhere between the simplicity, predictability and homogeneity of the legacy world and a fully-fledged, highly competitive data world.

## INTERNATIONALISATION

These developments are not confined to Australia. The growth of the global information economy and, more recently, the burgeoning growth of online commerce have significantly changed the structure of the global telecommunications sector. The rigid systems that governed international telecommunications transactions are eroding—as is the effective shelter that protected national providers from international competition. New global telecommunications providers are emerging to meet the needs of multinational customers as well as market needs which cross borders.

Of equal importance, are the content providers such as multimedia firms and Internet hosting and 'portal' companies<sup>3</sup> that rely on competitively priced high bandwidth to supply services. Such companies tend to be very mobile internationally. If the costs of bandwidth in Australia are considered to be too high then international relocation of hosting/server facilities, or even physical relocation of the whole business, are available options.

For Australia, this increasing globalisation represents both an opportunity and a threat. Australia's ability to participate in the international telecommunications, commerce and information economies is enhanced. Our ability to fund the massive investments needed to retain a leading position in the information economy is assisted by the opportunities to encourage international investment. The barriers of the past that are disappearing, however, also effectively sheltered our domestic telecommunications sector. Australia remains a relatively small market outside the major technology regions of North America, Europe and North Asia. New challenges will include the need to maximise the competitiveness of the telecommunications sector to encourage the continued growth of those firms that depend on communications and to encourage continued sector investment.

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2 Australian Information Economy Advisory Council (AIEAC), *National Bandwidth Inquiry: Report of the Australian Information Economy Advisory Council*, Canberra, December 1999, p.10. Much of the following discussion draws on the National Bandwidth Inquiry report at Chapters 2 and 3.

3 Websites that constitute starting pages or major entry-points to the World Wide Web are known as 'portals'.

## THE ROLE OF GOVERNMENT

Recognising these developments, the Commonwealth, State and Territory governments have been actively promoting community and business participation in the information economy for a number of years. The vision of a world-class infrastructure for the information economy was spelt out in the Commonwealth Government's strategic framework report:

1. *High communications bandwidth, widely available in a cost effective way, and able to support advanced applications for the information economy.*
2. *Access by all Australians to this capability wherever they live or carry on business.*
3. *The availability of a wide range of cultural, business, educational and social services and applications which meet the needs of the general public, the business community, and groups with special needs such as people with disabilities.*<sup>4</sup>

Other governments have expressed the importance of telecommunications.

**Multimedia Victoria:**

*Globally, electronic commerce is fast becoming a vital tool for business in remaining world competitive and opening new markets; not only in geographic terms, but in terms of creating new products and services.... We believe that the development of Victoria as a world class electronic trading hub is critical if we are to grow our role as a global trading centre.*<sup>5</sup>

**Northern Territory Government:**

*Access to reliable telecommunications is about enabling people to communicate with each other, creating jobs, doing business and creating new opportunities for business and community growth.*<sup>6</sup>

**Queensland Government:**

*A key feature of the information age is connectedness, whether it is between business and consumers, government and citizens, or rural communities and urban communities. With connectedness comes interdependence.*<sup>7</sup>

**Government of Western Australia:**

*The equitable delivery of basic services and associated infrastructure together with communications and transport networks will reinforce the social, cultural, economic and environmental bonds delivering positive outcomes for regional, rural and remote communities and the State as a whole.*<sup>8</sup>

Such statements and goals set very high benchmarks for governments and for the community as a whole. At the same time, governments have fostered the growth of the online

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4 National Office for the Information Economy, *A Strategic Framework for the Information Economy: Identifying Priorities for Action*, January 1999, p. 20.

5 Multimedia Victoria, [www.mmv.gov.au](http://www.mmv.gov.au).

6 Northern Territory Government, submission, p. 13.

7 Queensland Government, [www.qld.gov.au](http://www.qld.gov.au).

8 Government of Western Australia, *Regional Development Vision*, [www.wa.gov.au](http://www.wa.gov.au).

environment, by promoting e-commerce, raising business and community expectations, and fostering participation through the increasing delivery of government services online. In setting these objectives, governments are both seeking to influence community use of communication services and to establish mechanisms to ensure that evolving demand is met by suppliers of those services.

## IN BUSINESS

Advances in telecommunications capabilities have already changed the way in which many sectors of the wider economy operate—not least of which are the health, education and banking sectors.

The emerging online environment creates new global business opportunities and new ways of doing business. Increasingly, it is the conduit for managing relationships with upstream suppliers and downstream customers. Businesses are restructuring to exploit the efficiency potential of the online world—not only large corporations, but small to medium sized businesses and across the farming sector.

Even for many small businesses with very local market operations, communications technology advances have had their impact. Tradespersons, for example, were amongst the first to use mobile phones and now regard them as an indispensable tool.

## IN OUR DAILY LIVES

The implications of these changes in the telecommunications market are equally important for Australians as individuals. The basic fixed telephone may still be the core service underpinning telecommunications needs, but the take-up of mobile phones and Internet services in the residential market has been significant. In addition, the advent of the Internet and to a lesser extent the facsimile, has led growing numbers of households to have multiple fixed telephone lines.

Until perhaps a decade ago, residential telephone access was seen as a substantial expense. Families tended to be circumspect about making calls and tended to keep long distance calls to a minimum.

Today, communications services play a much wider role. They are not only more extensively used for social and business purposes, but are increasingly becoming part of a wider area of discretionary expenditure. For example, Internet chat rooms, online games and the growing range of mobile data services, such as short messaging services are an alternative to other entertainment services.

Moreover, many areas are still in the relatively early stages of product and even market development. Few would confidently venture to predict the services which will characterise the communications sector in five or ten years time. In a world operating on 'Internet time', the uncertainties of new markets are exacerbated.

The overall picture which emerges is thus of increasingly diverse supply and demand in a more competitive and changeable environment. While some of the benefits of this environment have flowed through to consumers, the picture for regional, rural and remote Australia as well as particular groups of consumers is more ambiguous.

## ACHIEVING NATIONAL BENEFITS

An increased reliance on telecommunications globally for business and individuals has greater implications for those who are disadvantaged in their ability to participate in these developments.

Like most developed countries, Australia has a long history of universal service policy. Over a period of many decades the monopoly telephone service provider progressively extended telephone access to all. With the rapid development of the information economy, Australia cannot accept a similar timeframe for the progressive availability of more advanced communications services.

The rapid diffusion of new services and capabilities is vitally important for the economic development and continued competitiveness of regional, rural and remote businesses and communities. They also hold the potential to complement, enhance or replace traditional delivery mechanisms in areas such as education, finance or government services. (This is particularly important where those traditional mechanisms have been withdrawn or, in the most remote parts of Australia, never existed.)

Access to advanced telecommunications services, just like access to other infrastructure services, has the potential to assist in encouraging regional Australians to remain in regional Australia.

*I think in our areas there's been a large drift of population away from the farming areas and we're very concerned about any disincentives that will accentuate that problem.*

*The high costs of telephone and Internet in our area, we feel, are a real disincentive... [I]n isolated areas people need to keep in contact and there's a social value there as well as personal... and with more farm business going online, banking, also commodity price and trading, weather forecasts, we cannot afford to be disadvantaged compared to our competitors.*

*Also, there are many tertiary courses going online and we feel that because of the long distance to Esperance that could be made use of by younger people to help them get a better education.<sup>9</sup>*

Just as the online environment presents threats and opportunities for Australian business in a globally competitive world, similar threats co-exist with the opportunities for regional Australia. Regional businesses will increasingly be exposed to greater levels of competition as the past shelters presented by distance are increasingly ineffective in an online world.

*Most importantly is, as we go into this Internet-based community, the businesses that are online and are able to take orders and the rural areas that are able to promote their products and themselves are the ones that are going to survive. What we need in rural Australia is community portals, which are basically a little local area which highlights all the activities and interests in that area and keeps the people doing their shopping and their trading within their area online, because*

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<sup>9</sup> Ian Longmire, Kalgoorlie roundtable meeting, 6 June 2000.

*if you don't have that, you're going to have everybody shopping in the metropolitan areas or even overseas, because people will do a search engine and go straight to whoever is the one getting the most hits, and that's the way the search engines work.*

*So unless we have community portals which can confine trading to the local areas, we are going to destroy all our rural and regional industry, and even the agricultural products will start to suffer.<sup>10</sup>*

The factors influencing participation in the information economy are not limited to those caused by delayed availability of new services in parts of the country. Analysis both in Australia and overseas suggests that income, age and education also play a key role in determining whether a household is likely to take up access to advanced telecommunications services. Moreover, telecommunications and the Internet are seen by many as at least partial solutions to social participation for people with disabilities, where the capacity to be online may be a main avenue for social interaction. Greater attention should be given to these demand side factors in addition to the current policy focus on the performance of the supply side of the industry.

## POLICY IMPLICATIONS

Governments today are both seeking to influence this developing communications world and to establish policy mechanisms to ensure Australia's telecommunications industry meets the challenge.

Australia faces a future of cheap and diverse communications services in an increasingly global, information-intensive economy if the transition is appropriately managed. However, just as the communications world is changing, it would be unrealistic to believe that the policy and regulatory tools which served us well in the past will continue to do so in the future.

The telecommunications sector itself used to be effectively protected from international competition. Few global providers existed. Most telecommunications services were domestic and international services were controlled by complex and rigid agreements which limited competition. Telecommunications as a business input for the wider economy also remained relatively small. This is no longer the case. The Australian telecommunications sector today competes with globalised operators. For many businesses, particularly those at the vanguard of the developing information economy, their success—and their willingness to continue to operate from Australia—depends on the competitiveness of the telecommunications sector.

This poses a new challenge for telecommunications policy. In addressing real problems in the current environment—particularly in regional Australia—it is important that today's actions do not stifle tomorrow's growth. Our international competitiveness will increasingly rely on the telecommunications sector remaining at the forefront of technology and providing high quality services at the lowest commercial price. Removing past monopoly profits, however, also limits the potential to continue significant cross-subsidisation of non-commercial market activities.

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10 Gary Ford, Brisbane roundtable meeting, 19 June 2000.

Further adding to the complexity, telecommunications policy issues can no longer be isolated from wider issues such as education, health or regional economic development. The assessment of the costs and benefits to the community of policy strategies must consider ever wider interrelationships between all sectors.

Finally, the touchstones of ‘telephony world’ policy tools—a homogeneous product, relatively predictable demand and relatively stable technologies—have all but disappeared. With this loss of predictability comes greater risk of incorrect policy choices.

Nevertheless, the long-term costs to the community as a whole of disenfranchising those who are slowest to benefit from the information economy are also significant. It is in this challenging world that this Inquiry has been asked to consider the performance of the Australian telecommunications industry.

# CHAPTER 3

## TELECOMMUNICATIONS MARKET STRUCTURE AND REGULATORY FRAMEWORKS



### SUMMARY

The telecommunications sector in Australia has undergone a process of liberalisation over the past twenty years. Historically, telecommunications services were provided by various monopoly organisations. In 1989, a separation of operational and regulatory functions occurred with the establishment of the Australian Telecommunications Authority. A phased approach to the introduction of open competition was implemented during the early 1990s. The *Telecommunications Act 1997* provided for an open and pro-competitive telecommunications environment.

In this new environment, a range of bodies, including the Australian Communications Authority, the Australian Competition and Consumer Commission, the Telecommunications Industry Ombudsman and the Australian Communications Industry Forum, have roles in regulating and monitoring the industry. Specific legislative consumer protection measures include the Universal Service Obligation, the Digital Data Service Obligation and the Customer Service Guarantee. Special telecommunications-specific competition regulation arrangements apply, in addition to general trade practices law.

Market liberalisation and regulatory change have encouraged the entry of new telecommunications service providers, resulting in differing market conditions within metropolitan, regional, rural and remote Australia.



# LIBERALISATION OF THE TELECOMMUNICATIONS SECTOR

## MONOPOLY HISTORY

The Commonwealth Government assumed responsibility for telecommunications services in Australia upon Federation in 1901. Until the introduction of limited competition in the late 1980s, telecommunications services were provided by various monopoly organisations. Operational and regulatory functions for all telecommunications services were the responsibility of the Postmaster-General's Department (PMG) until 1975, when those functions moved to the newly created Telecom Australia. Telecom became the monopoly telecommunications carrier of domestic services within Australia with exclusive rights to install, maintain and operate the network and supply basic services. Telecom was also the regulator in customer equipment, private networks and value-added services. The Overseas Telecommunications Commission (OTC) was established in 1946 with responsibility for provision of international telecommunications services.

Throughout the period until 1975, a major driver of telecommunications policy was the extension of the network to enable access by greater numbers of Australians.

In 1981 the Government established an additional publicly-owned carrier, AUSSAT, to operate a domestic satellite system. AUSSAT commenced operations in 1985.

There was, however, growing pressure for changes to the industry structure and regulatory frameworks during the 1980s, in line with increasing appreciation of the benefits of competition. Competition was expanded in stages but was limited by Telecom's continuing regulatory role, including approval of customer equipment.

## SEPARATION OF POLICY, REGULATORY AND OPERATIONAL ROLES

In May 1988 the Government announced directions for restructuring the regulatory environment for the telecommunications industry and operations of the Government-owned carriers. The objective was a more efficient and responsive telecommunications industry, capable of successful commercial operation in Australia and overseas, while continuing to serve important social objectives with basic telephone services. The reforms were implemented in the *Telecommunications Act 1989* and related legislation.

As part of the major reforms:

- ▶ the basic monopolies of Telecom, OTC and AUSSAT were retained; and
- ▶ competition was permitted in the provision of value-added network services and customer premises cabling, and in the supply, installation and maintenance of customer premises equipment.

Telecom was subjected to a range of reforms designed to foster a more commercial focus, and provide greater operational freedom, management independence and accountability.

The operational and regulatory functions of Telecom were separated when the Australian Telecommunications Authority (AUSTEL) was established in July 1989. AUSTEL operated as an independent industry-specific regulator with responsibility, among other things, for protecting the carrier's exclusive rights, protecting competitors from unfair carrier practices, protecting consumers' interests and administering price control and universal service arrangements.

The Government introduced a form of light-handed pricing regulation on a range of Telecom's services.

Despite these important but limited changes, there was continuing pressure for reform.

## NETWORK DUOPOLY

In 1990 the Government announced further reforms of the structure and ownership of telecommunications networks. A phased approach was adopted for the transition from a monopoly provider to open competition in basic services. A general carrier duopoly was established as an interim measure to foster competition. The second carrier was given sufficient time (and a relatively stable and predictable environment) within which to establish itself before the advent of full competition from July 1997.

The goal was to foster a globally competitive telecommunications industry by introducing sustainable network competition, while ensuring that the Government's social goals and industry development objectives continued to be met. The reforms included regulatory measures designed to ensure that the incumbent carrier, Telecom, did not misuse its market power.

The strategy was implemented in 1991 and 1992 and given effect through the *Telecommunications Act 1991* and associated legislation. The most important components of the strategy were:

- ▶ merging Telecom and OTC to become Telstra Corporation;
- ▶ licensing Optus (now Cable and Wireless Optus), after a competitive tender process, as a private sector national facilities-based network competitor, based in part initially on the national satellite service through the purchase of AUSSAT;
- ▶ fixing the period of facilities-based duopoly to end in 1997;
- ▶ licensing three public mobile telecommunications service operators (Telstra, Optus and Vodafone);
- ▶ mandating open competition in the resale of telecommunications capacity and public access cordless telecommunications services; and
- ▶ giving AUSTEL a stronger mandate to promote competition and protect consumers' interests. These included setting carrier service quality standards and monitoring performance, monitoring and reporting on price controls and competitive safeguards, and enforcing the Universal Service Obligation (USO) and carrier licence conditions covering a range of consumer safeguards.

The USO remained a cornerstone of the social policy framework in telecommunications and Telstra continued as the designated universal service provider across Australia. However, with the introduction of network competition, it was not considered appropriate for Telstra alone to meet the costs of social obligations. Telstra was therefore compensated by other carriers (Optus and Vodafone) for a share of the losses incurred in meeting the USO.

## OPEN ENTRY FROM 1 JULY 1997

The *Telecommunications Act 1997* (Telecommunications Act) and the related package of legislation came into effect on 1 July 1997. The main policy objective of the legislative reform package was to provide a regulatory environment to promote the long-term interests of all users of telecommunications services, and the efficiency and international competitiveness of the telecommunications industry.

Regulation of telecommunications was brought more closely into line with general competition law as governed by the provisions of the *Trade Practices Act 1974*. The Australian Competition and Consumer Commission (ACCC) assumed responsibility for competition and economic regulation of telecommunications, which passed from AUSTEL, the former industry-specific regulator.

The reforms also inserted telecommunications-specific provisions into the Trade Practices Act to deal with anti-competitive conduct and to establish an access regime governing the supply of services between carriers and service providers.<sup>1</sup>

In keeping with the broad philosophy of competition policy, industry self-regulation was encouraged, particularly in technical regulation and through codes of practice. The Australian Communications Industry Forum is the principal body responsible for developing and administering these codes. Legislative safety-nets such as the USO and Customer Service Guarantee (CSG), also support the market and provide consumer safeguards.

The legislation provides for a pro-competitive framework which promotes user choice. It imposes only minimal restrictions on the type of technology used and places no restrictions on entry to any telecommunications service market.

Consequently, there is no practical limit on the number of carrier licences which may be issued and any corporation or public body may apply for a licence. Once licensed as a carrier, industry operators are free to pursue whatever business strategy they choose.

Licence conditions oblige carriers to meet a number of specified requirements including a contribution towards the cost of providing universal service, fulfilment of industry development plans and compliance with the telecommunications access regime.

It is not necessary to have a carrier licence to provide the public with carriage or content services. Providers of these services are not subject to any licensing requirements, but must comply with legislated rules, such as consumer protections.

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<sup>1</sup> Part XIB supplemented the Act's existing powers to deal with anti-competitive conduct, while Part XIC established an access regime.

## REGULATORY BODIES

### THE AUSTRALIAN COMMUNICATIONS AUTHORITY (ACA)

The ACA was established as a Commonwealth statutory authority on 1 July 1997 under the *Australian Communications Authority Act 1997*. It has general powers to carry out functions under this Act, as well as specific powers under legislation it administers. The ACA regulates the Australian communications industry under the *Telecommunications Act*, the *Radiocommunications Act 1992*, the *Telecommunications (Consumer Protection and Service Standards) Act 1999* and a range of other related legislation. The ACA's specific functions include:

- ▶ encouraging industry self-regulation through codes of practice;
- ▶ regulation of service providers;
- ▶ annual and quarterly reporting of the performance of carriage service providers with reference to consumer satisfaction, consumer benefits and quality of service;
- ▶ overseeing the fulfilment of the USO;
- ▶ developing and enforcing consumer safeguards, including setting and implementing the CSG Standard;
- ▶ ensuring appropriate membership or exemption from the Telecommunications Ombudsman Scheme by all carriage service providers; and
- ▶ determining and enforcing mandatory industry standards where necessary.

The ACA is also required to monitor and report annually to the Minister on service performance, with particular reference to consumer satisfaction, consumer benefits and quality of service.<sup>2</sup>

### THE AUSTRALIAN COMPETITION AND CONSUMER COMMISSION (ACCC)

The ACCC is an independent Commonwealth statutory authority which has prime responsibility for administering competition and economic regulation of telecommunications. Its major functions are:

- ▶ administering the telecommunications-specific competitive safeguards regime under Part XIB of the *Trade Practices Act*;
- ▶ administering the telecommunications-specific regime under Part XIC of the *Trade Practices Act* for facilitating access to the networks of carriers. This includes 'declaring' services for access, approving access codes, approving access undertakings, arbitrating disputes for declared services and registering access agreements; and
- ▶ administering other legislative provisions in the *Telecommunications Act* and other related legislation, including price control of Telstra's retail services and number portability.<sup>3</sup>

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<sup>2</sup> Section 105 of the *Telecommunications Act*.

<sup>3</sup> [www.accc.gov.au](http://www.accc.gov.au).

## TELECOMMUNICATIONS INDUSTRY OMBUDSMAN (TIO)

The TIO was established at the direction of the Commonwealth Government in 1993 to resolve disputes between telecommunications companies and residential and small business customers. The scheme was mandated under the *Telecommunications Act 1991*. In 1997 the TIO's jurisdiction was extended by legislation to include complaints about Internet service providers (ISPs). The TIO is independent of telecommunications companies, consumer groups and government, and is a free service to consumers.<sup>4</sup> The TIO is an industry-sponsored scheme, deriving its funding solely from members who pay fees for complaint resolution services. Under the Telecommunications (Consumer Protection and Service Standards) Act, all telecommunications carriers, telephone service providers and ISPs who supply a standard telephone service to residential or small business customers, a mobile telephone service or a service enabling Internet access, are obliged to join the TIO scheme.<sup>5</sup>

The TIO is an office of last resort. It may only take up a complaint if the customer has first tried to resolve it with their telephone company or ISP. However, if agreement cannot be reached the TIO has the authority to make determinations (up to the value of \$10 000) which are binding upon the relevant provider. It can also make recommendations up to the value of \$50 000. The TIO cannot take up a case if it is more than 12 months old (except in special circumstances) or if legal proceedings have commenced.

The TIO has the authority to investigate most of the service delivery issues raised by residential and small business customers. If a complaint is outside its jurisdiction, such as a matter covered by a mobile telephone service contract or a 'fair trading' issue, the TIO may refer the complainant to the ACCC or the ACA.

## AUSTRALIAN COMMUNICATIONS INDUSTRY FORUM (ACIF)

The ACIF was established by the telecommunications industry in 1997 to implement and manage self-regulation in Australia. ACIF seeks to promote the interests of consumers and the efficiency and competitiveness of the industry, primarily by developing standards and codes to support competition and protect consumers, and by encouraging compliance with these standards and codes.

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<sup>4</sup> [www.tio.com.au](http://www.tio.com.au).

<sup>5</sup> Telecommunications Industry Ombudsman, *Annual Report 1998–99*, pp. 12, 13.

## CONSUMER PROTECTIONS

The Telecommunications Act and the Telecommunications (Consumer Protection and Service Standards) Act place a number of obligations on the telecommunications industry in regard to consumers and the general community. These telecommunications-specific safeguards are in addition to general safeguards conferred under the Trade Practices Act, general fair trading legislation and customer rights under contract law.

The telecommunications-specific safeguards include the USO, retail price controls on various Telstra services, and CSG performance standards. Safeguards also extend to untimed local calls for voice and non-voice calls for residential customers, untimed local voice calls for business, emergency call services and defence requirements, privacy and itemised billing.

### UNIVERSAL SERVICE OBLIGATION

The current USO arrangements are set out in Part 2 of the Telecommunications (Consumer Protection and Service Standards) Act. The Act defines the USO as the obligation to ensure that all people in Australia, wherever they live or work, have reasonable access on an equitable basis, to the standard telephone service (including customer equipment), payphones and prescribed additional carriage services. A supporting obligation requires those services to be supplied on request.

The key elements of the universal service regime include:

- ▶ the specification of the USO and Digital Data Service Obligation (DDSO);
- ▶ the declaration of universal service providers (USPs) and digital data service providers (DDSPs). (Telstra is currently designated as the USP and the DDSP for all Australia. Cable and Wireless Optus (CWO) is a special DDSP for Western Australia);
- ▶ scope for regulation of universal service charges and digital data service charges; and
- ▶ the preparation of universal service plans and digital data service plans.

The standard telephone service required under the USO is a service for voice telephony. For a person with a disability, an equivalent service is required to be supplied in order to comply with the *Disability Discrimination Act 1992*.

### DIGITAL DATA SERVICE OBLIGATION (DDSO)

Access to high speed data services is guaranteed via the general and special DDSOs. The general digital data service is a service that provides data capability broadly comparable to that provided by a basic rate Integrated Services Digital Network (ISDN) service. The general DDSO is available to 96 per cent of the population upon request and is presently supplied via Telstra's On Ramp service.<sup>6</sup>

The special digital data service is a service that provides for the delivery of data to an end-user broadly comparable to 64 kbps supplied as part of a basic rate ISDN service. The special DDSO applies to the remaining four per cent of the population who do not have access to ISDN services, primarily those customers living more than four kilometres from a metropolitan exchange or six kilometres from a country exchange.

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6 Digital Data Service Obligation Fact Sheet, [www.dcita.gov.au](http://www.dcita.gov.au).

The special DDSO is supplied by Telstra (Australia-wide through Big Pond Advance) and will be supplied by CWO (in Western Australia) in 2001 via satellite downlink services. A subsidy of 50 per cent of the cost of necessary customer premises equipment, capped at \$765, is available to special DDSO customers.

The USO framework provides for the selection of multiple USPs in an area, and the selection of USPs by tender.

USPs are required to submit plans on how they will progressively fulfil the USO, with approved plans being made publicly available. Telstra's universal service plan was approved by the Minister for Communications, Information Technology and the Arts in May 1998. The Plan was subsequently reviewed by the ACA, which reported to the Minister in March 1999. A majority of the ACA's recommendations were accepted and Telstra has subsequently amended its plan following a direction from the Minister.

Telstra's digital data service plans for both the general and special digital data service areas were approved by the Minister in June 2000. The plans outline consumers' rights and Telstra's obligations to provide digital data services.

Part 2 of the Telecommunications (Consumer Protection and Service Standards) Act enables the Government to impose price controls on the standard telephone services and payphone services of any USP, as services provided under the USO. Currently, however, the Government imposes Telstra-specific price controls (on services comprising about two-thirds of Telstra's revenue) under Part 9 of that Act.

Losses incurred by universal service providers in the course of fulfilling the USO are shared amongst all participating carriers in proportion to their eligible revenue. Each carrier's contribution is calculated at the end of the financial year and carriers pay their contributions in one lump sum.<sup>7</sup>

## CUSTOMER SERVICE GUARANTEE (CSG)

The CSG was originally introduced on 1 January 1998, in accordance with provisions of the Telecommunications Act.

The CSG arrangements are provided for in Part 5 of the Telecommunications (Consumer Protection and Service Standards) Act, which gives the ACA powers to set standards in relation to:

- ▶ the making of arrangements with customers about the period taken to comply with requests to connect customers to specified kinds of telecommunications services;
- ▶ the periods that providers may offer to customers when making those arrangements;
- ▶ the compliance by providers with the terms of those arrangements;
- ▶ the period taken to comply with requests to rectify faults or service difficulties;
- ▶ the keeping of appointments to meet customers; and
- ▶ any other matter concerning the supply, or proposed supply, of a relevant service to a customer.

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<sup>7</sup> Legislation currently before Parliament would broaden the funding base by levying both carriers and carriage service providers earning more than a prescribed minimum level of telecommunications revenue.

The current standard is contained in the *Telecommunications (Customer Service Guarantee) Standard 2000*, which came into effect on 7 July 2000, following an extensive review of the existing standard by the ACA.

With the passage of the Telecommunications (Consumer Protection and Service Standards) Act, the following changes to the CSG framework were made:

- a requirement for phone companies to automatically pay CSG penalties to customers from 2 August 2000; and
- a power for the ACA to direct phone companies to take action to improve service quality, or face fines of up to \$10 million.

The new CSG Standard also gave effect to other changes:

- a reduction in the time telephone companies have to supply new phone connections in rural and remote areas, where there is infrastructure—initially from 40 to 30 days, and from July 2001, to 15 days;
- the removal of the option for all-day appointments—phone companies have to offer half day appointments, or appointments at a particular time;
- clarification of the application of the CSG to cover small businesses with five or less telephones lines;
- clarification that the CSG applies to second telephone lines used for facsimile or the Internet; and
- tightening of arrangements where phone companies claim exemption from the CSG.

Further detail on CSG timeframes and definitions of services to be provided can be found at Appendix C.

## COMPETITION REGULATION

The ACCC's power to regulate anti-competitive conduct includes the collection of information to monitor competition in the telecommunications industry. The ACCC can act quickly where it finds anti-competitive conduct occurring—and parties affected by that conduct can also take action against the person involved and recover damages.

To ensure that competitors understand its intentions, the ACCC has developed guidelines for exercising its powers to deal with anti-competitive conduct. The ACCC reports annually on competitive safeguards within the industry.

## THE ACCESS REGIME

An important feature of the telecommunications industry is that competitors inevitably must make use of each other's networks. This is because many communications services, including normal voice calls, require 'any-to-any' connectivity—the ability for any user of the service to contact any other user, regardless of the suppliers or network used. This 'any-to-any' feature requires that regulated access rights be established to prevent those owning and controlling networks from taking advantage of this powerful position.



The telecommunications access regime contained in Part XIC of the Trade Practices Act provides a framework for regulated access rights to be established for specific carriage services and related services. It also establishes mechanisms within which the terms and conditions of access can be determined. The access regime reduces the power of those owning or controlling essential infrastructure.

The access regime establishes access rights through the ‘declaration’ of services by the ACCC. The ACCC may declare services to be the subject of regulated access—either on the recommendation of the industry self-regulatory body (the Telecommunications Access Forum) or where, following a public inquiry, it is satisfied that such declaration would be in the long-term interests of end users of telecommunications services. Once a service is declared, carriers and carriage service providers supplying that service are (unless otherwise exempt) under an obligation to supply the declared service and specified ancillary services to requesting service providers.

Access providers must comply with their obligations on terms and conditions commercially agreed by the access provider and access seeker; as detailed in an access undertaking; or as determined by the ACCC through arbitration.

As the telecommunications industry is a complex, network-based industry, it is likely that in many areas, efficiency gains can be achieved by the industry itself negotiating (on a multilateral basis), standard terms and conditions for access to declared services. The access regime establishes a mechanism for industry to develop a code containing model terms and conditions for access to particular declared services. Once approved by the ACCC, those model terms and conditions may be adopted in an undertaking by individual carriers or carriage service providers who are, or will be, under an access obligation.

## REVIEW OF TELECOMMUNICATIONS-SPECIFIC COMPETITION REGULATION

Section 151CN of the Trade Practices Act requires the conduct of a review of Part XIB of the Act, to be arranged by 1 July 2000. This review is being conducted by the Productivity Commission following a reference from the Treasurer and covers not only Part XIB of the Act, but also Part XIC and the telecommunications-specific competition provisions of the Telecommunications Act.

The reference requires the Commission to examine and report by June 2001 on, among other things, the community and economic benefits and costs flowing from the above provisions and whether they should be amended or repealed. It also requires the Commission to have regard to the state of competition in the telecommunications market and the impact of new technologies and delivery platforms.

## MARKET CHARACTERISTICS

The progressive liberalisation of the Australian telecommunications market and successive regulatory frameworks supporting competition have resulted in the entry of many new service providers. Growth in the number of licensed carriers and service providers registered with the TIO since 30 June 1997 is shown in Table 3.1.

**TABLE 3.1: GROWTH IN NUMBERS OF CARRIERS AND SERVICE PROVIDERS**

Date	Carriers	Telephone Service Providers (TSPs)	Internet Service Providers (ISPs)	Both TSPs and ISPs	Total
30 June 1997	4	16 <sup>8</sup>			20
30 June 1998	15	60	460 <sup>9</sup>		535
30 June 1999	24	76	751	15	866
12 September 2000	49	71	865	42	1024

Source: TIO – Inquiry communication.

More carriers were licensed from January to July 2000 than in any previous half-year period since July 1997, and it is likely that licences issued from July to December 2000 will exceed this number again.<sup>10</sup>

Prior to the introduction of open competition in July 1997, the legislated fixed network duopoly and mobile network triopoly largely limited growth in new industry participants to resellers. However, there was a significant growth in competition during this transition, as the Bureau of Transport and Communications Economics (BTCE) noted in January 1995:

*Optus has achieved significant market shares in several sectors and there is active rivalry between the carriers. The entry of the new carriers [Optus and Vodafone] has fundamentally changed the operation of the telecommunications industry. For many services, consumers can now choose between two or more suppliers. A range of product and service options is available. The structure of prices has changed significantly ...*<sup>11</sup>

Since 1997 Telstra's market share has continued to fall in fixed telephony services, such as basic access and local, long distance and international calls.<sup>12</sup> Continuing reduction in Telstra's market share and an increase in the number of market participants has led to a less concentrated, and more competitive, telecommunications industry.

8 Registration of Telephone Service Providers with the TIO was voluntary at this time.

9 At 30 June 1998, non-carrier members of the TIO were classified as either telephone service providers or Internet service providers, according to their main activity.

10 Paul Best, *www.fairfax.com.au/communications/*, 1 August 2000, reporting comment by Frances Wood of the Australian Communications Authority.

11 BTCE, *Telecommunications in Australia, Report 87*, January 1995, pp. 127, 128.

12 Telstra, *Annual Report 1999*, *www.telstra.com.au/ar99/*, p. 69.

It is no longer accurate to speak of a single, homogeneous, telecommunications market. The current telecommunications landscape is complex, and can be characterised as a series of matrices in which the effects of geography and population (metropolitan, rural and remote markets) may be overlaid with demand for specific services (mobile telephony and Internet markets).

The current state of Australian telecommunications markets can be defined in terms of their contestability.

The market for mobile telecommunications services is contested in most regions of Australia—more intensely where terrestrial coverage is available.

In fixed services, all Australians have access to alternative providers of some services, such as local and long distance calls supplied over the Telstra network.

In terms of infrastructure competition, markets in large metropolitan areas are highly contestable. These include the capital cities and large conurbations like Newcastle-Sydney-Wollongong, and Brisbane-Gold Coast. A number of companies now compete in both residential and business markets. The central business districts can be characterised as even more competitive, especially with the dominance of the information technology and financial services industries, with a high demand for specialised telecommunications services. Strong competition has also developed on trunk routes between the major population centres.

Fixed telecommunications services in larger regional centres, such as Dubbo, Albury/Wodonga, or Toowoomba, can also be characterised as contestable. Beyond these larger regional centres competition is slow to emerge, or has not yet developed, reflecting the higher costs of providing services in areas of lower population density. The Productivity Commission recently concluded that average line costs in low density areas of Australia (less than about two lines per square kilometre) are between six and ten times the average cost per line in the rest of Australia.<sup>13</sup> Over time, the advent of more affordable satellite services and contestability in USO arrangements may lead to increased competition in remote areas.

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<sup>13</sup> Productivity Commission, *Population Distribution and Telecommunications Costs, Staff Research Paper*, August 2000, p. ix.

## CHAPTER 4

# TELECOMMUNICATIONS NEEDS



### SUMMARY

There is a great diversity in the telecommunications needs of Australians.

Access to a standard telephone service is very important for Australians at home and at work:

- ▶ almost everyone needs a telephone at home, especially people who are physically or geographically isolated;
- ▶ public telephones are necessary, especially for people on low incomes, many remote Indigenous communities, and those without mobile phones;
- ▶ all businesses and government organisations need a telephone service and most need a fax service; and
- ▶ special equipment and services are vital for people with disabilities.

Mobile phone usage continues to grow rapidly:

- ▶ mobile phones are a prominent telecommunications tool for many, although not all, Australians; and
- ▶ mobile phones are important for most businesses and critical to some owner-operated businesses.

Internet access continues to grow steadily:

- ▶ Internet access in the home environment is of varying, although growing, importance and is particularly useful for households with students; and
- ▶ Internet connection is vital to most businesses and government organisations, with variation depending on size and industry sector.

High speed data services are necessary for some organisations:

- ▶ data services are needed by all big businesses, corporations, government departments and by some specialist smaller businesses.

## DEFINING TELECOMMUNICATIONS NEEDS

The Inquiry's terms of reference require it to consider 'the extent to which Telstra and other carriers and service providers are addressing both the basic and advanced telecommunications needs of all Australians, regardless of where they live.'

Assessment of the telecommunications 'needs' of Australians is open to interpretation. It is tempting to equate Australians' telecommunications needs with the minimum level of essential services described in the Universal Service Obligation (USO).<sup>1</sup> However, the USO concept of an individual's need for the minimum level of essential services is only one aspect of the full range of telecommunications needs.

## VARIATION IN TELECOMMUNICATIONS NEEDS

Telecommunications requirements have become more extensive for most users and more varied between different types of user, resulting in a complex and diverse matrix of requirements—stimulated by supply and demand factors.

Although there is no objective test of necessity and individuals have differing views of their needs for particular services, some drivers of demand are identifiable and can indicate degrees of service need. For example, access to the Internet has become increasingly important for education purposes, so the presence of children in a household would suggest a greater need for Internet services. Similarly, the growth of electronic commerce would indicate that businesses require more sophisticated data services.

Australians living in remote areas need telecommunications services to offset the social effects of isolation, as a stimulant to the local economy, and as a means of accessing other services such as education, business information and banking:

*If you live in a metropolitan area... you've got a daily mail service, you've got face-to-face access with your school, with your doctor, with people that are providing you with goods and services from both public and private sector [so you have advantages] compared with someone in [a] remote area who doesn't have any of those things ... [T]he need of telecommunications for that remote person assumes an enormous importance...<sup>2</sup>*

Broad demand drivers are overlaid by preferences, some of which are predictable. Older Australians are less likely to adopt advanced telecommunications services than younger Australians. Remote Indigenous communities have a high reliance on payphones, while the urban youth market has a preference for mobile phones.

In addition to socio-demographic and cultural influences, individual preference accounts for even greater variation. Some people place a higher value on new telecommunications services, absorbing them into their lives to the point that they become commonplace and expected, while others may not want those same services at all.

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1 The explanatory memorandum to the Telecommunications (Consumer Protection and Service Standards) Bill 1998 states that 'the USO's fundamental purpose is to safeguard access to a minimum level of essential telecommunications services for all persons in Australia ... [to support their] effective participation in Australian society,' p. 26.

2 Lindsay MacDonald, Longreach roundtable meeting, 20 June 2000.

All in all, the wide variety of demand drivers result in a great diversity of telecommunications needs among Australians, and any broad definition of needs will, therefore, be unavoidably simplistic.

#### FINDING

There is a great diversity in the telecommunications needs of Australians.

## BARRIERS TO MEETING TELECOMMUNICATIONS NEEDS

While demand for particular services is frequently measured, it is also important to take account of unmet demand—people who want the service but cannot get it, as distinct from people who do not want the service at all.

Both supply and demand factors contribute, often simultaneously, to unmet demand. On the supply side, service availability can be a problem. For example, in rural and remote Australia terrestrial telecommunications infrastructure is often sparse and technically limited. On the demand side, socio-economic factors—such as income, education levels, employment status and type, language and cultural background, age, gender and disability—can be a barrier.<sup>3</sup> Where both factors are not optimal, such as in rural and remote Australia, the impediments to meeting demand can be particularly pronounced.

If the public policy objective of enabling and encouraging all Australians to participate in the information economy is to be met, then both supply and demand barriers to telecommunications services will need to be addressed.

The Inquiry recognises the great diversity and complexity of Australians' telecommunications needs. In order to assess the adequacy of the telecommunications services supplied by the industry, there is a need, therefore, to categorise the needs of consumers. Accordingly, the requirements of residential, business and government users have been categorised with variations identified where appropriate. Market surveys and user requirement analyses conducted for the Inquiry have assisted in the categorisation of users' telecommunications needs.<sup>4</sup>

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- 3 National Office of the Information Economy, 'Equitable Access Online,' [www.noie.gov.au/projects/access/online\\_access/index.htm](http://www.noie.gov.au/projects/access/online_access/index.htm). The National Centre for Social and Economic Modelling (NATSEM) explores these and other social and demographic barriers to Internet and mobile phone access in its recent report. (Otto Hellwig and Rachel Lloyd, *Sociodemographic Barriers to Utilisation and Participation in Telecommunications Services and their Regional Distribution: A Quantitative Analysis*, National Centre for Social and Economic Modelling, University of Canberra, August 2000).
  - 4 Research International Australia, *Australian Telecommunications Needs and Expectations*; Gibson Quai, *Assessment of Telecommunications Requirements for a Comprehensive Range of User Groups*. The consultants' reports can be found on the Inquiry website at [www.telinquiry.gov.au](http://www.telinquiry.gov.au).

# RESIDENTIAL TELECOMMUNICATIONS NEEDS

## FIXED TELEPHONE SERVICES

### HOME TELEPHONES

A fixed telephone service in the home is recognised under the USO as a basic, essential telecommunication need. The near universality of that need is borne out by the 96.8 per cent household penetration rate for fixed phones. The Inquiry's research affirmed the importance of the fixed telephone service with 78 per cent believing the telephone to be very important or critical.<sup>5</sup> Householders ranked telecommunications the third most important service, behind water and electricity.

It is taken for granted by most Australians that they have access to a telephone at home to make social and emergency calls. Email and mobile telephony are becoming more common, but the home phone remains the basic communication tool.

A reliable telephone is of even more significance to those who are isolated geographically or by disability, illness or infirmity. Such people are hindered in their ability to physically access services, or to use other options such as payphones or neighbours' phones.

*[A]n isolated person at home, say with a physical disability, or an aged person, relies heavily on [a telephone for] emergency calls, organising transport, social activities and so forth. Government policy is to encourage people to stay in their homes, so obviously telecommunications is very important in that respect.*<sup>6</sup>

Nevertheless, the very factor that makes telecommunications so important in the lives of people with disabilities, can limit their ability to access it. Disability can reduce people's access to work and thereby the affordability of equipment, connections and charges for home phone services. The Combined Pensioners and Superannuants' Association of Victoria contends in its submission that all elderly and disabled people need access to a telephone at home for emergency calls.<sup>7</sup>

Access to a reliable home phone is also important for those in rural and remote areas where alternative communication options are limited. The nearest neighbouring property may be many kilometres away and terrestrial mobile phone coverage may be patchy or non-existent.

For remote households with students, an effective telephone service is vital to meet education needs as core lessons are often received over the home phone:

*[T]here are 287 students whose core, compulsory years of schooling are relying on effective telecommunications, and these students have a right to take their place as fully informed and aware citizens ...*<sup>8</sup>

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5 Regional variation among people surveyed is: 81 per cent metropolitan; 77 per cent regional; 75 per cent rural and 87 per cent remote. (Research International, *Australian Telecommunications Needs and Expectations*, p. 25). Gibson Quai also rated the fixed telephone services as the most important telecommunications service for residential users (Gibson Quai, *Assessment of telecommunications requirements*, p. 27).

6 Gunela Astbrink, Telecommunications and Disability Consumer Representation (TEDICORE), Brisbane roundtable meeting, 19 June 2000.

7 Combined Pensioners and Superannuants' Association of Victoria, submission, p. 1.

8 Charleville School of Distance Education, submission, p. 4.

Many people across Australia also use the home phone to access commercial services. At May 2000, 51 per cent of the adult population used the telephone to pay bills or transfer funds.<sup>9</sup> The ease, speed and convenient hours of telephone banking contribute to the value people place on the telephone as a tool to make personal transactions.

## PUBLIC TELEPHONES

Access to public telephones is a legislated right under the USO and the Inquiry found a strong need for their continued availability. People most commonly use payphones to make calls while on the road without a mobile phone, or outside mobile phone coverage, and while on holiday.

Public telephones are important for households who do not have a home phone:

*Phone boxes in this town are an important part of this community. We have a very diverse community, in that we have some people who work for BHP and earn in excess of \$150 000 a year and we have other people who are on welfare benefits and can't afford a telephone in their home. We do have a lot of that—I believe our state housing percentage in the town is around about 30 per cent—so we have a lot of people who simply cannot afford a telephone. I've been fighting for phone boxes to go back in and it's taken a long, long time.*<sup>10</sup>

Public telephones are a particularly high priority within remote Indigenous communities—both as a means of sharing communication among several users and because the service is paid for as it is used. The Inquiry observed the central role of public telephones at the Mugarinya Community at Yandeyarra in the Pilbara region and heard from representatives of the Tanami Network during a visit to the Yuendumu Aboriginal Community in the Northern Territory:

*In most Tanami communities there are about two public phones available for use by ordinary community members—that's a ratio of about one phone for every 150–200 people.*<sup>11</sup>

Payphones usage would appear to be in decline—from 47 per cent of the population having used a payphone in 1998–99 to 36 per cent in 1999–2000.<sup>12</sup> The rapid adoption of mobile phones by Australians may explain the reduction in fixed telephone usage in areas with mobile coverage:

*The mobile phone is having an impact on other forms of telecommunications with 40 per cent of respondents reporting less public payphone use, and 23 per cent less use of the home fixed-line phone.*<sup>13</sup>

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9 Australian Bureau of Statistics, *Use of the Internet by Householders*, Australia, Cat. 8147.0, May 2000, p. 11. The statistics do not state the proportion using a home phone as opposed to a phone at their workplace.

10 Bob Neville, Bloodwood Tree Association and Town of Port Hedland (Council), Port Hedland roundtable meeting, 8 June 2000.

11 Tanami Network, submission, p. 1.

12 Australian Communications Authority, *Telecommunications Consumer Satisfaction Survey* (unpublished).

13 Andrew Funston and Kate MacNeil, *Mobile Matters: Young People and Mobile Phones*, Communications Law Centre, 1999, p. 51.



Despite the changing usage trends, the Inquiry found no evidence to suggest that the need for provision of public payphones has declined. Among those users who have a high reliance on payphones, there is unlikely to be any substantial drop in demand in the short to medium term.<sup>14</sup>

#### FINDINGS

**Access to a fixed home telephone is the single most important telecommunications service to Australian residents, especially to those people who are isolated due to geographical or physical constraints.**

**Access to public telephones is important to most Australians and is a particular priority for people on low incomes, many remote Indigenous communities and those without mobile phones.**

## ENHANCED CALL SERVICES AT HOME

The progressive digitisation of Australia's telephone network has enabled the delivery of enhanced services such as call waiting, call diversion and 'Messagebank.'

Research conducted for the Inquiry revealed that only 19 per cent considered enhanced call services to be very important or critical.<sup>15</sup> This relatively low level suggests that the need for such services is far from uniform:

*Some people may have a preference or put a higher weighting on some of the [enhanced] services ... or the mobility of those services or the preference for higher data ... so I think there's a need for customer choice and therefore any government regulation should only be concerned about minimum standards and not those that encompass all [services].<sup>16</sup>*

Enhanced call features are a useful addition to the standard telephone service but they appear not yet to be used or demanded at levels that indicate they are vital.

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14 It is recognised that technological changes and falling prices for alternative services could have an impact in the longer term.

15 21 per cent in metropolitan areas, 19 per cent in regional areas, 15 per cent in rural areas and 16 per cent in remote areas (Research International, *Australian Telecommunications Needs and Expectations*, p. 25).

16 Mark Needham, National Farmers' Federation, Melbourne roundtable meeting, 5 June 2000.

## SPECIAL PHONE SERVICES FOR PEOPLE WITH DISABILITIES

People with disabilities can require special equipment or services to enable them to use telecommunications effectively.

With the addition of special equipment, the telephone can deliver equivalent services to the deaf and hearing impaired. The importance of these services is recognised by their inclusion in the USO. The Deafness Council of New South Wales defined the various telecommunications requirements of the three main groups of hearing impaired:

- ▶ the 20 000 ‘signing deaf’—who have no hearing—rely on teletypewriters (TTYs) and faxes;
- ▶ the 95 000 severely deaf—who use a combination of auditory, visual (and sometimes tactile) communication—need volume-controlled telephones, TTYs and faxes; and
- ▶ the 500 000 moderately deaf hearing-aid wearers use standard telephone equipment, sometimes volume boosted, and can use Code Division Multiple Access (CDMA) mobile phones but not Global System for Mobiles (GSM) mobile technology due to acoustic interference.<sup>17</sup>

Short messaging services (SMS) on mobile phones are also of value to deaf and speech-impaired customers.<sup>18</sup>

People with vision impairment require access to adaptive equipment both at home and in the workplace. Such equipment may include computer-based telephone inquiry services and scanners that ‘read’ printed material and convert it to text on a computer screen and into synthetic speech.

The Inquiry found that equipment design is an important issue for people with disabilities of all types. Hands-free telephones are important for those suffering from loss of dexterity, while:

*blind people using canes are not aware of the presence of payphones in semi-open booths which have a cut-away design and walk into them. This is because their canes do not pick up any obstruction at the ground level and so their face can hit the side of the payphone booth without any warning.*<sup>19</sup>

### FINDING

**People with disabilities require access to special equipment, services and product information to enable them to make full use of telecommunications services.**

17 Deafness Council of New South Wales, submission, p. 4.

18 Cable and Wireless Optus, submission, p. 17.

19 TEDICORE, submission, p. 3.

## FACSIMILE AT HOME

Around 20 per cent of Australian households use facsimile machines.<sup>20</sup> On the other hand, Inquiry research indicated that current residential use of fax is around 11 per cent and small business use is 67 per cent. Household use of fax services by remote users at 22 per cent, is double that of other regions at 11 per cent for metropolitan and regional users and 13 per cent for rural users.<sup>21</sup> In areas where postal services may be infrequent, a fax is a relatively quick and cheap option.

Fax services have been in decline in residential markets since the late 1990s due to the growth in the use of email.<sup>22</sup> Usage largely corresponds to the presence of home offices and home-based farm businesses.

## INTERNET AT HOME

Australia is among the world leaders in accessing the Internet with 46 per cent of the adult population regularly online—28 per cent from home, 21 per cent from work and 23 per cent from elsewhere—through a neighbour, friend, relative, tertiary institution or library.<sup>23</sup>

Connection to the Internet at home continues to escalate rapidly—at May 2000, 33 per cent of all households (2.3 million) had access to the Internet.<sup>24</sup> The ABS reports that 37 per cent of households in metropolitan areas had access to the Internet at home compared to 26 per cent outside metropolitan areas.<sup>25</sup> The Inquiry found further variation in demand between metropolitan, regional, rural and remote users:

**TABLE 4.1: REGIONAL VARIATION IN DEMAND FOR INTERNET ACCESS**

	Metro	Regional	Rural	Remote	Total
Current Internet access	31%	30%	17%	13%	28%
Wanting Internet access (via dial up modem)	16%	11%	12%	13%	12%

Source: Research International Australia, *Australian Telecommunications Needs and Expectations*, September 2000, pp. 22, 23.

Although since 1998 the number of non-metropolitan households online has increased at a greater rate than metropolitan households, the current difference in access rates between metropolitan and other areas is expected to grow.<sup>26</sup>

20 ABS, *Use of the Internet*, p. 14.

21 Research International, *Australian Telecommunications Needs and Expectations*, p. 22.

22 Paul Budde Communications, *Australia—Facsimile, Unified Messaging*, August 2000, p. 1.

23 ABS, *Use of the Internet*, p. 8. National Office of the Information Economy (NOIE), *The Current State of Play: Australian and the Information Economy*, July 2000, p. 13, [www.noie.gov.au](http://www.noie.gov.au).

24 ABS, *Use of the Internet*, p. 3. It is projected that 71 per cent of adults will be connected at home in the next three years, up from 37 per cent in March 2000. (Hellwig and Lloyd, *Sociodemographic Barriers*, p. 4).

25 ABS, *Use of the Internet*, p. 3.

26 NOIE, *Current State of Play*, p. 4; Hellwig and Lloyd, *Sociodemographic Barriers*, p. 4.

Lower usage in rural and remote areas is likely to be a function of both supply and demand factors. The main supply barrier is infrastructure constraint—the inability to access the Internet at reasonable speeds through the terrestrial customer access network. This affects around five per cent of urban and provincial customers and 15 per cent of rural and remote customers.

Other research focussing on demand factors points to the barriers of low income, low education levels and advanced age on the take-up of the Internet.<sup>27</sup> The National Centre for Social and Economic Modelling points out that the proportion of people with post-secondary education is much lower in non-metropolitan areas, with the effects of low income felt most strongly in regional and rural towns. The report suggests that such socio-demographic factors are more significant barriers than geographical location.<sup>28</sup>

The value that households place on Internet connection varies. While some households may consider it imperative to have home Internet access for their school-aged children, others may not consider it either necessary or affordable. Some people choose to access government services or do online banking at home—others may perform the same functions physically or from work. Of those households that are online, the type of Internet activity varies considerably. While over 80 per cent of households use email and web searches, fewer households do research, information-gathering and online chat (24 to 34 per cent depending on topic), or online banking and games (18 per cent each).<sup>29</sup>

## ONLINE COMMUNICATION

While for many people the telephone remains the primary tool for social communication from home—after personal contact—the use of email and online focus and chat rooms are becoming increasingly prominent, especially among younger users. Email is the dominant online activity at 85 per cent with interactive online chat activity at 27 per cent.<sup>30</sup>

Communicating on the Internet reduces the disadvantages experienced by people with disabilities and, being text-based, is a particular asset to people with hearing impairment. Women With Disabilities Australia explains the needs and benefits of telecommunications for its constituency:

*Telecommunications play an integral role in reducing isolation, stress and fatigue as well as alleviating loneliness for women with disabilities. It increases their independence, reduces dependence and enables opportunities for education and employment. For many with disabilities, telecommunications allow them to have contact with family and friends, to pay their bills, to do their banking and shopping, to arrange their personal care, to organise transport, to undertake study, and to access information. Telecommunications are also of vital importance in*

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27 In May 2000, 51 per cent of households with an income above \$50,000 had home Internet access compared to 18 per cent of those with incomes under \$50,000; 46 per cent of households with children under 18 years had Internet access compared to 25 per cent of households without. At February 2000, 80 per cent of those with a Bachelor's degree had home Internet access compared with 28 per cent of those with a secondary qualification. (ABS, *Use of the Internet*, p. 3; NOIE, *Current State of Play*, p. 11).

28 Hellwig and Lloyd, *Sociodemographic Barriers*, p. 3.

29 Jupiter Communications, *Australia: Next-generation Access Services Rapidly Emerge Down Under*, volume 1, 2000, p. 12.

30 Jupiter Communications, *Australia: Next-generation Access Services*, p. 12.

*providing security and assisting with emergencies. Telecommunications enable women with disabilities to participate in, and take their rightful place in, their community.*<sup>31</sup>

## STUDENT USE

Information technology literacy is a core component of school curricula and is frequently supported at home by the 46 per cent of households with children that have Internet access. By contrast, the rate of connection is 25 per cent for households without children (at May 2000).<sup>32</sup> Most students access the Internet from a home computer using a 33.6 kilobits per second (kbps) modem.<sup>33</sup>

There is a strong correlation between home use of computers and the acquisition of advanced information technology skills, including Internet-related knowledge:

*Fifty-six per cent of all school students and 75 per cent of current primary students began using computers before Year 4. The study showed high levels of computer use outside school (85 per cent of all students). Some 50 per cent of students use a computer outside school every day or almost every day. The earlier they began using them, the more frequently they use them at a later age.*

*Although a substantial minority of students developed their advanced skills at school, most acquired them at home.*<sup>34</sup>

The most extensive student use of the Internet is research undertaken by post-graduate students. School and Technical and Further Education students use the Internet primarily for email and entertainment, followed by research.<sup>35</sup>

For students in remote areas, accessing email through the Internet is considered critical for student-teacher or lecturer communications:

*It starts really from preschool, and it continues right through until tertiary, and when you get into a university, some of the lecturers won't actually answer the telephone. If you can't email your lecturer to say what you want, you just don't get a return, you don't get a reply. It's just that important.*<sup>36</sup>

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31 Women With Disabilities Australia, submission, p. 2.

32 ABS, *Use of the Internet*, p. 3.

33 Gerry White, *Online Education Report*, education.au limited, October 1999, [www.edna.edu.au/EdNA](http://www.edna.edu.au/EdNA).

34 Department of Education, Training and Youth Affairs, *Special article—Real time: computers, change and schooling*, Canberra, 1999, pp. 3, 5, [www.abs.gov.au](http://www.abs.gov.au).

35 White, *Online Education Report*, [www.edna.edu.au/EdNA](http://www.edna.edu.au/EdNA).

36 Margaret Greenway, Isolated Children's Parents Association of Australia, Mount Isa roundtable, 22 June 2000.

## ACCESSING GOVERNMENT AND COMMERCIAL SERVICES

The number of Australians using the Internet to access government and commercial services is still low.

At May 2000 only eight per cent of the Australian population used the Internet to access government services, pay bills or transfer funds.<sup>37</sup> Nevertheless, ‘the number of adults using Internet banking has had the highest proportional growth ... of any banking channel.’<sup>38</sup> It is predicted that there will be huge growth in the number of people paying their bills online in the next few years.<sup>39</sup>

Six per cent of adult Australians also used the Internet for shopping in the 12 months to May 2000 with 33 per cent of those making only one transaction.<sup>40</sup> The figure rose to 14 per cent by mid-2000 with one in three people expected to shop online in the next year.<sup>41</sup>

Despite the predicted growth, business-to-consumer retail sales remain proportionately very low, with perceptions about credit card security a significant barrier to the take-up of Internet shopping.<sup>42</sup>

## HOME OFFICE

Many teleworkers and home business offices have a need for Internet access. At May 2000, six per cent of employed adults had an agreement with their employer to work from home on an ongoing basis, with 32 per cent of those accessing their employer’s computer systems via a modem.<sup>43</sup>

Connection to the Internet by farming businesses run from homesteads, while principally used to access information relating to the management of the farm, is also used for broader personal, educational and environmental (landcare) purposes.<sup>44</sup>

While many Australian businesses—including a large proportion in the farming sector—operate from home, the telecommunications needs of these businesses have more in common with non-home-based small businesses than with the needs of individuals in a residential context.

### FINDING

**Internet access in the home environment is of varying—although growing—importance to Australians. It is of most significance to households with students.**

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37 ABS, *Use of the Internet*, p. 11.

38 NOIE, *Current State of Play*, p. 32.

39 NOIE, *Current State of Play*, p. 33.

40 ABS, *Use of the Internet*, pp. 12, 13.

41 Red Sheriff data published in Jane Schulze, ‘Number of online shoppers jumps 600 per cent in three years,’ *The Age*, 11 July 2000, Business Section, p. 2. An Angus Reid Survey also places current levels of online shopping at 14 per cent in Australia (NOIE, *Current State of Play*, p. 29).

42 NOIE, *Current State of Play*, p. 28.

43 ABS, *Use of the Internet*, p. 11.

44 Jenny Da Rin and Jim Groves, *Demand for and Supply of Internet Content for Australian Farm Businesses*, 99/2, Rural Industries Research and Development Corporation (RIRDC), 1999, p. 4.

## HIGH BANDWIDTH DATA SERVICES AT HOME

High bandwidth and satellite data services are relatively new to the residential retail market thereby making assessment of the need for those services difficult.

Inquiry research showed that only three per cent of residential users wanted high speed Internet access via cable modem or satellite.<sup>45</sup> This low demand is reflected in the level of take-up of Telstra's Integrated Services Digital Network (ISDN) service—less than one per cent of Telstra's customers for this service are residential users.<sup>46</sup> However, carriers expect demand to escalate and are planning to roll out many more high bandwidth networks throughout Australia. Telstra predicts that by 2004–05 there will be over 1.5 million broadband service connections out of a total estimated 2.7 million or so services.<sup>47</sup>

Remote Indigenous communities, remote students and people with severe hearing disabilities have indicated the value they would place on high bandwidth video conferencing services in the future.<sup>48</sup> Increasing access to high bandwidth will also open up the market for video-streamed filmed entertainment. Once viewing quality is improved, downloading such material may become a standard means of accessing audiovisual entertainment.

Broadband and other data-intensive services have the real potential to change the way many residential consumers use their telecommunications services. Nevertheless, it is important not to confuse these prospects with current service needs.

In general, broadband data speeds are not commonly required for the existing levels of email, Internet banking, information services and web-browsing used in the home.

## MOBILE PHONES AND DATA FROM HOME

### MOBILE PHONES

At April 2000 there were nearly 8.5 million mobile phones in operation in Australia—half a million more than in December 1999.<sup>49</sup> The Australian market has grown by around one million new customers per year since 1994—except for 1995 when the expansion was close to two million.<sup>50</sup> The 8.5 million mobile phones (in April 2000) compares to around 10.6 million fixed telephone lines (in June 2000). On current growth, it is expected that mobile phone connections will significantly outstrip fixed home phone connections in the near future.<sup>51</sup>

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45 Geographical variation saw metropolitan and remote users having the greatest requirement with four per cent in metropolitan; three per cent in regional; one per cent in rural and five per cent in remote areas wanting high speed access (Research International, *Australian Telecommunications Needs and Expectations*, p. 23).

46 Telstra Corporation Limited, submission, pp. 53, 54.

47 Telstra, submission, p. 60.

48 ATSIIC has indicated that Indigenous communities have a preference for face-to-face conversations and would benefit from access to video conferencing or video telephony services (Peter Taylor and Iris Godfrey in Gibson Quai, *Assessment of Telecommunications Requirements* p. 86). Video services would also be of particularly high value in remote community settings for education and health purposes. Remote students would have a greater sense of class participation if some lessons and group activities were to be delivered by video conferencing rather than by voice alone. Video conferencing (at symmetrical data speeds allowing two-way high resolution images) offers great potential for people with severe hearing disabilities to communicate using sign language, lip reading and gesture (Australian Communications Exchange, submission, p. 3).

49 Australian Mobile Telecommunications Association, *More Australians are Becoming Mobile*, media release, 14 April 2000.

50 Budde Communication, *Wireless Markets in Australia 1999*, 3rd edition, p. 109.

51 Australian Communications Authority, *Telecommunications Performance Report 1998–1999*, p. 5.

Residential customers currently rate the mobile telephone as the second most important telecommunications service after fixed telephone services, as the Inquiry found:

*The Australian community has quickly and massively adopted mobile telephone services. As a consequence, they have become more and more dependent upon a mobile telephone service.*<sup>52</sup>

*I certainly believe that mobiles are seen to be part of the everyday life now ... I really believe that people would regard mobile phones as part of everyday communication equipment.*<sup>53</sup>

Mobile phone services are particularly firmly established in young people's lives. Contact with friends and family and security are the key motivators for young people getting a mobile phone, along with leaving the parental home or entering the workforce.<sup>54</sup>

The safety aspect was a constant theme—particularly in rural and remote areas:

*There are long stretches of lonely road out there ... and the lack of communication raises safety issues ... that affect the residents of Cape York and the visitors that come to that area.*<sup>55</sup>

*The school has gone to the expense of purchasing a satellite phone, and that's simply to address safety issues of students when they're out on camps, travelling to and from sporting excursions.*<sup>56</sup>

Remote Indigenous communities also value the portability of mobile communications although on the whole they find the cost of satellite mobile services unaffordable.<sup>57</sup>

The socio-demographic patterns for mobile phone usage are different from those for the Internet. While the rate of Internet connection increases with education and income, tertiary education decreases the likelihood of using mobile phones and income is of minor relevance. The most important drivers of mobile phone usage are age and region.<sup>58</sup>

The greatest take-up of mobile services is in metropolitan and regional centres with 43 per cent of household respondents having a mobile service. Rural areas at 32 per cent have somewhat lower but still significant mobile phone usage, while remote users at nine per cent have very low usage.<sup>59</sup> Given the strength of views expressed to the Inquiry regarding the utility of mobile phone services, this geographic variation in take-up would appear to be a result of the more limited availability of terrestrial service coverage in remote areas (and relatively recent introduction of satellite services) in combination with socio-demographic barriers.

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52 Australian Telecommunications Users Group, submission, p. 7.

53 Jim Leary, Broken Hill City Council, Broken Hill roundtable meeting, 6 July 2000.

54 Funston and MacNeill, *Mobile Matters*, p. 3.

55 Bob Sullivan, Cape York Peninsula Development Association, Cooktown roundtable meeting, 21 June 2000.

56 Laurie Shepherd, Cooktown State School, Cooktown roundtable meeting, 21 June 2000.

57 Taylor and Godfrey in Gibson Quai, *Assessment of Telecommunications Requirements*, p. 86.

58 Hellwig and Lloyd, *Sociodemographic Barriers*, pp. 29, 30.

59 Research International, *Australian Telecommunications Needs and Expectations*, p. 22.



## MOBILE DATA

Mobile phones for voice calls are likely to be transformed in the next few years by developing data capabilities. The Wireless Application Protocol (WAP) delivers voice and data services on a mobile handset. While WAP connections are expected to be no more than 100 000 by the end of 2000, improvements in data speeds and the expected price competition should lead to significantly stronger take-up.<sup>60</sup> Cable and Wireless Optus predicts that its mobile data services will generate 25 per cent of its mobile revenue by 2005 and 50 per cent by 2010.<sup>61</sup> Three streams of mobile data 'lifestyle' applications are likely to emerge—travel/location information, personal transactions, and social communication and entertainment.<sup>62</sup>

The spread of 'home zone pricing,' which at present is only offered in Sydney and Melbourne by service provider Hutchison, will also have an impact. This service provides fixed phone local call rates on a mobile phone when users are in their residential zone (not confined to the physical residence) transferring to mobile rates outside the zone. This development, and the maturation of WAP technology and services, will lead to a significant market shift in telephony services.

### FINDING

**Mobile phones are an important and prominent telecommunications tool for many, although not all, Australians.**

## BUSINESS TELECOMMUNICATIONS NEEDS

Telecommunications services are vital to the operations of business, particularly as they increasingly embrace e-commerce in order to make efficiency gains, reduce costs and improve competitiveness.<sup>63</sup> Internet-based commerce in Australia is expected to grow from \$61 million in 1997 to \$1.3 billion in 2001–02.<sup>64</sup>

Business size is the major determinant of the range and intensity of technology use—the larger the business, the greater the range and volume of telecommunications services used.<sup>65</sup> In a competitive market, large high-volume businesses often have the market power to ensure their telecommunications requirements are met, whereas medium and small businesses can lack the market leverage to obtain tailored products or pricing.

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60 Ramin Marzbani (*www.consult*) in Helene Zampetakis, 'The year the nation connected to the net,' *Australian Financial Review*, 19 July 2000, p. 5.

61 'The wonders of WAP,' Exchange, 11 August 2000, [www.3rdwave.com.au/Exchange/Excp/E12/E1231/exchange-EX.html](http://www.3rdwave.com.au/Exchange/Excp/E12/E1231/exchange-EX.html).

62 KPMG, *Market Segmentation for Mobile Internet*, [www.kpmg.com.au/mobileinternet/page4.html](http://www.kpmg.com.au/mobileinternet/page4.html).

63 E-commerce is the electronic communication, information exchange and transactions that occur from business-to-business and between businesses and their customers.

64 In the context of Australian expenditure of over \$550 billion and total transactions many times greater (National Office for the Information Economy (NOIE), *E-commerce—Beyond 2000*, Canberra, 2000, p. 4).

65 ABS, *Science and Technology Statistical Newsletter*, Bulletin No. 2, March 2000, p. 8, [www.abs.gov.au](http://www.abs.gov.au). In 1997–98, of the 978 000 Australian businesses (excluding agriculture, forestry and fishing), around 44 per cent were non-employing; 47 per cent had 1–9 employees; five per cent had 10–19 employees; two per cent had 20–99 employees; and less than one per cent had 100 or more employees.

The relationship between industry and use of technology is, however, more complex than one based on size alone. The electricity, gas and water supply industries are the most technologically intensive—although these utilities supply their own telecommunications network needs internally.<sup>66</sup> Property and business services are also large users of telecommunications and information technology services. Other industries are less consistent in their use of technology, reflecting industry-specific needs. For example, accommodation, cafes and restaurants are least likely to use computer-based technologies but have the second highest use of electronic banking and EFTPOS.<sup>67</sup>

The primary production sector is highly varied in structure and size—ranging from family businesses operating out of the homestead to large corporate structures—and is mixed in its use of telecommunications services.

## TELEPHONE AND FACSIMILE FOR BUSINESSES

Telephone and facsimile are base minimum services. Businesses have rated fixed telephone services as the most important telecommunications service and a failure of this service can have a dramatically detrimental business effect.<sup>68</sup>

Facsimile communications remain an important component of the business and office environment, although growth in business installations has been slowing during the late 1990s due to the increasing prevalence of email messaging. Nevertheless, outsourced or enhanced fax services continue to grow in volume by 20 to 25 per cent a year. From the late 1990s most Internet service providers and fax bureaus have added Internet fax services to their product offerings, although the impact has been minimal as yet.<sup>69</sup> Approximately 20 to 30 per cent of all international telephone calls are fax calls and around three to five billion pages are faxed in Australia per annum.<sup>70</sup>

Public telephones have little application in a business context, especially since mobile phones have become a common business tool. They tend to be used only as a stop-gap or safety measure for employees working away from the office or out of a mobile phone service area.

### FINDING

**Almost all businesses need fixed telephone services including a fax capability.**

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66 The electricity sector is exempt from an obligation to hold a telecommunications carrier licence, enabling them to install telecommunication networks without being subject to the telecommunications regulations obligations.

67 ABS, *Science and Technology Statistical Newsletter*, p. 8.

68 Research International, *Australian Telecommunications Needs and Expectations*, p. 25.

69 Paul Budde Communications, *Australia—Facsimile, Unified Messaging*, 10 August 2000, pp. 1, 2.

70 Paul Budde Communications, *Australia—Facsimile*, p. 3.

## MOBILE PHONES AND DATA FOR BUSINESSES

### MOBILE PHONES

Mobile phone usage is increasingly common in businesses of all sizes and plays an important role in the viability of many small businesses. Micro-businesses and tradespeople often place a high premium on mobile communications particularly where they do not employ staff at a fixed location to handle customer and supplier contact.

*Contractors use mobile services; that's a fundamental communications tool for them. Contractors ... want to be able to keep in contact with their office, find out where their other job is.<sup>71</sup>*

Research undertaken for the Inquiry has found that the take-up of mobile phones in the small business sector is significant, except in remote areas:

**TABLE 4.2: CURRENT USE OF MOBILE PHONES BY SMALL BUSINESSES**

	Metro	Regional	Rural	Remote	Total
Mobile phone connections	47%	60%	44%	13%	49%

Source: Research International Australia, *Australian Telecommunications Needs and Expectations*, September 2000, p. 22.

As with residential mobile use, this variation would appear to be more a result of the lack of terrestrial mobile coverage than of a lower requirement for mobile services.

*If you take the example of grain farmers at harvest, they need to know the market and price their grain as they deliver it, which means they need access to information. They can no longer sit on the header and send a truck to the silo to deliver the grain ... They have to be out there in the market trading. They need access to a mobile to do that. You can't drive a header and sit in your office at home talking on the landline.<sup>72</sup>*

Satellite mobile services have not yet captured a significant market in remote areas.

### MOBILE DATA

While mobile data is an emerging technology and currently has low usage in Australia, future convergence of mobile voice and Internet data services will have a major impact on business practices. It is predicted that within three years the majority of e-commerce transactions will originate or terminate on a wireless device.<sup>73</sup>

The shift to a global mobile online economy is expected to affect business-to-consumer interactions initially—predominantly through lifestyle applications. Professional applications for the banking, transport and wholesale and retail industries are still in their infancy.<sup>74</sup>

71 Ken Donahoe, Shire of Mt Marshall, West Australian video conference meeting, 7 June 2000.

72 Peter Walsh, Victorian Farmer's Federation, Melbourne roundtable meeting, 5 June 2000.

73 KPMG, *Creating the New World Wireless Operator*, [www.kpmg.com.au/mobileinternet/page2.html](http://www.kpmg.com.au/mobileinternet/page2.html).

74 KPMG, *Market Segmentation for Mobile Internet*, [www.kpmg.com.au/mobileinternet/page4.html](http://www.kpmg.com.au/mobileinternet/page4.html).

Mobile data services are expected to have very wide business application once the technology is mature.

#### FINDING

**Mobile phones are important for most businesses and are critical to some owner-operated and high client-contact businesses.**

## INTERNET FOR BUSINESS

Almost all large and medium businesses were connected to the Internet at June 1999 and around 60 per cent of Australia's approximately one million small businesses were online at February 2000.<sup>75</sup>

Many big businesses that have been using e-commerce for years on closed networks are now shifting their operations to the open Internet structure where small and medium size companies focus their electronic business.

The efficiencies and savings of e-commerce increase proportionally with the size of the business. Regardless of size, however, the cost of re-engineering business is substantial and makes the telecommunications services to support such applications a commercial necessity. Networked businesses, especially the large volume, high bandwidth users, require the full raft of available telecommunications services for the effective functioning of the business.

Computer services, legal and accounting services, marketing, and business management services are the leading online industrial users with 63 per cent connected to the Internet. By contrast, the accommodation, cafes and restaurants, transport, storage and construction industry sectors have only 20 per cent online.<sup>76</sup>

While some primary producers have enthusiastically embraced the information economy to access the latest industry and weather information, others prefer traditional sources of information and types of business practice. Barriers to farmers' adoption of computer-based technologies include conservative attitudes, lack of knowledge of computer use, and not being 'of the computer generation.'<sup>77</sup>

The proportion of farms using the Internet increased from 11 per cent to 20 per cent between March 1998 and March 1999, with connections predicted to plateau at around 50 per cent in 'a few years time.'<sup>78</sup> Internet use is varied; broadacre producers (grain, cattle and sheep) are more interested in market reports and pricing information, while other producers are more interested in technical production information.<sup>79</sup>

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75 Yellow Pages, Small Business Index: *Survey of Computer Technology and E-Commerce in Australian Small and Medium Business*, June 2000, p. 1, [www.noie.gov.au/publications/NOIE/SME/yellowpages\\_index.htm](http://www.noie.gov.au/publications/NOIE/SME/yellowpages_index.htm).

76 NOIE, *Current State of Play*, p. 20.

77 Rural Industries Research and Development Corporation (RIRDC), *Personal Computers for Farmers: Current and Future Use*, 98/33, 1998, [www.rirdc.gov.au/reports/HCC/ptp-4a.doc](http://www.rirdc.gov.au/reports/HCC/ptp-4a.doc).

78 ABA, *Science and Technology Statistical Newsletter*, p. 3; Da Rin and Groves, *Demand and Supply of Internet Content*, p. 6.

79 Da Rin and Groves, *Demand and Supply of Internet Content*, p. 5.

## EMAIL

Electronic mail is the most widely used Internet application. At June 1999 over a third of all businesses used electronic mail—with well over 90 per cent of large businesses, two-thirds of medium businesses, and around one third of small and micro businesses using email.<sup>80</sup>

The highest level of email use occurred in the electricity, gas and water supply sector (72 per cent) followed by the business services sector (63 per cent). This compared to 17–19 per cent in the accommodation, cafes and restaurants, construction and transport and storage sectors.<sup>81</sup>

Access to email has become an important part of everyday communication with customers and suppliers and for internal communications. In many businesses it is replacing the fax machine, or at least becoming a significant adjunct to it.

## WORLD WIDE WEB

Connection to the Internet opens up new avenues for performing business functions.

Procurement is one of the key business-to-business transactions widely adopted, reducing companies' expenses, facilitating better supply-chain management and allowing firms to control their inventory in a more efficient manner.<sup>82</sup> Business-to-business transactions are expected to grow exponentially over the next few years.<sup>83</sup>

Business-to-customer transactions focus on sales and promotion, with the use of the Internet to post home pages becoming increasingly common. Most big businesses, and around half of medium and a quarter of small businesses have a home page.<sup>84</sup> However, despite the significant Internet presence of businesses, only 0.4 per cent of total Australian retail sales are transacted through the Internet.<sup>85</sup>

Businesses which have access to the Internet use it to monitor industry developments, keep up to date with legal issues (product liability, intellectual property, safety), Government regulations, standards (including Occupational Health and Safety and tax issues) and, in particular, information about superannuation and wages.<sup>86</sup>

Many businesses also use their Internet connection to pay salaries, transfer funds, check statements and distribute rents through web-enabled banking services.<sup>87</sup> Where transaction services are also provided to clients, high volume capacity is required for the business.

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80 ABS, *Science and Technology Statistical Newsletter*, p. 9.

81 ABS, *Science and Technology Statistical Newsletter*, p. 9

82 NOIE, *Current State of Play*, p. 46.

83 NOIE reports that 'B2B growth seems assured given that in the past few months some 60 global coalitions, representing 278 companies which control US\$3 trillion in annual procurement, have announced plans to build electronic marketplaces.' NOIE, *Current State of Play*, p. 42.

84 Yellow Pages, *Survey of Computer Technology*, p. 2.

85 NOIE, *Current State of Play*, p. 30.

86 Yellow Pages, *Survey of Computer Technology*, p. 9

87 Yellow Pages, *Survey of Computer Technology*, p. 9.

Farming businesses use the Internet to access commodity market reports, information on pricing, technical production, the weather, supplies and financial information.<sup>88</sup>

#### FINDING

**Internet connection at speeds enabling web-browsing is a vital component of the operations of many small, most medium and all big businesses, with variation among different business sectors.**

## HIGH BANDWIDTH DATA SERVICES FOR BUSINESS

Big business is a major consumer of all telecommunications services, from basic applications to high bandwidth solutions. Corporations frequently require dedicated leased lines and high speed, cost-effective data transmission—using asynchronous transfer mode or frame relay—to support local and wide area networks with data, voice and video all run on the network.

Networking a business enables the dissemination of a range of corporate information and training programs, control of inventory and business-to-business transactions. Banks and other major service deliverers also make millions of secure transactions over a broad geographical spread. Bandwidth requirements will continue to grow in order to process the escalating number of business transactions with customers and the expected explosion in business-to-business transactions.<sup>89</sup>

Generally only high data-volume or data-intensive businesses require high data speeds for both upstream (sending information requests) and downstream (downloading data) communications. Small and medium-sized businesses conducting e-commerce activities need to have their websites hosted by a professional, centrally located web host for reasons of security and assurance and therefore do not generally need symmetrical high speed data services.

The National Bandwidth Inquiry indicated that demand for video services such as video telephony and video conferencing is currently limited mainly to large corporate organisations, government and some small specialist businesses. That Inquiry expected that the take-up of video services would ‘continue to grow as the costs of terminal equipment and bandwidth decline and processing power continues to increase.’<sup>90</sup>

Specialty multimedia businesses have a high demand for video services. Digital production, post-production and, to a limited degree at present, distribution and exhibition of film and video sequences is very bandwidth intensive. The ability to transfer multimedia data between post-production businesses would enable Australia to compete for major national and international business.

#### FINDING

**High speed data services, including dedicated lines, are needed by almost all big businesses and corporations and by some specialist smaller businesses.**

88 Da Rin and Groves, *Demand for and Supply of Internet Content*, p. viii.

89 Australian Information Economy Advisory Council (AIEAC), *National Bandwidth Inquiry: Report of the Australian Information Economy Advisory Council*, Canberra, 1999, p. 80.

90 AIEAC, *National Bandwidth Inquiry*, p. 81.

# GOVERNMENT AND SERVICES TELECOMMUNICATIONS NEEDS

Government departments have major telecommunications needs and bandwidth requirements in order to manage very large and frequently geographically dispersed organisations.

In Australia, governments have been proactive in adopting the new technologies to deliver their own services and in encouraging the broader social and business communities to do likewise. The Commonwealth aims to be ‘a leading edge online user’ and to demonstrate the benefits of widespread take-up of the information economy.<sup>91</sup> The Commonwealth’s *Government Online* strategy, aims to have virtually all government services available electronically around the clock to anyone. Business-to-government online activity will accelerate with services such as electronic lodgment of business activity statements with the Australian Tax Office.

Telephone and fax are ubiquitous needs among government organisations. At June 1999 around 88 per cent of government organisations were online, including 100 per cent of Federal departments and agencies.<sup>92</sup> Use of dedicated data lines is equally as important for the functioning of large government departments as it is for corporations and big business.

## DELIVERING GOVERNMENT SERVICES

Two government sectors have particularly prominent telecommunications needs. The health and education sectors are very large in terms of numbers and diversity of delivery centres, ranging from individual country schools to large universities and from remote community health centres to major city hospitals and laboratories. Their total budgets, number of employees and geographical reach are on a similarly large scale. The value of these sectors to Australians is very high due to their critical social role.

Telecommunications services play an increasingly important role in these sectors’ capacity to administer and deliver services to millions of clients over an extensive geographic area.

### HEALTH SECTOR

The health sector comprises health consumers and health providers—including public and private hospitals, general practitioners, specialists, health insurers, aged care, community health centres and welfare organisations.

The health sector is a major user of telecommunications services and currently accounts for 15 per cent of the market share for bandwidth. Telecommunications services are crucial for this sector:

*In recent years, the improvements in medical technology to provide fast and accurate diagnosis together with the drive for efficient spending of the health funding, have increased the demands placed on telecommunications services...<sup>93</sup>*

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91 Office of Government Online, *Government Online: The Commonwealth Government’s Strategy*, April 2000, [www.ogo.gov.au/projects/strategy/GovOnlineStrategy.htm](http://www.ogo.gov.au/projects/strategy/GovOnlineStrategy.htm).

92 ABS, *Science and Technology Statistical Newsletter*, p. 4.

93 Northern Rivers Health Service, submission, p. 1.

Current demand is expected to increase substantially, with the National Bandwidth Inquiry forecasting that health sector bandwidth usage would grow to 21 per cent of market share by 2004. Such growth is being managed at a national level to coordinate delivery of health services online and develop health networks by June 2001.<sup>94</sup>

State governments throughout Australia are also deploying telecommunications services to connect the health sector at regional and state levels. For example, some regional medical practices are connected to a wide area network involving hospitals, aged care and community health care centres, with radiology and pathology services also linked to the network.<sup>95</sup>

Aside from networking the sector, the other main driver of increasing demand for high bandwidth telecommunications services will come from the adoption of new communications-based management and delivery tools such as:

- telehealth (including tele-radiology and tele-psychiatry);
- storage, retrieval and communication of health-related data; and
- electronic business transactions and management of e-business.<sup>96</sup>

These fields are collectively known as e-health—the use of digital data transmitted electronically for clinical, educational and administrative applications.<sup>97</sup> However, it may be more than five years until the potential of bandwidth-intensive digital imaging technologies is fully realised and the dominant applications and technologies are determined.<sup>98</sup>

## EDUCATION SECTOR

The education sector—comprising schools, universities, technical and vocational training, distance education, adult and community education and public and private educational bodies—currently consumes 12 per cent of the total bandwidth market.

Ninety-six per cent of educational institutions have access to online services.<sup>99</sup> The higher education sector is serviced by the Australian Academic Research Network. Traffic growth has slowed to around 50 per cent a year (from 50 per cent each nine months) as universities have explicitly sought to limit the cost of Internet traffic.<sup>100</sup>

Universities were early adopters, and remain high volume users, of the Internet and other telecommunications services. Australian universities are using the Internet to deliver distance education to students within Australia and overseas, for tutorials, lodgment of assignments, delivery of course material and communication between students and their lecturers. High bandwidth networks support universities' complex administrative systems, covering academic, financial and legal functions.<sup>101</sup>

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94 National Health Information Management Advisory Council, *Health Online*, November 1999, p. 39.

95 Mark Pilbeam, 'Medical Informatics in a Regional Setting,' *Community Networking*, [www.communityconference.vicnet.net.au/pilbeam.htm](http://www.communityconference.vicnet.net.au/pilbeam.htm).

96 AIEAC, *National Bandwidth Inquiry*, p. 84.

97 [www.noie.gov.au/projects/ecommerce/ehealth/index.htm](http://www.noie.gov.au/projects/ecommerce/ehealth/index.htm).

98 AIEAC, *National Bandwidth Inquiry*, p. 84.

99 White, *Online Education Report*, [www.edna.edu.au/EdNA](http://www.edna.edu.au/EdNA).

100 AIEAC, *National Bandwidth Inquiry*, pp. 82, 83.

101 Education Network Australia (EdNA) Reference Committee, *The Way Forward: Higher Education Action Plan for the Information Economy*, 1999, [www.edna.edu.au/EdNA](http://www.edna.edu.au/EdNA).



Aside from using telephones and facsimiles, schools are rapidly adopting online technologies. Certainly, school work involving Internet research and information technology skills is now strongly embedded in school curricula. Increasingly, schools are moving computer-based learning and Internet research into classrooms—from separate resource centres and libraries—to enable students to fully utilise technology-based education resources and to acquire IT skills.

Delivery of, and access to, online resources and educational programs through the Internet is particularly important for schools and students in rural and remote Australia:

*All State and Territory education authorities are implementing Internet access programs, but are finding that there are particular difficulties in supporting adequate provision for rural schools and for students involved in distance learning...*<sup>102</sup>

Cost of access is still seen as the main barrier to more extensive and higher bandwidth Internet connectivity within schools. This is particularly the case for schools in non-metropolitan areas. Education Network Australia claims that the price of a 64 kbps connection can be twice as much for a non-metropolitan school as for a metropolitan school.<sup>103</sup>

As with the health sector, continued growth in demand for bandwidth is likely in the education sector, up from 12 per cent of total usage in 2000 to an expected 15 per cent in 2004.

*We expect our data, video and audio traffic over our network to significantly grow over the next four year period...*<sup>104</sup>

Drivers of increased demand are likely to include the further development of virtual campuses, online programs and learning materials and government support for the adoption of online technologies. The availability of tools that digitise visual and audio material is increasing the expectation that such material be made available for teaching.

#### **FINDING**

**The full raft of telecommunications services—fixed phones, mobiles, Internet connections and dedicated high speed data lines—are required by large government departments and are particularly important to the service delivery sectors, such as health and education.**

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102 Education Network Australia (EdNA) School Advisory Group, submission, p. 2.

103 Education Network Australia – Inquiry communication.

104 NSW Department of Education and Training, submission, p. 2. This Department's current data network comprises approximately 2400 wide area networks, most with 64kbps links which it wants upgraded to 8 to 10 Mbps, and links of up to 100 Mbps to their points of presence. (John Banham, NSW Department of Education and Training, Sydney roundtable meeting, 9 June 2000).

## CHAPTER 5

# FIXED TELEPHONY, PAYPHONES AND SPECIAL SERVICES



### SUMMARY

Industry performance against the Customer Service Guarantee (CSG) has generally improved since its introduction in 1998. However, there are some aspects concerning CSG performance that are not meeting reasonable public expectations. A number of concerns also exist in the management of customer-provider interactions.

Telstra's future performance in these areas will be influenced by initiatives such as Country Wide and its Access Renewal project.

Evidence to the Inquiry suggests a need for greater focus by the regulator on collecting performance data on service reliability at a highly disaggregated level in order to identify recurrent problems.

Regulatory tools used to address service levels can have unintended outcomes which affect consumer welfare and limit competition.

An examination of the current Universal Service Obligation (USO) operations, as they relate to the provision of payphones, found that they are not meeting the needs of remote Indigenous communities.

Limited resources and inadequate training arrangements have prevented people with disabilities from taking advantage of services and equipment to meet their needs. There are also low levels of awareness about services available to people with special requirements, such as those with medical priorities or those on low incomes.

The Inquiry has been asked to assess the performance of the telecommunications industry against key regulatory obligations—the Customer Service Guarantee (CSG) and Universal Service Obligation (USO)—as well as the extent to which the industry is meeting the needs of those with special requirements.

CSG and USO regulations offer telecommunications consumers minimum standards for fixed telephone services, payphones and digital data services. A new CSG came into effect in July 2000.

Telstra is the major provider within the market, particularly in rural and remote areas, and is the current universal service provider for voice and digital data services, as well as payphones.

## FIXED TELEPHONE SERVICES

The USO ensures that all Australians have reasonable access to a standard telephone service, digital data services and payphones, wherever they live or carry on business. Some 96.8 per cent of all households have a standard telephone service. Penetration rates vary across Australia, from 98.3 per cent in the Australian Capital Territory to 91.4 per cent in urban areas of the Northern Territory.<sup>1</sup> The 3.2 per cent of households across Australia without a standard telephone service, either have mobile phone access, are awaiting the connection of the service or they do not want a service. These penetration rates compare favourably with most developed nations and suggest that universal access to fixed telephony has been effectively achieved.

The CSG sets timeframes for a provider to make new service connections, either with or without available infrastructure. Timeframes are also set for reconnections to a previously working standard telephone service, known as ‘in-place’ connections. The ease of connecting new services depends on the availability of infrastructure to the site. Available infrastructure implies that there are existing facilities such as cables and sufficient capacity for connecting a customer’s site to a standard telephone service. The service personnel need only connect the telephone to that infrastructure. If the site does not have readily accessible infrastructure then the service personnel must provide the new facilities and then connect the telephone to the site. In-place connections are essentially administrative matters at the local exchange.

The CSG also sets timeframes for repairing faults affecting the standard telephone service.

In 1998–99 Telstra accounted for approximately 94 per cent of connections and faults restored under the CSG, while Cable and Wireless Optus (CWO)—the next largest provider—accounted for approximately 5 per cent. CWO connected approximately 20 per cent of all new services in 1998–99 to its hybrid fibre coaxial cable (HFC) network.<sup>2</sup> As at 30 June 2000, the major providers of local access services to consumers were Telstra with 10.24 million access lines<sup>3</sup> and CWO with 400 000 access lines.<sup>4</sup>

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1 Australian Communications Authority, *Telecommunications Performance Report 1998–99*, Canberra, 1999, p. 71.

2 ACA, *Telecommunications Performance Report*, pp. 17, 19 and 26.

3 Telstra – Inquiry communication.

4 CWO – Inquiry communication.

## THE PUBLIC SWITCHED TELEPHONE NETWORK

Much of the discussion on telecommunications relates to the public network of telephone cables and exchanges that constitute the overwhelming bulk of the fixed telecommunications network. There are two primary components to the network. First, there is the extensive *customer access network* (CAN), comprising the cables (usually copper wire pairs) that connect customer premises to their local exchange. Some of the network—mainly in parts of rural and remote Australia—uses technologies such as radio or satellite, which are described in chapter 6. This network, also known as the ‘local loop’ or ‘the last mile’, is predominantly owned by Telstra with other carriers connecting to it.

Second, there is the *backbone, or trunk, network*, predominantly composed of optical fibre cables, which connects exchanges to each other.

The whole network is known as the public switched telephone network (PSTN), since it operates through dial-up connections which are circuit *switched* through the network of exchanges to the called number. Once the call is terminated, the switched circuits become available for other telephone calls.

There are also *private networks* which may also interconnect with the public network. These are usually dedicated (unswitched) connections over private lines used by the corporate and government sectors using cable technologies that allow higher bandwidth than conventional copper wire. While most of the issues addressed by the Inquiry focus on the PSTN, others relate to high bandwidth users, such as dedicated communications networks.

The residential and small business network uses copper pair cabling for the traditional voice telephone service. Much of this legacy network is decades old and under strain from the surging demand for data services—as are some regional and rural exchanges that rely on older technologies. This is compounded by demand for more lines per premises, as the network was originally designed on the basis of five lines per four households.

# SATISFACTION WITH THE TELECOMMUNICATIONS INDUSTRY

Through its consultations the Inquiry received valuable information on key community concerns with the industry and the quality of telecommunications services. To obtain a broader picture of community views, the Inquiry commissioned market research into residential and small business demand for, and views regarding, telecommunications services.

Respondents indicated generally high levels of satisfaction and perceived only marginal differences between the performance of the telecommunications industry and other key utility services. The majority indicated that telecommunications providers mostly meet their expectations across a range of service aspects.

Eighty three per cent of households and small businesses perceive either an improvement or no change in service delivery since 1998.<sup>5</sup>

While small businesses from capital cities were more likely to say that delivery of service had improved compared with those in other regions, overall most believed that services had improved or remained the same.

**TABLE 5.1: PERCEPTIONS ABOUT THE OVERALL DELIVERY OF TELECOMMUNICATION SERVICES SINCE 1998**

Base: All	HOUSEHOLD					SMALL BUSINESS				
	Total	Met	Reg	Rur	Rem	Total	Met	Reg	Rur	Rem
n =	984	253	250	250	229	1024	251	251	250	272
	%	%	%	%	%	%	%	%	%	%
Improved delivery	42	44	43	37	41	41	45	39	34	32
Delivery has remained the same	41	38	41	44	43	42	41	39	50	45
Decline in delivery	14	14	14	15	13	15	12	19	14	19
Don't know	3	4	3	3	3	2	2	2	2	4

Source: Research International, *Australian Telecommunications Needs and Expectations*, p. 19.

The most common reasons for a belief that services had improved were the availability of new products and services, competition, price and service levels.

Generally, household respondents from more highly populated areas cited competition as a reason for improved delivery. Consumers from metropolitan areas appeared to attribute improvements in the delivery of telecommunications services to competition and its associated impact on service levels and prices. This is probably to be expected given that competition is strongest in these areas of Australia.

<sup>5</sup> Research International, *Australian Telecommunications Needs and Expectations*, p. 18. Available at [www.telinquiry.gov.au](http://www.telinquiry.gov.au).

Conversely, consumers from remote regions were more likely to perceive the availability and quality of products and services—rather than price and competition—as reasons for improvement in service quality.

**TABLE 5.2: REASONS FOR IMPROVED OVERALL DELIVERY OF TELECOMMUNICATION SERVICES**

Base: All who said delivery had improved	HOUSEHOLD					SMALL BUSINESS				
	Total	Met	Reg	Rur	Rem	Total	Met	Reg	Rur	Rem
n =	406	115	104	94	93	387	113	99	89	86
	%	%	%	%	%	%	%	%	%	%
Availability of new products and services	33	43	28	36	35	41	38	37	57	45
Competition	30	50	27	11	5	24	25	26	18	5
Price	26	31	25	24	10	14	15	11	12	6
Service levels	22	23	21	29	30	28	28	28	26	25
Quality of products and services	15	18	12	21	28	21	22	11	25	33

Source: Research International, *Australian Telecommunications Needs and Expectations*, p. 20.

Note: Multiple responses allowed.

Service levels were the most common reason cited by the 14 per cent who perceived a decline in the delivery of telecommunications service since 1998.

Research also indicated concerns of a small proportion of customers, particularly those in rural and remote areas of Australia, about a number of service aspects. For example, ten per cent of all households expressed frustration over attempts to contact relevant people within their telephone company. Sixteen per cent of households considered that their expectations concerning the time taken to repair a fault were only being ‘occasionally met’ or ‘not met’. Thirteen per cent of households also felt that the speed of getting a new service connected was only being ‘occasionally met’ or ‘not met’.<sup>6</sup> These concerns are consistent with views expressed during the Inquiry’s consultations.

#### FINDING

Market research conducted for the Inquiry found that Australians are generally satisfied with the service delivered by their telecommunications provider but also identified areas of dissatisfaction among some people with aspects of service performance.

<sup>6</sup> Research International, *Australian Telecommunications Needs and Expectations*, p. 28.

## CUSTOMER SERVICE GUARANTEE PERFORMANCE

This section analyses the performance of service providers in meeting those minimum timeframes established under the CSG for connecting services and repairing faults.

Details on the specific requirements of the CSG Standard are contained in Appendix C.

### PUBLIC EXPECTATIONS OF COMPLIANCE

The Inquiry has been asked to make an assessment of whether Telstra and other carriers and service providers are meeting their statutory requirements under the CSG in metropolitan, regional, rural and remote areas in accordance with reasonable public expectations of service levels. While Telstra and other carriers are able to provide data concerning their performance to varying degrees, assessing that performance against a subjective test of reasonable public expectations is more difficult.

The Inquiry found a low public awareness of the regulatory standards and little knowledge of the costs to providers of improving performance against the CSG or USO. However, there was a clear message that consumers are more interested in having the service than receiving compensation for poor performance.

*We [the Telecommunications Industry Ombudsman] will deal with complaints about claims for compensation for business loss over and above the CSG, but the small businesses simply say, "We don't want to have make those claims. We want, when a fault is detected, for it to be rectified quickly. When we need additional lines to service our businesses, particularly in growth phases, we need them to be provided within the time frames of the guarantee."<sup>7</sup>*

The Inquiry's market research included questions to assist in establishing the community's expectations of CSG performance.

All respondents were given a description of the CSG and asked how often they would expect a provider to meet this standard in percentage terms.

Most consumers—61 per cent of households and 71 per cent of businesses—expected a performance level of 91 to 100 per cent (refer to Table 5.3).<sup>8</sup> Those respondents from non-remote areas, especially small businesses, were more likely to expect higher performance levels than those from remote areas. This may reflect an acceptance of the difficulties of providing services in remote areas. However, given the CSG timeframes include differing service levels for rural and remote areas, there would appear to be no reason to accept a lower level of performance.

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7 John Pinnock, Telecommunications Industry Ombudsman, Sydney roundtable meeting, 9 June 2000.

8 Research International, *Australian Telecommunications Needs and Expectations*, p. 11.

**TABLE 5.3: CONSUMER EXPECTATION OF SERVICE PROVIDER CSG PERFORMANCE**

Base: All	HOUSEHOLD					SMALL BUSINESS				
	Total	Met	Reg	Rur	Rem	Total	Met	Reg	Rur	Rem
n =	984	253	250	252	229	1024	251	251	250	272
	%	%	%	%	%	%	%	%	%	%
0% – 30%	2	2	2	3	2	1	1	2	2	5
31% – 70%	8	7	7	12	19	7	6	8	7	16
71% – 80%	10	11	10	9	9	7	6	7	7	10
81% – 90%	14	13	15	10	7	10	11	9	8	10
91% – 100%	61	62	61	59	58	71	71	70	73	57
Don't know	6	5	6	8	5	4	4	5	4	2

Source: Research International, *Australian Telecommunications Needs and Expectations*, p. 11.

While generally expecting a high level of performance, two-thirds of all consumers surveyed were not prepared to pay more—or forego future price cuts—in order for service providers to meet their nominated performance levels.<sup>9</sup>

For the purposes of analysis, the Inquiry considers compliance with the CSG in the range above 90 per cent to meet reasonable public expectations.

<sup>9</sup> Research International, *Australian Telecommunications Needs and Expectations*, p. 11.



## NEW CSG STANDARD

The *Telecommunications (Customer Service Guarantee) Standard 2000* came into force on 7 July 2000. The major changes under the new Standard are that the timeframe for connecting customers in minor rural and remote areas with available infrastructure has been initially reduced from 40 to 30 working days. Customers requesting in-place connections can expect the request to be completed within two working days where it was previously three. The Inquiry's analysis found that Telstra has generally met the respective timeframes of the old CSG Standard, with its CSG compliance being in excess of 95 per cent. Information provided by Telstra suggests that it will be able to achieve similar performance levels under the new Standard's tighter timeframes.

Telstra provided the Inquiry with its March 2000 quarter results adjusted to reflect what its performance would have been using the new Standard and its actual July and August 2000 performance figures. Telstra re-cast its monthly data for the March 2000 quarter in those areas of the CSG that were subject to major change under the new Standard. The adjustment involved a number of assumptions and allowances to reflect the differences between the two Standards, including:

- the effects of excluding customers who have five or more eligible services; and
- the changes to the CSG timeframes.

The adjusted results for re-connections and new connections in remote and minor rural areas with infrastructure indicate only minor decreases in performance of less than one per cent nationally for any given month—refer to Table 5.4. At the state or territory level, the monthly variations were slightly larger but included both increases and decreases in performance. Further detail of State and Territory results can be found at Appendix D.

Given the minor effects caused by the changes to timeframes between the 1997 and 2000 Standards, the Inquiry anticipates little variation in the trends reflected in service providers' performance against the 1997 Standard produced in this Report and the new Standard.

Telstra's performance for July and August 2000, the first two months after the introduction of the new Standard, was generally consistent with its more recent performance under the 1997 Standard.

**TABLE 5.4: ESTIMATED IMPACT ON TELSTRA'S NATIONAL PERFORMANCE OF CHANGES TO THE CSG STANDARD**

	Month	Performance against the CSG Standard 1997	Estimated performance against the CSG Standard 2000	Difference
In-place connections all geographic areas	Jan-00	97.5%	97.0%	-0.5%
	Feb-00	96.9%	96.3%	-0.6%
	Mar-00	96.4%	95.9%	-0.6%
Connections in minor rural areas with infrastructure	Jan-00	98.9%	98.1%	-0.8%
	Feb-00	98.9%	98.1%	-0.8%
	Mar-00	98.9%	98.3%	-0.6%
Connections in remote areas with infrastructure	Jan-00	96.4%	95.7%	-0.7%
	Feb-00	97.3%	97.9%	0.6%
	Mar-00	99.0%	98.3%	-0.7%

Source: Telstra (adjusted data).<sup>10</sup>

**TABLE 5.5: TELSTRA'S ACTUAL PERFORMANCE UNDER THE NEW CSG STANDARD**

Type of service	July 2000	August 2000
In-place connections all geographic areas	95.2%	94.1%
Connections in minor rural areas with infrastructure	97.9%	98.5%
Connections in remote areas with infrastructure	96.1%	98.8%

Source: Telstra (adjusted data).

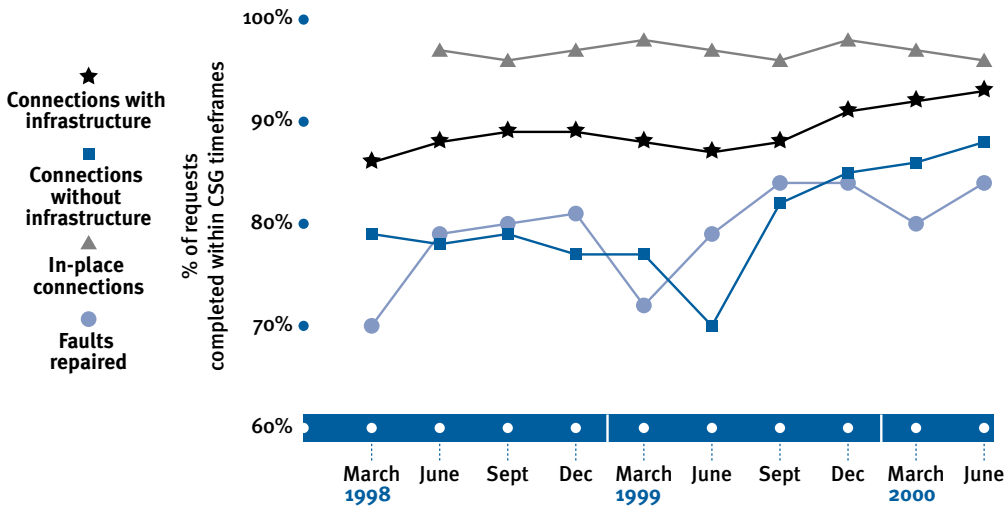
## TELSTRA'S PERFORMANCE AGAINST THE CSG STANDARD 1997

In addition to information available from the Australian Communications Authority (ACA), Telstra provided the Inquiry with the following data:

- the percentage and volume of all connections and fault repairs completed within the CSG timeframes; and
- data for the September 1999, December 1999 and March 2000 quarters to indicate the time taken to complete requests not initially met within the CSG timeframes ('tail data').

<sup>10</sup> Data available from the ACA and Telstra both included performance with and without the application of exemptions from the CSG Standard (known as unadjusted and adjusted data respectively). The analysis of performance conducted in this chapter uses both adjusted and unadjusted figures depending on the analysis required and the available data.

**FIGURE 5.1: TELSTRA'S NATIONAL PERFORMANCE AGAINST THE CSG TIMEFRAMES FOR CONNECTING SERVICES WITH AND WITHOUT INFRASTRUCTURE, RECONNECTING SERVICES AND FAULT REPAIRS, MARCH QUARTER 1998 TO JUNE QUARTER 2000**



Source: ACA, Telstra's Customer Service Guarantee Compliance Report, (unadjusted data).<sup>11</sup>  
 Note: Results for in-place connections are not available for January 1998 to March 1998 inclusive.

An analysis of ACA and Telstra data in Figure 5.1 shows that since the CSG was introduced Telstra has improved its performance against all minimum timeframes, with the exception of a minor variation in connecting in-place services. By the June quarter 2000, its performance had increased, such that on a national basis it was meeting the public's expectations for all types of connections except for those new service connections where there was no available infrastructure. New connections to sites with available infrastructure and in-place connections represent approximately 75 per cent of all requests for connections and repairs subject to the CSG. Connections without available infrastructure represent two per cent of all requests subject to the CSG.<sup>12</sup>

In the year since the June quarter 1999, Telstra has substantially improved its performance for connections where there was no available infrastructure. By June 2000 it was connecting 88 per cent of these new services in the CSG timeframe. This is only marginally below the performance which appears to be expected by the public.

Despite considerable improvements since 1998 in meeting the CSG timeframes for repairing faults, by the June quarter 2000, Telstra had achieved an 84 per cent compliance. This level of performance is below public expectations.

11 Telstra and the ACA provided the Inquiry with access to Telstra's quarterly quality of service reports used by the ACA to compile the Telecommunications Performance Monitoring Bulletins.

12 Telstra – Inquiry correspondence. These figures represent the requests for the June 2000 quarter.

Telstra claims that its improving capacity to connect both in-place and new services within the CSG timeframe coincides with increased demand for connections—a 4.5 per cent increase in requests since 1998–1999.<sup>13</sup> Conversely, over the same time, reports of faults that are subject to the CSG have fallen by 14 per cent. In part, this decrease in the number of faults reported is an indication that Telstra’s initiatives to lessen the incidence of faults in its network are having a positive effect. These initiatives are discussed later in this chapter.

Telstra also provided the Inquiry with data concerning its performance for the months of July and August 2000—the first two months of the new Standard. While not directly comparable, the results are generally consistent with its performance under the old Standard. There was a minor decrease in the percentage of in-place connections compared with performance over the preceding three months. Telstra’s performance in fault repairs, at 88 per cent in July and 92 per cent in August, represents a significant improvement and, if sustained, would mean its performance is meeting reasonable public expectations.

**TABLE 5.6: TELSTRA’S NATIONAL PERFORMANCE AGAINST THE CSG STANDARD 2000**

Type of service	July 2000	August 2000
In-place connections	95%	94%
New connections with infrastructure	93%	94%
New connections without infrastructure	89%	88%
Fault repair	88%	92%

Source: Telstra (adjusted data).

These national results are generally consistent with those for the different geographic regions that apply to each service with some notable exceptions.

#### TELSTRA’S PERFORMANCE FOR CONNECTING NEW SERVICES WITHOUT AVAILABLE INFRASTRUCTURE IN URBAN AND MAJOR RURAL AREAS

Telstra’s ability to connect new services to sites without infrastructure in urban and major rural areas within CSG timeframes has at times been substantially below its performance on a national basis. In the June quarter 1999, Telstra was only achieving compliance levels of 63 and 56 per cent of services in urban and major rural areas respectively—however, by the June quarter 2000 it had improved its performance to 85 and 83 per cent respectively.<sup>14</sup>

Telstra’s relatively poor performance for the June 1999 quarter was investigated by the ACA.<sup>15</sup> The ACA report found a number of systemic factors contributed to poor performance, such as inadequate infrastructure, deficient records of cable distribution pairs, and poor work practices and procedures.

<sup>13</sup> Telstra – Inquiry correspondence.

<sup>14</sup> ACA, *Telstra Customer Service Guarantee Compliance Report—June Quarter 2000*.

<sup>15</sup> ACA, *Investigation of Telstra’s Performance Under the Customer Service Guarantee Standard and the Universal Service Obligation*, Melbourne, 1999.

Telstra's performance in this area is a source of significant consumer frustration.

*When they [Telstra] give a specific date for the connection of a service, why is it necessary the day before the intended connection to come out looking for the location of the connection, and then admit that they are unaware as to the availability of cable and tell me that it now has to go to planning?<sup>16</sup>*

*I can understand there may be a delay; but then two days before the next date they gave me for reconnection of our services, they rang again and said, "Well, we can't connect you. There is insufficient cabling in that area," we're talking about a major regional centre here, and, "It could be maybe we will connect you in a week's time and it could be up to three months before you get Internet." I mean, I don't find that acceptable under any terms and conditions.<sup>17</sup>*

In its review of the CSG in 1998, the ACA recommended the abolition of an extended timeframe where no infrastructure was available.<sup>18</sup> The Minister for Communications, Information Technology and the Arts chose not to accept this recommendation, citing the cost burden on carriers which would be passed on to retail customers.<sup>19</sup> The Minister indicated, however, that the issue would be revisited following further analysis.

The Inquiry acknowledges the difficulties that might be caused to telephony providers by abolition of an extended timeframe. However, the Inquiry considers that alternative approaches should be contemplated to encourage providers to more effectively plan for new services and avoid misinforming customers about expected connection timeframes.

## TELSTRA'S PERFORMANCE IN REPAIRING FAULTS

The failure to repair faults within CSG timeframes is also a source of considerable frustration in the community.

*[T]here has to be a minimum time our phones can be out. You simply cannot have phones out for eight weeks at a time, particularly if that's your only access to the outside world.<sup>20</sup>*

Telstra's performance until June 2000 in remote areas has been significantly below that in urban and rural areas. By the June quarter 2000, only 75 per cent of faults were being repaired within CSG timeframes in remote areas, compared with 84 and 86 per cent in urban and rural areas, respectively. Although covering a limited timeframe, Telstra's performance in remote areas for July and August 2000 suggest substantial improvements are being made.

The results presented in this chapter focus on national figures. These figures generally differ little from those at a state and territory level (presented in Appendix D).

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16 Mal Pitman, submission, p. 1.

17 Vivienne Dwyer, Mackay Children's Support programs, Mackay roundtable meeting, 21 June 2000.

18 ACA, *Review of the Telecommunications Customer Service Guarantee*, Melbourne, 1998, p. 5

19 Minister for Communications, Information Technology and the Arts, media release, *Revision of Customer Service Guarantee Standard*, 7 July 1999.

20 Anne Copin, Isolated Children's Parents' Association, Port Hedland roundtable meeting, 8 June 2000.

## THE PERFORMANCE 'TAIL'

While an analysis of Telstra's performance solely against the CSG timeframes is useful, it does not provide a full picture. Where Telstra completes a service within a short period of the CSG standard, the customer is likely to be less affected than if the delay is significantly longer.

The Inquiry found some cases of extreme delays by Telstra in connecting and repairing services.

*Lead-in times and installation and repairs ... there is an extremely poor service provision in that respect. The length of time required for the transfer and installation of telephones to new housing accommodation and business premises can be and is frequently as much as nine and 10 weeks that I'm aware of.*<sup>21</sup>

Market research undertaken separately by the Inquiry and the ACA also found higher than average levels of frustration regarding fault repairs. For example, 16 per cent of household respondents and 22 per cent of small business respondents said that service expectations regarding fault repair times were only being 'occasionally met' or 'not met'.<sup>22</sup> Of those who had reported a fault in 1999–2000, 38 per cent of household respondents and 46 per cent of small business respondents were dissatisfied with the time taken to repair it.<sup>23</sup>

The Inquiry's research also found that households and small businesses considered the speed of getting new services to be important. Sixty five per cent of respondents considered service providers 'always met' or 'moderately met' their expectations, but 13 and 20 per cent of households and small businesses respectively believed their expectations were being only 'occasionally met' or 'not met'.<sup>24</sup>

Data provided by Telstra to the Inquiry suggests that 98 per cent or more of all connection requests subject to the CSG are met within the initial CSG timeframe plus an additional ten working days, regardless of the geographic location or type of request. However, Telstra had difficulty connecting services to properties in urban and major rural areas that do not have available infrastructure. By the March 2000 quarter, Telstra was only able to connect approximately 92 and 87 per cent of these requests within an additional ten working days of the CSG timeframe in urban and major rural areas respectively (refer Figure 5.2).

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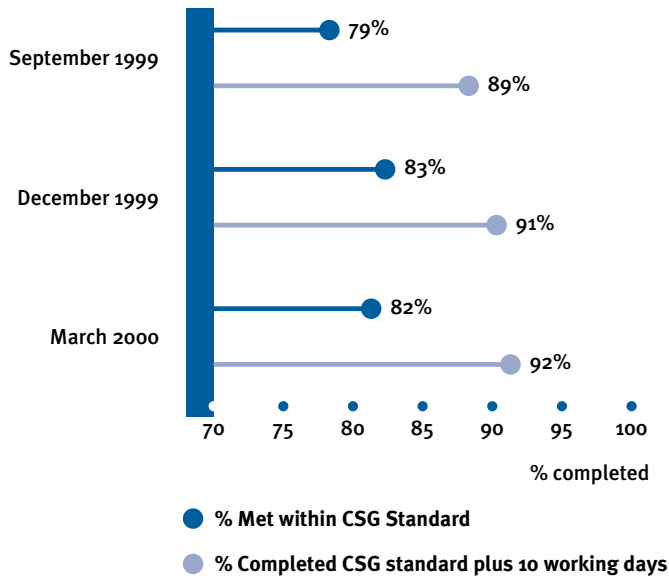
21 Ivan Davie, Northern Regional Police Command, Port Hedland roundtable meeting, 8 June 2000.

22 Research International, *Australian Telecommunications Needs and Expectations*, p. 28.

23 ACA, *Consumer Satisfaction Survey 2000*, [www.aca.gov.au/publications/cons\\_satis\\_report2000.htm](http://www.aca.gov.au/publications/cons_satis_report2000.htm).

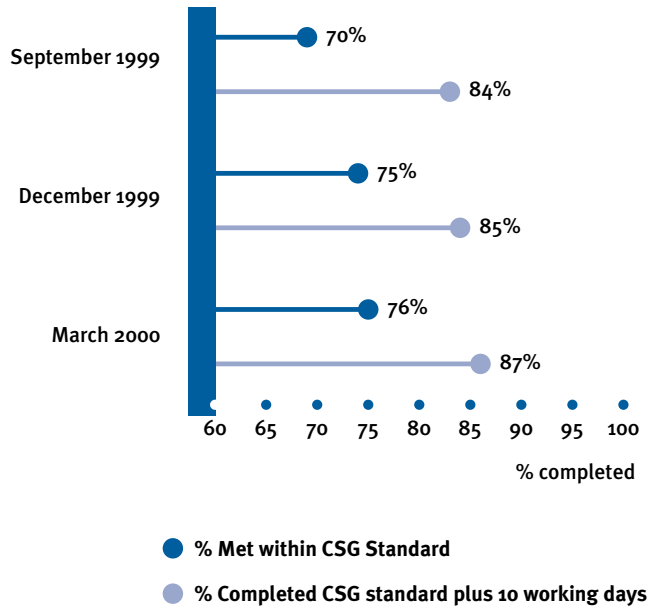
24 Research International, *Australian Telecommunications Needs and Expectations*, p. 20.

**FIGURE 5.2: CONNECTION TIMES FOR URBAN AREAS WITHOUT INFRASTRUCTURE**



Source: Telstra (adjusted data).

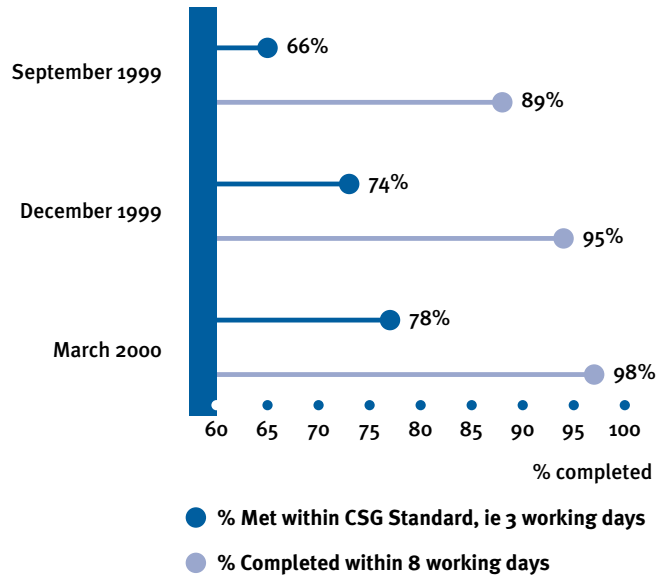
**FIGURE 5.3: CONNECTION TIMES FOR MAJOR RURAL AREAS WITHOUT INFRASTRUCTURE**



Source: Telstra (adjusted data).

Further, Telstra advised the Inquiry that it repaired 99 per cent or more of all faults reported from customers in urban and rural areas within the initial CSG timeframe plus an additional five working days. While Telstra was able to repair only 89 per cent of all faults within that timeframe in remote areas in the September 1999 quarter, its performance improved substantially in the two subsequent quarters. (refer to Figure 5.4)

**FIGURE 5.4: REPAIR TIMES FOR REMOTE AREAS**



Source: Telstra (adjusted data).

Evidence before the Inquiry suggests Telstra has recently made real improvements in reducing the number of connection and fault repair requests which are unmet for significant periods beyond the CSG timeframes. Nevertheless, these instances of failure can cause significant consumer detriment to those affected.

**FINDINGS**

Telstra’s performance against the CSG continues to improve, despite an increasing demand for connections.

Performance in connecting new in-place services, new services with infrastructure and new services without infrastructure in minor rural and remote areas is meeting public expectations. Performance in connecting new services without infrastructure in urban and major rural areas and in repairing faults, while improving, has not yet achieved sustained levels which would meet public expectations.

Evidence exists of isolated circumstances where Telstra’s connection and repair performance is well outside the CSG standards.



## OTHER INDUSTRY PARTICIPANTS' PERFORMANCE

Only Telstra has been able to provide the Inquiry with performance data consistent with minimum service levels of the CSG Standard 1997. The Inquiry is concerned at the lack of available information to adequately measure the performance of other providers against the CSG Standard but has noted the recent initiatives of the ACA to introduce comparative reporting.<sup>25</sup> CWO, AAPT and Primus have all provided alternative data to the ACA that gives some indication of their respective performances against the Standard.

### CABLE AND WIRELESS OPTUS

CWO does not provide direct performance data concerning the provision of new services to consumers. However, CWO provides the number of fault reports at the national level and the percentage of those faults restored over time (refer Table 5.7). As CWO increases the number of services connected, the number of reported faults has also increased. While CWO is clearing a number of these faults, the percentage of faults cleared within 24 hours is decreasing marginally to below 90 per cent.

**TABLE 5.7: CABLE & WIRELESS OPTUS—NUMBER OF FAULT REPORTS AND CLEARANCE TIMES**

Quarter	Percentage of faults cleared by:		Total faults reported
	One day	After three days	
Mar-00	85%	94%	21 747
Dec-99	82%	92%	16 944
Sep-99	91%	94%	15 313
Jun-99	93%	97%	11 407
Mar-99	93%	97%	10 368

Source: ACA, *Telecommunications Performance Monitoring Bulletin Issue 12*, pp. 19–20.

### PRIMUS

Primus provided data concerning the total number of new and in-place connections subject to the CSG, and the percentage connected within the appropriate timeframe (refer Tables 5.8 and 5.9). From the March to December quarters of 1999, Primus consistently connected only 30 per cent of new services within the relevant timeframe. These results are well below public expectations despite the relatively few requests for connections subject to the CSG. In the March quarter 2000, Primus had a significant increase both in the number of requests and its compliance with the Standard. In the March quarter 2000 Primus was connecting 85 per cent of the requests for new services within the specified timeframe. Primus' improved performance for new service connections was mirrored by its performance for in-place reconnections.

<sup>25</sup> ACA, *Telecommunications Performance Monitoring Bulletin – Issue 12 – March 2000 quarter*, Melbourne, 2000, p. 8.

**TABLE 5.8: PRIMUS—PROVISION OF NEW SERVICES REQUIRED BY THE CSG STANDARD, MARCH QUARTER 1999 TO MARCH QUARTER 2000**

Quarter	Number	% by CSG timeframe
Mar-00	1034	85%
Dec-99	37	30%
Sep-99	66	30%
Jun-99	60	30%
Mar-99	45	31%

Source: ACA, *Telecommunications Performance Monitoring Bulletins Issues 8–12*.

**TABLE 5.9: PRIMUS—PROVISION OF IN-PLACE SERVICES REQUIRED BY THE CSG STANDARD, MARCH QUARTER 1999 TO MARCH QUARTER 2000**

Quarter	Number	% by CSG timeframe
Mar-00	443	88
Dec-99	48	24
Sep-99	34	31
Jun-99	28	31
Mar-99	44	25

Source: ACA, *Telecommunications Performance Monitoring Bulletins Issues 8–12*.

Primus subcontracts all access line fault repairs to Telstra, but provided some data concerning dial code and over-ride difficulties. By the March quarter 2000, it was able to clear all faults within one working day,<sup>26</sup> whereas in previous quarters it was able to clear only approximately 30 per cent.

## AAPT

AAPT provides information concerning the total number of fault repairs quarterly for its business and residential customers. The results indicate that 50 per cent of the 208 faults reported were repaired within three working days for the March quarter 2000. Given that three working days is the longest timeframe for repairing faults subject to the CSG Standard, applying only in remote areas, and that this result is consistent with its performance in previous quarters, AAPT's performance appears substantially below public expectations of compliance.

<sup>26</sup> ACA, *Telecommunications Performance Monitoring Bulletin – Issue 12 – March 2000 quarter*, p. 21.

**TABLE 5.10: AAPT—FAULT CLEARANCE PERFORMANCE, MARCH QUARTER 1999 TO MARCH QUARTER 2000**

Quarter	Percentage of faults cleared by:		Total faults
	One working day	Three working days	
Mar-00	33%	50%	208
Dec-99	39%	49%	295
Sep-99	30%	52%	585
Jun-99	43%	59%	476
Mar-99	23%	41%	196

Source: ACA, *Performance Monitoring Bulletins Issues 8–12*.

## CUSTOMER SERVICE GUARANTEE AS A REGULATORY TOOL

The Customer Service Guarantee has provided an effective focus for regulatory and industry efforts to improve performance in core areas of concern. It has also provided a useful basis on which consumers can judge whether they have received reasonable service, and on which the community can judge industry-wide performance.

However, there is some evidence that regulatory tools such as the CSG can have unintended consequences for service levels and competitive conduct.

Telstra's submission to the Inquiry noted:

*Quality regulation runs the risk of placing an artificial premium on monitored attributes and reducing the relative net value (to the carrier) of those attributes still demanded by customers but unmonitored by regulators. Such bias encourages inefficient reallocation of resources away from other service attributes to those attributes identified by regulators.<sup>27</sup>*

Telstra argues that by focussing on the regulated aspects of service, the CSG has the tendency to draw company resources away from unregulated aspects of service which may be of equal or greater importance to some consumers. Telstra has argued that only about 30 per cent of its total requests for service connections are regulated under the CSG, while only 13 per cent of its fault repair work is regulated.

The trend towards diversification of consumer preferences suggests that common service standards and expectations will be less easy to identify. It is reasonable to question, therefore, the extent to which quality of service regulation will be capable of reflecting those diverse preferences in the future. Such regulation could in fact prevent the market from meeting niche needs.

<sup>27</sup> Telstra, submission, p. 46.

CWO<sup>28</sup> and Telstra<sup>29</sup> both argued that the CSG can also act as a barrier to market entry, particularly in regional markets. CWO noted that new competitors face significantly different circumstances than an incumbent. Their infrastructure and workforce will tend to be less developed, while they will seek significant connection activity as they build market share. By contrast, an incumbent has a mature and ubiquitous access network and its service interactions are based more on incremental changes in their customer base.<sup>30</sup>

CWO also argued that the costs of complying with the CSG may reduce the attractiveness of markets that might already have limited commercial prospects.<sup>31</sup>

These costs will be proportionally higher for new entrants and exacerbated in a regime subject to regular change.

The Inquiry also notes that some existing CSG standards find their basis in commitments made by Telstra under its universal service plan. The Telecommunications Industry Ombudsman noted that many of the timeframes of the CSG Standard draw on early AUSTEL assessments of Telstra's performance under the USO and even internal Telecom benchmarks.<sup>32</sup>

With the prospect of a number of new entrants offering alternative access services using network technologies substantially different from those of Telstra, there must be some question regarding the appropriateness of applying common performance standards across all providers.

#### **FINDING**

**The Customer Service Guarantee has focussed service provider performance on the key areas of connection and fault repair, however:**

- ▶ **by setting standards for some service interactions, it places incentives on providers to shift resources to those areas and potentially away from other services considered important by consumers;**
- ▶ **by raising the cost of participating in the telecommunications market, it may limit competitive entry, particularly in less commercially attractive markets; and**
- ▶ **it appears to be based largely on an assessment of reasonable performance by Telstra given its existing network, thus establishing potentially inappropriate standards for other providers using alternative delivery platforms and with different patterns of service interaction.**

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28 CWO, submission, p. 14.

29 Telstra, submission, p. 48.

30 CWO, submission, p. 9.

31 CWO, submission, pp. 14, 15.

32 Telecommunications Industry Ombudsman, submission, p. 10.

## OTHER PERFORMANCE ISSUES

### INFRASTRUCTURE

The Inquiry found a range of issues relating to CAN infrastructure and exchanges in some areas. These include:

- ▶ ageing or degraded cables subject to recurrent faults;
- ▶ ‘temporary’ cabling solutions which have remained in place for many months or years;
- ▶ exchanges where new or additional lines are either not available or specific service features cannot be accessed; and
- ▶ inaccurate cable mappings and attendant liabilities for damage.

Over two-thirds of submissions to the Inquiry expressed concerns about service performance of the fixed network, including old or degraded cables where services were regularly lost due to rain or were subject to other recurrent problems. These problems were reported not only in rural and remote areas, but also urban areas.

*In simple terms, we have had a problem for 15 years. When it rains, the line dies. We keep getting told it is going to be fixed but nothing happens... And this is **not** in some rural part of Australia. We live less than 5 kilometres from Parliament House.<sup>33</sup>*

Telstra has acknowledged that currently the CAN displays a large variation in fault performance both geographically and seasonally. Information provided by Telstra to the Inquiry indicates that 16 per cent of Telstra’s approximately 71 000 distribution areas experience fault rates in excess of 20 per 100 services in operation (SIO) per year.<sup>34</sup> This is well above the eight or nine faults per 100 SIO per year which the ACA considers to represent best practice.<sup>35</sup>

The Telstra data also suggests that customers in regional, rural and remote areas are much more likely to experience high fault rates than metropolitan customers. Forty per cent of distribution areas in the country experience faults rates in excess of 20 per 100 SIO per year, compared with 10 per cent for metropolitan distribution areas.

Data provided by Telstra also suggests that regional Queensland and New South Wales experience higher rates of faults than other areas of Australia. By contrast, Western Australia, Victoria, South Australia, Tasmania and the Northern Territory all have fault rates at, or below, the national average and with less variation. Further data regarding fault rates is at Appendix D.

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33 Daryl Powell, submission, p. 1.

34 A distribution area is a customer area fed by a network distribution element such as a pillar, cabinet or main cable direct feed. A distribution area will typically have several hundred services but can range from tens to thousands.

35 ACA, *Investigation of Telstra’s Performance Under the CSG Standard and the USO*, p. 20.

Telstra has advised that half of its network is older than 20 years—its expected lifetime when constructed—while 30 per cent has been in operation for over 30 years.<sup>36</sup> Some two million customers are still served with older cabling that is three times as susceptible to weather-induced failures.

In addition to reliability issues, a number of submitters expressed dissatisfaction that they are unable to access enhanced call features such as call waiting and call diversion.

*Our exchange was upgraded, leading us to believe we now had an exchange which would give us full facilities for many years. That proved to be incorrect. We were upgraded, but not to a new exchange and now find ourselves unable to access many of the services our neighbours can.*<sup>37</sup>

A number of issues dealing with cabling were also raised. The Inquiry heard of ‘temporary’ cabling remaining in place for months or years; cabling laid above-ground alongside electric fences, in areas where stock movements occurred, or in areas of known high lightning activity.

*There are still numerous locations in Guyra Shire where telephone cabling is laid above ground (through paddocks, in gutters and drains and the like). This cabling is susceptible to damage and lightning strikes...*<sup>38</sup>

Other submissions claimed that front-line staff often lacked knowledge of exchange capabilities or cabling routes. Respondents spoke of being given connection dates for new lines when their local exchange had no spare lines. It was also claimed that cable mapping records were often inaccurate, leaving buried cables vulnerable to being inadvertently cut. Contractors or landowners were allegedly held responsible for the cost of restoration of cut cables—even if incorrect advice had been received about their location.

*I believe that the current services relating to Telstra’s cable locations are totally unacceptable. Firstly, there are long delays in the provision of maps showing cable locations. Secondly, the maps supplied are often at a scale that is not practical, and do not provide enough information (e.g. distances from public roads) to quickly and accurately pinpoint cable location. Thirdly, the maps that are supplied are, in some cases, inaccurate in that they do not show the location of all cables.*

*[W]e are reluctant to attempt to locate cables ourselves due to the penalties associated with damage to Telstra cables*<sup>39</sup>

In advice to the Inquiry, Telstra acknowledged that cable plans made available through its Dial Before You Dig service provide ‘plant presence advice, not exact location’. Telstra indicated that, for rural property holders:

*[It] takes a...sympathetic view and will often assist with site identification and advice particularly where the exact location of the network might not be apparent. Whilst provision is made for charging on costs, a balanced view is usually taken by the local Telstra managers who are there to assist.*<sup>40</sup>

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36 Telstra, submission, p. 15.

37 Julie Searle, Kerry Watters for the Brentwood community, submission, p. 1.

38 Guyra Shire Council, submission, p. 2.

39 Stewart McGee, submission, p. 1.

40 Telstra – Inquiry communication.

There appears to be some discretion at the local level in responding to the concerns of property owners and contractors. While in some cases the approach taken may be sympathetic and helpful, evidence before the Inquiry suggests this is not always the case.

#### FINDING

Evidence available to the Inquiry suggests that localised telephony reliability problems exist in Telstra's network.

Current practices concerning the provision of advice to the public about cable locations are ineffective and result in high levels of frustration for those affected.

## CUSTOMER SUPPORT SERVICES—CALL CENTRES

Front-line customer support services were the subject of comment in approximately a quarter of all submissions received by the Inquiry and identified as the source of much customer dissatisfaction and frustration.

Comments were overwhelmingly related to Telstra and the bulk of them were negative. A small number of submissions also expressed negative views on CWO's customer service processes.

Call centres were frequently seen as remote and their staff either disinterested in, or ignorant of, local conditions including time and distance considerations. Where a problem was not resolved, customers often had to start the process again with a different call centre person.

*The absolute bungling of the processing of the complaint—appointments not kept, loss of records, denial appointments were ever made, signing off the case when nothing had happened, having to go to the bottom of the list and start again, giving of incorrect complaint numbers on several occasions.<sup>41</sup>*

*Complaints are trivialised, service to its [Telstra's] customers is given grudgingly, while its staff give an overall impression that the customer is a damn nuisance. There are exceptions to this norm...but generally, the customer and complaint are treated with disdain.<sup>42</sup>*

## CUSTOMER SUPPORT—TECHNICAL SERVICES

Another common theme related to delays in fault repair attributed to work allocation systems—jobs did not appear to be allocated logically and technicians often lacked information about service history. However, submissions which addressed the issue of technical competence often spoke favourably of the efforts of Telstra's staff.

*I must also add that none of these technicians who have come to us—they've all been very honest, sincere and hardworking people, they really have. They have absolutely done their best.<sup>43</sup>*

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41 Dianne Hanna, submission, p. 1.

42 Brian Lamprell, submission, p. 4.

43 Anne Martin, Wagga Wagga roundtable meeting, 25 August 2000.

Also of concern to some submitters was the withdrawal of local technical staff and/or their replacement with contracted personnel. Since call centre staff are unlikely to know the precise nature of the fault, there was potential for jobs to be assigned to the wrong contractor.<sup>44</sup>

*[With] that sort of splitting up of the workforce that occurs with contracting out, and that fracturing of the skill base, you create inefficiencies and that's going to have more impact in remote and rural areas than it will in the city.<sup>45</sup>*

*A lot of Telstra's records of where their plant is and the state of the customer access network and how many pair gain systems they have got is very incomplete. The organisational centralisation has taken place ahead of the actual getting of the systems up—the data which would record all that information and allow it to be sort of centrally available to people, dispatching job orders.<sup>46</sup>*

The Inquiry was told of problems that seemed to be caused by contracted service arrangements. In particular, a number of submitters expressed frustration at arrangements for repair and installation of customer equipment now managed by PlesTel.<sup>47</sup> PlesTel has advised the Inquiry that co-operative service arrangements (whereby Telstra and PlesTel sub-contract each other's technicians in remote areas where only one company has a presence) are currently under consideration.<sup>48</sup>

## LOCAL CALL ZONES

The Inquiry found five broad concerns with Telstra's current call zoning arrangements. Two of these—that of the experiences of people without untimed local calls or without untimed local call access to their Internet provider—are dealt with in Chapters 6 and 7.

The remaining three issues were:

- ▶ the arbitrary nature of zone boundaries;
- ▶ changing demographics; and
- ▶ individual preferences.

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44 Kevin Beck, Melbourne roundtable meeting, 5 June 2000.

45 Rosalind Eason, Communications, Electrical, Plumbing Union, Melbourne roundtable meeting, 5 June 2000.

46 Rosalind Eason, CEPU, Melbourne roundtable meeting, 5 June 2000.

47 Geoff Bushby, Irrungadji Aboriginal Group, Port Hedland roundtable meeting, 8 June 2000.

48 PlesTel – Inquiry communication.



## CURRENT LOCAL CALL ZONE ARRANGEMENTS

Telstra's zoning system was introduced in 1960 and determines which calls are classified as local and which are national long distance, Pastoral or Community, therefore attracting timed charges. All telephone numbers are grouped into zones, as determined by the location of the local exchange.<sup>49</sup> Most of Telstra's 10.2 million fixed telephone services are located in standard zones in reasonably populated areas of Australia. Calls within a standard zone, or to adjoining standard zones, are untimed local calls. Access to the same local calling capability as existed in 1991 is legislatively guaranteed for people living in standard zones by the *Telecommunications (Consumer Protection and Service Standards) Act 1999*.

Extended zones are found outside Telstra's standard zones and cover 80 per cent of Australia's landmass. There are 111 extended zones containing 39 500 services in operation.<sup>50</sup> Each extended zone may contain one or more 'inner extended zones' as well as the 'outer extended zone.' Inner extended zones are generally connected to the network by copper cabling and customers have access to untimed local calls within that zone. Outer extended zones are mostly served by digital radio concentrator systems and do not have access to untimed local calls. Telstra claims that limited infrastructure requires timed call charges to avoid congestion.<sup>51</sup>

Each extended zone also has access to a 'Community Service Town' as designated by Telstra in a standard call zone for medical, public utility, banking and other services. An extended zone can have two Community Service Towns. Currently a 'Pastoral rate' of 25 cents per five minutes is charged for calls between outer extended zones, between inner and outer extended zones, or to the Community Service Town.

The Inquiry found that there is dissatisfaction with the current call zone boundaries, often appearing arbitrary and outmoded. A number of submissions from country towns compared their local call access unfavourably with that of neighbouring towns with similar populations. Some cited neighbouring rural properties having local call access to different areas—a problem that will be found wherever zone boundaries are drawn.

Call zoning was as much an issue in metropolitan submissions as those from country areas. The system was considered out of touch with recent demographic changes, particularly the significant urban sprawl in capital cities. Customers in outlying suburbs of cities like Melbourne, Sydney and Perth face timed call charges to their city centre.

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49 Telstra, *Zoning Review Project*, [www.telstra.com.au/zoning\\_review](http://www.telstra.com.au/zoning_review).

50 DOCITA, *Untimed Local Calls for Remote Australia – Factsheet*, [www.dcita.gov.au](http://www.dcita.gov.au), 11/4/00.

51 DOCITA, *Untimed Local Calls for Remote Australia – Factsheet*.

*There are several outer suburbs that lie appreciably further from the Perth CBD than Mt. Helena that are furnished with local untimed calls to Perth, but Mt. Helena, lying closer is still denied this facility!<sup>52</sup>*

*Where we live is now considered to be in the metropolitan area and we are even included in the White Pages directory, but we still pay STD rates.<sup>53</sup>*

Demographic and regional economic changes have also affected rural and remote areas, particularly in relation to the availability of key community and business services in country towns. While the advent of 1800 and 13 numbers has kept down the cost of accessing many services, some submitters indicated that increasingly they must make a timed call to contact businesses which used to have a local presence.

*The local call zoning in our area is totally out of step with modern business practices. We are now unable to contact most businesses and services on a local call, as [the call zoning system] originally intended, prior to the massive decline in rural services and business.<sup>54</sup>*

Even in situations where Telstra provides untimed local call access to the most suitable town from a community's viewpoint, individual preferences will still leave some consumers dissatisfied. The Inquiry was made aware of a number of these cases.<sup>55</sup> People may have relatives or friends in, or prefer to use a particular service from, an alternative town.

#### **FINDING**

**Demographic changes since the introduction of the existing call zoning system have affected the ability of many customers to access core business and community services at an untimed rate.**

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52 Philip S. Harris, submission, p. 2.

53 B. Spouge, submission, p. 1.

54 Canary Islands Appin South Road Users, submission, p. 2.

55 An example of this is M.B. & G.A. Murray, submission, p. 1.

# TELSTRA INITIATIVES

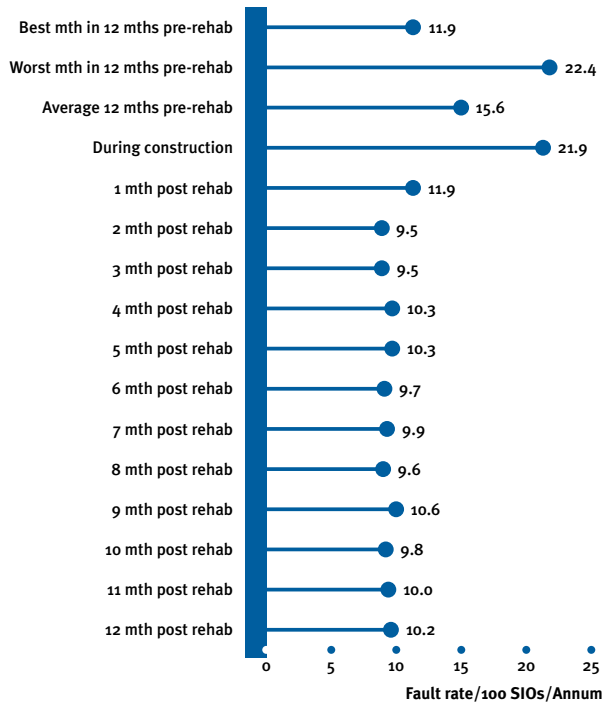
## THE CUSTOMER ACCESS NETWORK RENEWAL PROGRAM

The Inquiry received information from Telstra on an infrastructure investment program to improve the performance of the network.

This Access Renewal program has a budget of at least \$700 million per annum over three years until 2001-02. Funds of \$727 million were allocated for 1999–2000, with Melbourne, Brisbane and Sydney attracting just under half of the funding. Telstra will upgrade the areas worst affected by faults or congestion. Investment in the major capital cities is required to meet the demand for additional lines.

The Inquiry was provided with information regarding the impact of the rehabilitation of the access network. Preliminary results, shown in Figure 5.5, indicate that upgrades undertaken so far have been able to reduce faults from an average of 15.6 to around ten per 100 SIO per annum.<sup>56</sup> The fault rate rises during construction then declines substantially. The ACA believes that fault rates of close to world's best practice—eight or nine faults per 100 SIO—could be achieved.<sup>57</sup>

**FIGURE 5.5: IMPACT OF CAN REHABILITATION ON THE INCIDENCE OF FAULTS**



Source: Telstra – Inquiry communication. Based on all areas rehabilitated up until May 2000.

<sup>56</sup> Telstra – Inquiry communication.

<sup>57</sup> ACA, *Investigation of Telstra's Performance Under the CSG Standard and the USO*, p. 20.

In addition to reducing fault rates, the upgrade will result in fewer new connections being classified as ‘not readily accessible to infrastructure’ under the CSG—thus overall connection times will be reduced.

The architecture of the network will be redesigned to make it easier for technicians to connect new services. Technicians only need access to non-critical areas of the infrastructure for day-to-day connections and repairs, so technician-induced faults will be less of a problem.

The upgrade will take place in areas identified on the basis of a range of factors such as existing capacity for new lines, growth forecasts, faults, and revenue. Telstra was initially targeting complete distribution areas, but is now selectively identifying blocks of 100 services within each area. The target for the program’s life until 2000/01 is to rehabilitate 25 per cent of the approximately 71 000 distribution areas that are most in need of attention. By April 2000, 5.4 per cent had been upgraded.

To more easily pre-assign plant and cable, Telstra is also undertaking an audit of cable pairs to record lead-in cables and distribution cable down to the final distribution point.<sup>58</sup>

Organisations such as the Australian Telecommunications Users Group (ATUG) and the ACA believe the CAN upgrade will be one of Telstra’s key initiatives in improving service quality. ATUG’s submission stated that the CAN program, ‘using new and highly reliable construction practices, will dramatically improve provisioning times and service reliability.’<sup>59</sup>

#### FINDING

Upgrades to aspects of Telstra’s existing infrastructure are needed to address new connection and fault rate issues. Telstra’s Access Renewal program has to date delivered some quantifiable improvements in performance.

## OTHER MEASURES TO IMPROVE WORK PRACTICES

### ‘TOMORROW PLAN’

The ‘Tomorrow Plan’, is focussing on Work Management Centres in rural and remote regions which manage the planning and allocation of support work. This is intended to ensure sufficient staff are available in the right locations to meet forward commitments and daily schedules.<sup>60</sup>

### 1-800-R-RADIO

In October 1998, Telstra established a CAN Electronic Management Centre (CEMC) for services using technologies other than copper (for example, radio concentrator services). CEMC includes a Radio Customer Support Centre ‘1-800-R-RADIO’ that serves around 28 000 Telstra customers living in remote areas using radio and satellite networks. This service appears to be well regarded:

*People are a bit cynical about Telstra restructuring in order to service the bush better. However, they do do some things that have worked better, and one example is that 1800 radio centre that services people on digital radio concentrator systems.*

58 ACA, *Investigation of Telstra’s performance under the CSG Standard and the USO*, p. 21.

59 Australian Telecommunications Users Group, submission, p. 3.

60 Telstra, submission, pp. 39, 40.

*ICPA, the Isolated Children's Parents' Association, lobbied them for that and they've set that up; and I have heard quite a number of people who've said that that is a much better service. Rather than that business where you go, "Press five for so-and-so, then four, then six," then whatever, you get on to someone who has got some experience in the area, who is actively trying to help.<sup>61</sup>*

## CALL CENTRES

Telstra's call centre processes are also under review to address some acknowledged problems:

*Currently when a customer contacts Telstra, not all information about the transaction can be shared across the business.*

*Telstra acknowledges the frustration this can cause and has developed a Customer Care Strategy to enhance our service. In 1999, Telstra implemented a program, at a cost of over \$50 million, to upgrade its record keeping system across the country to improve reliability and to develop a Customer Contact History System. This will enable Telstra staff throughout the business to better understand and assist with customer requests ... Customers will benefit from the improved approach because staff will be better deal with inquiries and will strive to resolve their issue on the spot, first time, every time. Our approach will reduce the multi-handovers customers sometimes experience.<sup>62</sup>*

Telstra has also advised that:

- ▶ new delegations have been implemented giving sales consultants greater authority to provide a solution at the first point of contact instead of referring it to a supervisor;
- ▶ lines of business are being integrated to provide easier access for customers and to reduce the number of handovers from one consultant to another;
- ▶ measures are being implemented to ensure that if Telstra cannot deliver a product or service to a customer, the customer is contacted and/or given a single point of contact until the problem resolved; and
- ▶ call centre performance measures are being re-examined to ensure they cover customer satisfaction.<sup>63</sup>

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61 Chris Capel, Queensland Rural Women's Network, Longreach roundtable meeting, 20 June 2000.

62 Telstra – Inquiry communication.

63 Telstra – Inquiry communication.

## TELSTRA'S REGIONAL STRUCTURES AND SERVICES

Telstra Country Wide is a new regional business unit responsible for some three million consumers in regional, rural and remote Australia, some \$3.5 billion in annual revenues, 8 000 staff, and 29 area offices grouped into four broad regions. It is expected to be fully operational by the end of 2000.

Telstra advised the Inquiry that the initiative seeks to bring back local management into regional Australia with Area General Managers being the key elements in the new organisation:

*The roles of the Area General Managers will include dealing with local complaints, achieving sales targets, managing costs within the area and identifying investment priorities.*

*Area General Managers will also work in local communities to hire and train technical contractors, authorised agents and communications consultants. These will largely be part time contracts in small communities of 500 to 5000 people...<sup>64</sup>*

Country Wide will manage most revenues from its customer base and establish agreements with other business units of Telstra for the provision of services. Country Wide will also be able to source services and providers externally, and enter into joint ventures or partnerships. Local tradespeople will be trained to undertake non-complex fault repair and maintenance, and a network of authorised agents established in remote locations. In particular, agreements have been established for contractors to coach local people in 18 mainland and island Indigenous communities.

In a move to address consumer frustration with the lack of awareness of call centre staff about the local circumstances of callers, Telstra has set 'a target level of 75 per cent of calls answered in a relevant region can be achieved without loss of efficiency or [incurring] additional cost.'<sup>65</sup>

The Inquiry identified the provision of Easycall<sup>®</sup> features as a concern for many customers in regional, rural and remote areas. Telstra Country Wide advised the Inquiry that it:

*is looking at options to deal with this issue and believes it will be in a position to make an announcement shortly.<sup>66</sup>*

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64 Telstra – Inquiry communication.

65 Telstra – Inquiry communication.

66 Telstra – Inquiry communication.

#### FINDING

Concerns were identified in relation to Telstra's customer service interactions, particularly in regional, rural and remote Australia. Evidence collected by the Inquiry highlighted the need for:

- ▶ greater engagement with consumers, both in undertaking effective, local consultation and in providing candid and open information about network and service plans;
- ▶ processes that allow customers to feel they have some control over their interactions with their provider, enabling them to monitor and participate in the management of their service concern and limiting the necessity to explain their issue anew at each contact;
- ▶ front-line staff to have an understanding of the circumstances of the customer (particularly their geographic location); and
- ▶ Telstra to accept greater responsibility for assisting customers to get the most out of their telecommunications service (through, for example, objective and knowledgeable advice both about service options and regarding technical issues).

The success of Telstra's Country Wide initiative will be judged on the extent to which it addresses these issues in the short to medium term.

## TELSTRA'S ZONING REVIEW

Telstra has established a review of its call zoning arrangements. Telstra has advised the Inquiry that it has identified a number of options, including: changing the geographic boundaries of zones; moving to zoning based on individual customer locations; increasing the size of call zones; allowing different regional business or service centres to be selected; providing local call access to the Internet where this is not available; changing the tariffing system; or altering the call band system.

Telstra is scheduled to publicly announce its recommendations in November 2000.

Rapid technological and market developments—such as competition in local calls from CWO, resellers of Telstra's local call service and new players offering satellite and wireless solutions—are likely to force Telstra to examine alternate arrangements to better meet consumer needs. The Australian Competition and Consumer Commission's decision to grant access to other carriers to Telstra's local loop infrastructure will further drive such competitive pressures.

A regulatory solution would not in the Inquiry's view be effective in addressing the local calling issues identified earlier in this chapter. Adjustments to call zone boundaries might merely shift the inconsistencies of the existing system and fail to address the increasing demand by customers for tariffs which suit their personal circumstances.

#### FINDING

Telstra's review of its call zoning system is welcome and the Inquiry encourages Telstra to consider new tariff options more closely tailored to individual preferences.

The Inquiry acknowledges the programs Telstra has developed in recent times to improve its service levels. The issues these programs seek to address appear to be the core areas of concern raised with the Inquiry.

## ACA'S QUALITY OF SERVICE POWERS

The ACA has various legislative mechanisms to ensure the ongoing adequacy of telecommunications services. Its broad powers allow it to direct a telecommunications provider in connection with performing its telecommunications functions or exercising any of its powers. It also has specific powers to direct a telecommunications provider concerning contravention of the CSG Standard, contravention of carrier licence conditions, breaches of service provider rules and compliance with industry codes.

The ACA also has other powers, including monitoring the performance of the industry, conducting investigations and obtaining information from providers.

## ADMINISTRATION OF POWERS

The ACA advised the Inquiry that its quality of service investigation framework has three broad elements.

The first element comprises the ACA using a number of sources of information to identify potential issues that may adversely affect the ongoing adequacy of telecommunications services in Australia. These include:

- ▶ complaints from consumers received through the ACA's regional offices;
- ▶ access to complaint data from the TIO and the Commonwealth Department of Communications, Information Technology and the Arts;
- ▶ regular consultations with the TIO;
- ▶ membership of the Consumer Protection Agencies Liaison Group;
- ▶ membership of consumer consultative committees; and
- ▶ monitoring of industry performance.

The second element involves investigation. The ACA normally holds discussions with the telecommunications provider to offer the opportunity to supply information and data to help it determine whether to resolve, refer, or proceed with the matter. The ACA has extensive powers under Parts 25 and 26 of the *Telecommunications Act 1997* to undertake investigations or public inquiries into issues of concern.

The third element concerns resolution of issues. The ACA has a number of possible courses of action where it concludes that a provider is failing to perform adequately, including:

- ▶ informal consultation with telecommunications providers;
- ▶ formal warnings where the ACA considers that there has been a breach of standards;
- ▶ direction to providers where the ACA considers there has been significant non-compliance with the CSG Standard or an industry code; and
- ▶ taking the matter to the Federal Court in cases where the ACA believes the conduct warrants formal punishment.



The ACA has, in recent times, undertaken two key investigations which illustrate its approach to quality of service issues. In August 1999, it reported on its investigation of Telstra's performance against the CSG and USO Standards. This investigation was triggered by a significant decline in Telstra's performance for connecting new services to sites that did not have available infrastructure in urban and major rural areas. The ACA considered Telstra's remedial actions to be generally appropriate but it had concerns about the timeframes for their implementation. The ACA continued to closely scrutinise Telstra for six months to ensure that strategies were implemented and performance improved. It recently confirmed that sustained performance improvements had occurred and that intervention would not be necessary.<sup>67</sup>

In March 2000, the ACA published a Special Report on Telstra's USO for payphones. The ACA reviewed Telstra's first universal service plan in 1998. A subsequent examination of Telstra's compliance with the payphones USO reviewed the quality of the payphone service and consumer satisfaction. The ACA concluded that there were issues of concern but suggested that improvements were being made. Nonetheless, the ACA undertook to continue to closely monitor the quality of payphone performance.

It is important that a regulator carefully balance the costs and benefits of intervention. The use of powers of direction to require performance improvement that incur significant costs may not be in the community's interest. Similarly, if it were to require specific changes in conduct, there may be unintended consequences that impose costs on the provider which would be passed on to users.

In this regard, the ACA is undertaking research to establish both the incremental cost and consumer benefits of improved performance against the CSG.<sup>68</sup> This will assist in determining whether there would be a benefit to the community in forcing providers to improve performance against the CSG, or whether the existing CSG standards remain appropriate.

## RELIABILITY MEASURES

While the Inquiry has identified concerns regarding reliability in some parts of the telecommunications network, there appears to be no current process for the ACA to monitor fault rates or other reliability measures at a disaggregated level and on a ongoing basis. This is in contrast to utilities such as electricity, gas and water. The Productivity Commission's *Performance of Government Trading Enterprises 1991–92 to 1996–97* provides analysis of such standards for service quality.<sup>69</sup>

Some of the performance criteria in Telstra's Universal Service Plan are reliability criteria—for example, that consumers will have the ability to originate or terminate calls (as indicated by the presence of a dial tone) 99 per cent of the time over a continuous 12 calendar month period.<sup>70</sup> However, there appears to be no established processes to measure reliability at an appropriately disaggregated level to identify recurrent, localised network performance issues.

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67 ACA Media Release, *ACA Finds Telstra's Customer Service Performance is on the Rise*, 31 August 2000.

68 ACA – Inquiry communication.

69 Productivity Commission, *Performance of Government Trading Enterprises 1991-92 to 1996-97*, October 1998.

70 Telstra, *Universal Service Plan*, p. 11.

The Inquiry is satisfied that the ACA has adequate powers and processes in place to investigate significant issues and develop appropriate methods of resolution. However, while the ACA's present monitoring and reporting regime results in an adequate overview of the industry's performance against the broad CSG and USO targets, it does not adequately identify issues concerning reliability of infrastructure or chronic localised problems.

#### FINDING

The regulatory powers afforded by legislation provide a suitable framework for the ACA to address quality of service issues. It is in the administration of those powers that inadequate focus appears to have been placed on monitoring, identifying and investigating performance issues associated with the reliability of telephone services and extreme failures to meet customer service guarantee performance standards.

## PAYPHONES

Under the USO, the universal service provider is required to ensure that payphones are reasonably accessible to all people in Australia on an equitable basis, wherever they reside or carry on business. Currently, Telstra is the sole universal service provider of payphone services. Limited competition exists in the provision of payphone services.

The payphone market can broadly be divided into:

- ▶ Telstra owned and operated payphones, including telephone typewriter (TTY) payphones;
- ▶ Telstra owned and customer-operated payphones; and
- ▶ competitor owned payphones.

**TABLE 5.11: TOTAL PAYPHONES PROVIDED**

	1994–95	1995–96	1996–97	1997–98	1998–99	June 2000
Telstra operated	36 970	37 049	37 362	36 760	36 333	36 481
Public TTY	–	–	70	71	88	145
Customer operated	45 793	45 153	44 335	42 019	42 432	41 659
Total payphones	82 763	82 202	81 697	78 850	78 853	78 285

Source: ACA, *Special Report No. 5 – March 2000*; Telstra.

Access to public telephones is important to most Australians and a priority for remote Indigenous communities and people on low incomes, but has little application in a business context.

At present, Telstra operates a number of different types of payphones including Smart payphones, coin only, phonecard only, and coin/phonecard combination telephones. Telstra-operated payphones are accessible 24 hours per day, typically being located in public and non-public spaces e.g. shopping centres, near transport services, street corners, etc. Customer-operated payphones such as Gold and Blue payphones are usually located in non-public areas, and may not be accessible 24 hours per day. No firm figures for competitor owned payphones are available, but they are thought to number a few thousand.

## RECENT PAYPHONE PERFORMANCE

Payphone availability is defined as the number of payphones available to make successful calls using either phonenumber or coins to emergency 000, 1800 and other carrier services. Serviceability relates to the percentage of payphones that are fully functional at any given time.<sup>71</sup>

In order for a payphone to be certified as fully functional, it must meet the following criteria:

- ▶ transmission and reception are adequate for a normal conversation; and
- ▶ successful insertion of coins or cards; connection to the required number; and return of unused coins or cards when the call is terminated.<sup>72</sup>

Telstra's performance (as reported by the ACA) has improved over the period March 1999 to June 2000. Availability improved from 96 per cent to 98 per cent, serviceability improved from 85 per cent to 93 per cent, and repair times decreased from 36 hours to 29 hours.<sup>73</sup>

Telstra advised the Inquiry that the improvements in recent payphone performance are largely attributable to the implementation of a number of initiatives including deployment of a payphone fault reporting number; increases in remotely managed payphones; more efficient coin collection; and targeting of high theft and vandalism areas.

## MAIN THEMES ARISING FROM THE INQUIRY'S CONSULTATIONS

The Inquiry identified three key areas of concern:

- ▶ faults, including timeframe for repairs, vandalism, problems with coin insertion and general maintenance;
- ▶ access to payphones, including the location of phones and the availability of the service, particularly for Indigenous communities and low-income earners; and
- ▶ issues relevant to people with disabilities, such as the height of payphones; volume control dials; hearing-aid compatibility; braille keypads; further penetration of TTY payphones; and cut-away booths hazardous to the vision impaired.

### FAULTS

The reliability of public payphones is a major issue for consumers who rely on this service. Generally, comments on payphone faults related to the time taken to make repairs, vandalism and problems associated with paying with coins. The Inquiry notes that some of the issues (e.g. vandalism and theft) are to a degree beyond Telstra's control.

### ACCESS TO PAYPHONES, LOCATION AND AVAILABILITY OF THE SERVICE

Under the USO, Telstra must make payphones reasonably accessible. Telstra's determination of what is reasonable may not always accord with the community's expectations.

Some submissions from regional and rural areas noted the lack of availability of payphone services, particularly where payphones had been damaged and not replaced.

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71 Australian Communications Authority, *Special Report No. 5 – March 2000 – Payphones*, p. 30.

72 ACA, *Special Report—Payphones*, p. 30.

73 ACA, *Special Report—Payphones*, p. 30; Telstra, *Quality of Service Report—June 2000 Quarter*.

The Inquiry understands that a Ministerial Direction was issued to Telstra in April 2000. The direction required Telstra to vary its universal service plan in a number of ways including enhancing consultation processes regarding payphones and clarifying timeframes for responding to requests for new payphones and making installations where those requests are approved.<sup>74</sup> Telstra's amended plan has not yet been approved by the Minister.

In remote areas, especially in Indigenous communities, lack of payphone access is a significant issue. The Aboriginal and Torres Strait Islander Commission's (ATSIC) submission to the Inquiry cites an Australian Bureau of Statistics (ABS) report, *Housing and Infrastructure in Aboriginal and Torres Strait Islander Communities*, which found that less than half of Indigenous communities with populations of more than 50 people have access to at least one public payphone.<sup>75</sup>

Material supplied by Telstra to the Inquiry raised concerns about the payphone information collected by the ABS concerning Indigenous communities.<sup>76</sup> Telstra questioned the survey design and methodology on the basis that there had been no industry input or consultation. ATSIC has acknowledged some of these concerns.<sup>77</sup>

However, the Inquiry found that there is a need for improved payphone services. Given the particular telecommunications requirements of remote Indigenous communities, the Inquiry questions the extent to which the USO, which is based on the broader requirements of the Australian community, can address those needs.

ATSIC suggested that some form of 'cashing out' of benefits for government services be examined, with a view to providing more targeted solutions for those communities. ATSIC noted that this has occurred in other areas such as health care. ATSIC acknowledged that there are complex policy issues that would need to be considered should such a model be pursued.<sup>78</sup>

#### **FINDING**

**It is questionable whether the USO meets the particular communications needs of remote Aboriginal and Torres Strait Islander communities.**

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74 *Telstra Corporation Limited—Variation of Universal Service Plan Notice No. 1 of 2000*, 3 April 2000, p. 3.

75 Australian Bureau of Statistics, *Housing and Infrastructure in Aboriginal and Torres Strait Islander Communities*, Canberra, 1999.

76 Telstra – Inquiry communication.

77 Aboriginal and Torres Strait Islander Commission – Inquiry communication.

78 ATSIC – Inquiry communication.

## ISSUES RELEVANT TO PEOPLE WITH DISABILITIES

The design of payphones, including volume controls and hearing-aid compatibility, is important to people with disabilities.

*[M]ost public phones are not able to be accessed by people with disabilities. They physically can't reach the handsets if they're in wheelchairs, the doorways are too narrow, there's no TTY [teletypewriter] hearing facilities for people that are hearing impaired.<sup>79</sup>*

Telstra advised the Inquiry that all public payphones are hearing aid compatible; around 87 per cent of payphones (including 31 700 Smart payphones) have volume control; raised buttons; raised pip on digit 5; two languages (English and Chinese); and a larger liquid crystal display screen. Approximately 145 TTY payphones have been installed across Australia. Telstra also advised that the new Smart payphone has been installed at the universal access height advised in its universal service plan, making the payphone accessible to at least 97 per cent of people in wheelchairs and 98 per cent of all Australians. Telstra indicated that consultations with the disabled community are continuing.<sup>80</sup>

The Ministerial Direction regarding Telstra's universal service plan also requires Telstra to document consultation processes and relevant criteria for the location of TTY payphones.

## DIGITAL DATA SERVICE OBLIGATION

The digital data service obligation (DDSO) ensures that all people in Australia are provided with access to high speed data services on an equitable basis. The details of the obligations are discussed in Chapter 3.

Due to its recent introduction it is difficult to comment on the adequacy of the obligation. Telstra has estimated that it has 84 subscribers to its special digital data service up until the end of the June 2000 quarter. CWO is to commence offering in 2001 special digital data services in Western Australia in accordance with its obligation.

Given the recent commencement of the DDSO provisions and approval of Telstra's Digital Data Service Plan, the Inquiry is not in a position to assess the performance of Telstra against the legislative obligations. Nevertheless, a number of issues of concern to consumers regarding these services, which are primarily used for Internet access and other data applications, are addressed in Chapter 6.

## MEASURES TO ADDRESS CONSUMERS WITH SPECIAL NEEDS

The Inquiry was asked to consider the extent to which Telstra and other carriers and service providers have established effective processes to enhance their responsiveness to disadvantaged groups (including the elderly and medical emergencies). The Inquiry identified a number of groups with special telephony needs including people with disabilities, low-income earners, and consumers requiring priority repair. Specific reference is made in the terms of reference to the needs of the elderly. Where the elderly have special requirements, they will generally be related to a disability, income or priority requirement.

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79 V. Aurisch, Dubbo roundtable meeting, 25 July 2000.

80 Telstra – Inquiry communication.

## PEOPLE WITH DISABILITIES

The *Disability Discrimination Act 1992* makes it unlawful for providers of goods, services and facilities to discriminate against a person because of his or her disability. This includes refusal to provide goods, services or facilities, or provision of those in an unfair manner. The objectives of the Disability Discrimination Act are such that service providers are obligated to provide existing services in a fair and equitable manner. It is not intended to impose unjustifiable hardship or force providers to offer services that are technically or commercially not feasible.

The Disability Discrimination Act provides for the preparation and implementation of an Action Plan by companies. The Plan, which is voluntary, can be registered with the Human Rights and Equal Opportunity Commission (HREOC).

Obligations under the Disability Discrimination Act are recognised in telecommunications legislation. The Telecommunications Act states that anyone supplying a service equivalent to voice telephony to a person with a disability must comply with all obligations that apply to a voice service under that Act. The ACA also has powers to make standards for customer equipment to be designed to cater for any or all of the special needs of people with disabilities.

The Inquiry notes the Australian Standard released in December 1999 by the Australian Communications Industry Forum, which establishes the technical requirements relating to hearing-aid couplings and tactile indicators on keypads. The Telecommunications (Consumer Protection and Service Standards) Act also established the National Relay Service (NRS). The NRS provides a range of services that enables people who are deaf or have a hearing or speech impairment to communicate with each other and other members of the community. The service is available at all times.<sup>81</sup>

Through the consultation process the Inquiry identified two main issues concerning people with disabilities:

- ▶ the design, suitability and supply of customer equipment; and
- ▶ training and public awareness regarding equipment and services for people with disabilities.

## EQUIPMENT DESIGN AND SUITABILITY

Some organisations supporting or representing people with disabilities were critical of the range of equipment and public programs available to assist their members and constituents. In particular, certain submissions claimed a growing disparity between the general level of consumer choice and product offerings and the range of disability equipment. There was a concern that the benefits of competition will be denied to people with disabilities who have specific telecommunications needs or equipment requirements.

Frustration was also expressed by some consumer representative bodies due to the lack of resources available to facilitate effective participation in consultations about equipment design and standards with either Australian service providers, equipment manufacturers or government agencies.

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<sup>81</sup> Australian Communication Exchange, factsheet, <http://www.aceinfo.net.au>, 22 August 2000.

*Non-profit organisations do not have the resources to provide consultation and professional expertise to Telstra without compensation. The expertise is, however, available.*<sup>82</sup>

During consultations, some disability advocacy groups raised the need for the universal design of equipment.<sup>83</sup> Universal design refers to the design and manufacture of equipment that enables its use by the largest possible range of users, including those with disabilities, in a variety of situations.

Australia manufactures few items of telecommunications customer equipment and is largely dependent on overseas manufacturers for the supply of equipment. Australia's ability to secure the widest possible choice of equipment to meet those needs is therefore likely to be best achieved through active participation in the setting of international standards.

A future venture between the Australian Telecommunications Industry Association (ATIA), carriers and disability groups intends to establish a national website for registering and providing details of equipment that complies with disability standards. The website will provide a source of information on additional access requirements as well as assist communication between equipment suppliers, designers and users. It also aims to become a public resource to providing a system of compliance against which consumers can make informed choices.

The ATIA stated in advice to the Inquiry that it is currently consulting with the Association of Access Engineering Specialists in the United States to participate in a cooperative responsible for developing best practices for disability access. The cooperative mainly comprises regulatory bodies and user representatives and aims to develop common methods and processes for product/service testing, evaluation protocols and technical specifications of standard accessibility features.<sup>84</sup>

Initiatives like the one proposed by the ATIA are positive steps towards addressing the equipment needs of people with disabilities and Australia needs to continue to be involved in international developments through effective participation in international consultative forums.

## EQUIPMENT SUPPLY

At present Telstra and CWO provide customer equipment and, therefore, have obligations under the Disability Discrimination Act.

Under Telstra's Disability Equipment Program customers pay the same rental charge as those renting a standard telephone, despite the higher cost of much of this equipment. Telstra also has a number of centres catering for the aged and people with disabilities where equipment is demonstrated and is available for customers to examine.

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82 Independent Living Centre of Western Australia, submission, p. 2.

83 G. Astbrink, TEDICORE, Brisbane roundtable meeting, 19 June 2000; Deafness Council of NSW Inc., submission, p. 2.

84 Australian Telecommunications Industry Association – Inquiry communication.

A Ministerial Direction to Telstra issued in April 2000 regarding its universal service plan requires it to include commitments regarding awareness raising and consultation with disability advocacy groups; clarification of aspects of the Disability Equipment Program; and new measurements to ensure assessment of that program.<sup>85</sup>

CWO has plans to offer some specialised equipment, including TTY, with a full equipment program likely to be launched early in 2001. CWO currently has some accessories for people with a hearing impairment.

Issues raised during the Inquiry are consistent with those presented by the Productivity Commission in its recent report, *National Satisfaction Survey of Clients of Disability Services*. The survey noted that of those who either needed communication equipment at home or at their place of employment, more than half had limited or no access to appropriate equipment.<sup>86</sup>

Comments were made during the Inquiry's consultations that new carriers and service providers have shown little interest in meeting the needs of people with disabilities, particularly in relation to provision of 'accessible' services.

*As new smaller entrants join the telecommunications industry, and these participants fail to provide accessible disability access, the range of telecommunications options available to people with disabilities is not expanding at the same rate as it is for other Australians. The benefits of choice and competition are therefore not flowing to people with disabilities.*

*The two larger carriers have made efforts to improve their access, but these initiatives are not mirrored by the new entrants to the industry.<sup>87</sup>*

The Disability Discrimination Act establishes threshold obligations for all businesses in Australia. The Inquiry believes that further obligations need not be set through telecommunications legislation as the Disability Discrimination Act already provides appropriate avenues for people with disabilities to pursue their concerns in relation to equipment provision. If a person with a disability feels that they are not receiving adequate service from their telecommunications provider, then there are processes of redress available through advocacy groups and HREOC.

The Inquiry was advised by a number of disability advocacy groups that individuals and organisations often lack the time and resources to pursue their rights under the Disability Discrimination Act. While acknowledging these difficulties, this is a matter for broader policy consideration regarding the operation of that legislation.

#### **FINDING**

**Inadequate resources are available to enable groups representing people with disabilities to participate in industry processes.**

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85 *Telstra Corporation Limited—Variation of Universal Service Plan Notice No. 1 of 2000*, 3 April 2000, p.2.

86 Productivity Commission, *National Satisfaction Survey of Clients of Disability Services*, Canberra, 2000, pp. 63–65.

87 Australian Communications Exchange, submission, p. 2.



## TRAINING AND PUBLIC AWARENESS

The Inquiry found that while users of TTY services were generally satisfied, there is a lack of training in setting up and using this equipment, coupled with low levels of public awareness regarding access. Similar considerations apply to other special purpose equipment.

*A small percentage have taken up the option of TTY usage. This number is growing as more people become aware of the availability of equipment, and of the option of voice carry over, but is not representative of the potential number for whom this is the most appropriate option. This is partly due to the fact that training in the use of the equipment and the National Relay Service is not generally provided—and there is no specific funding available for this purpose. What training there is, is provided in an ad hoc manner by retailers of TTYs, consumer groups within the sector and, to a limited extent, by the organisation responsible for the running the NRS. However, even that group is not specifically funded to provide training to individuals (or their family members). In some reported instances, equipment has been sent to people living in rural areas with no back-up for installation or training in its use—the packaged equipment has remained unopened/unused.<sup>88</sup>*

Customer interaction with service providers was identified as a problem in some cases.

*Not all points of service provision are fully accessible across all carriers. Most customer support officers are not conversant with appropriate communications strategies or the particular telecommunications access issues facing people with disabilities. They cannot, therefore, adequately deal with the needs of people who wish to use their service.<sup>89</sup>*

### FINDING

**Many people with disabilities lack the awareness or training to make use of equipment or services available to meet their needs.**

## LOW-INCOME EARNERS

The issue of affordability was raised in some carrier and consumer group submissions.

*Protective mechanisms for low-income or low-spend households are vanishing. Customers are held to ransom by the necessity of having the telephone available for emergencies, contact with doctors and support networks.<sup>90</sup>*

The Inquiry found that affordability for Australian consumers in relation to telephone charges continues to steadily improve as a result of increased price competition. The Australian Competition and Consumer Commission's Report, *Telecommunications Charges in Australia 1995–1999*, released in April 2000 found, in relation to charges for the standard telephone service, that:

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88 Better Hearing Australia, submission, p. 2.

89 ACE, submission, p. 2.

90 Consumers' Telecommunications Network, submission, p. 3.

- ▶ line rental charges for both Telstra and CWO had remained unchanged in nominal terms for residential services between 1995 and 1999;<sup>91</sup>
- ▶ local call prices had declined in real terms by 6 per cent (or up to 9 per cent after factoring in local call discounts);
- ▶ the national long distance weighted average prices for Telstra and CWO decreased in real terms by 14 per cent and 20 per cent respectively; and
- ▶ the international long distance weighted average prices for Telstra and CWO decreased in real terms by 61 per cent and 29 per cent respectively.<sup>92</sup>

The Inquiry identified a number of services available that can assist low-income customers, including Telstra's free InContact service and Homezip—a pre-paid card for the standard telephone service with a low monthly charge per customer. A number of service providers also offer a range of products including pensioner discount schemes (such as price reductions on local call fees and discounts on telephone connections), and pre-paid mobile phone and Internet contracts.

The Commonwealth Government also funds initiatives such as Telephone Allowance entitlements for eligible pensioners through the Department of Family and Community Services and the Department of Veterans' Affairs.

The Government's price control arrangements require Telstra to comply with a number of consumer safeguards, some of which are specifically designed to assist low-income customers.

An examination of international initiatives undertaken by service providers concluded that generally Australia compared well in relation to providing services for low-income customers. However, the Inquiry found low levels of awareness of these service options among customers.

## CONSUMERS REQUIRING PRIORITY REPAIR

Telstra has a number of commercial services that provide enhanced fault restoration services for individuals, and small and large businesses. However, these are currently only available in capital cities. Telstra has advised the Inquiry that it is exploring the possibility of extending the availability of such services to regional, rural and remote areas.

As part of its universal service plan, Telstra's Emergency and Essential Services Policy also incorporates a priority repair service for eligible customers or organisations. An application must be made to Telstra via a Customer Service Centre for access to the service. If successful, priority can be given to the management and restoration of faults reported at any time. Customers can request repairs be made outside business hours, however, this service attracts an after-hours charge. Customer service staff can also initiate after-hours repair and in some cases, fast-track repairs in emergency situations.

91 The Inquiry notes that Telstra re-balanced its access and local call charges during 1999–2000, resulting in modest increases in line rental charges and decreases in local call charges.

92 Australian Competition and Consumer Commission, *Telecommunications Charges in Australia 1995–1999*, Canberra, 2000, p. 4.

To determine the ease with which consumers might access information about Telstra's priority repair service, the Inquiry undertook some further research. The Inquiry found that Telstra's website did not include information on how to make an application for priority status, or the criteria used to determine eligibility. A follow-up call centre inquiry established that applications could be made by facsimile to the call centre, but that no information was available on the criteria that would be applied to such applications.

The Inquiry found that public awareness levels of the service appear very low. Scope exists for this service to be better promoted and for other universal providers in future to incorporate similar services. Furthermore, consultations indicated that Telstra had not always offered the option of priority repairs to customers who would seem to qualify for such services.

*Each time we called the service difficulties line (after a trip to the neighbour's) we were assured that work on it was scheduled for the next day. Even though I told Telstra that I am on call for our local Volunteer Rescue Squad, there was no action for days.<sup>93</sup>*

#### **FINDING**

**Inadequate levels of awareness exist regarding services available to meet the telecommunications needs of people requiring priority repair services or people on low incomes. Commercial priority repair services are not available in regional, rural or remote areas.**

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<sup>93</sup> Lyle Passfield, submission, p. 1.

## CHAPTER 6

# DATA AND MOBILE SERVICES



### SUMMARY

The majority of residential and small business customers in Australia are able to obtain access to the Internet via their standard telephone line at data speeds which are reasonable for the functions they are currently performing. However there is a significant number of customers, particularly in rural and remote Australia, for whom access to the Internet over their standard telephone lines is inadequate or not possible and who must therefore consider higher priced, high data speed options. These customers are disadvantaged by not being able to make a price/quality choice between dial-up access and high speed services.

Most large businesses, corporations and Government agencies wield sufficient purchasing power to ensure their telecommunications needs are properly met.

Over 95 per cent of Australians have access to terrestrial mobile phone services. Australian mobile prices have declined over the past three years and quality of service has improved significantly. Customer satisfaction with mobile services is very high (83 per cent for households and 75 per cent for small businesses). Satellite mobile services are available to all Australians but at a price higher than terrestrial services.

Increased competition in data and mobile services over the next few years should provide customers with improved price/choice options.

There appears to be a low level of awareness among customers and potential customers of the range of current and developing services. It is incumbent on the telecommunications industry to play its part in lifting customer awareness of products and services that could potentially meet their needs.

## INTERNET SERVICES

Australians are placing increasing importance on Internet access.

Internet issues were the third most significant raised in submissions to the Inquiry. The most critical was data transfer speed (48 per cent of all submissions which mentioned the Internet), followed by pricing/calling zones (19.5 per cent), availability of the service (12.5 per cent) and reliability (9.7 per cent for drop-outs and faults).

In order to access the Internet, users require both the services of an Internet Service Provider (ISP) and a communication service which connects their computer to that ISP.

The most common access is via a standard telephone line using an analogue modem which may achieve data speeds of up to 56 kbps. Alternatively, users can gain access via a hierarchy of higher speed services. Two of these—Integrated Services Digital Network (ISDN) services and various forms of digital subscriber line (DSL) services—use the existing telephone network. Other services—such as cable modem, terrestrial wireless services and satellite services—‘bypass’ the telephone system altogether. These can offer significantly higher speeds than those available through the normal telephone service.

### INTERNET AVAILABILITY—STANDARD TELEPHONE DIAL-UP ACCESS

Virtually all Australians with appropriate computing facilities access the Internet via their telephones. Customers generally require an analogue modem to convert data from a computer into an analogue signal that can travel along telephone lines. Telstra suggests that this will continue to be the main means of access, at least up to 2004.<sup>1</sup>

While almost all Australians can get some form of Internet access over their telephone line, the variable speed of that access was a recurrent theme during the Inquiry.

The Digital Data Inquiry noted that it is difficult to define a reasonable data speed as it depends on the expectations of the end user. This Inquiry has adopted the view that rather than pronouncing a particular speed as being reasonable, it is necessary to look at the key functions users want to undertake and the speeds required for these.

Households use the Internet mainly for communication, such as email and web browsing for educational, research and entertainment purposes. Business primarily uses the Internet for communications, research and e-commerce. The Digital Data Inquiry therefore focused on determining reasonable speeds for email delivery and web browsing.

The Digital Data Inquiry found that both email and web browsing are possible and effective at 14.4 kbps, although, obviously, considerably slower than at 28.8 kbps. However, browsing web pages with complex graphics would be quite difficult at 14.4 kbps but quite acceptable at 28.8 kbps.<sup>2</sup> It also suggested that 28.8 kbps may be more critical for business users and this is supported by the submission to the Inquiry from Australian Business Limited.<sup>3</sup>

It would appear that data speeds of between 14.4 kbps and 28.8 kbps provide a reasonable service for the current usage of most residential customers.

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1 Telstra, submission, p. 60.

2 Australian Communications Authority (ACA), *Digital Data Inquiry*, August 1998, p. 18.

3 Australian Business Limited, submission, p. 7.

The Inquiry detected a perception in rural and remote areas that urban consumers enjoy high data speeds of 56 kbps or more and therefore those living outside metropolitan areas are seriously disadvantaged. However, information provided by Telstra indicates that while data transmission over the customer access network (CAN) can approach 56 kbps in ideal conditions, average speeds below 28 kbps are common in all geographic areas. Telstra advised that the average speed for data transmission in cities is over 20 kbps.<sup>4</sup>

A recent report suggests data speed rates available to the vast majority of Americans are also around 28.8 kbps.<sup>5</sup>

## FACTORS INFLUENCING DATA SPEEDS

There are a number of network factors that influence the speed which can be obtained. These are:

- ▶ distance of the customer from their exchange;
- ▶ technology employed (copper wire, radio, wireless or satellite);
- ▶ quality of lines and interference encountered (noise levels, impedance matching);
- ▶ environmental factors (weather, profile of terrain, etc);
- ▶ customer equipment (modem type, computer setup, other equipment on the line); and
- ▶ carrier and ISP used by the customer (server capacity, compression techniques employed).

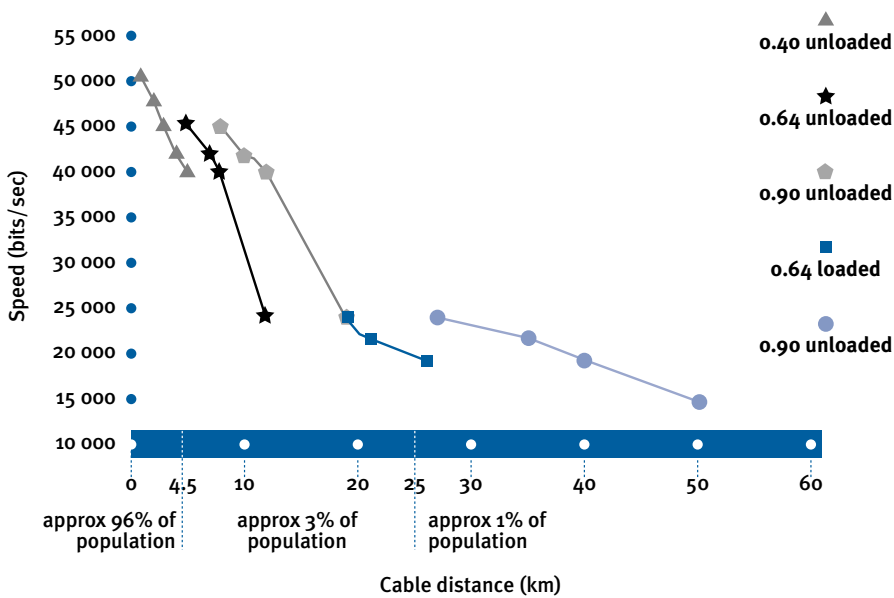
Figure 6.1 shows the maximum download speeds achievable over the telephone line at various distances from an exchange in ideal conditions.

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<sup>4</sup> Telstra, submission, p. 51.

<sup>5</sup> US Department of Agriculture, et al, *Advanced Telecommunications in Rural America*, April 2000, p. 24.

**FIGURE 6.1: MAXIMUM DOWNLOAD DATA SPEEDS OVER THE TELEPHONE LINE<sup>6</sup>**



Notes: Adapted from data supplied by Telstra.

These speeds do not take account of the effects of factors other than distance and therefore reflect the best possible, rather than normally experienced, speeds.

Customers will experience significantly different data speeds if their service is connected to the network by technologies other than copper pair lines, or if their telephone line incorporates electronic pair gain systems. Telstra has estimated that around ten per cent of Australia's approximately ten million phone lines use pair gain or other electronic systems on their copper line. A further small number (approximately 25 000 lines) in remote Australia receive their voice telephony services on radio systems or by satellite.<sup>7</sup>

Customers on radio technologies get slow and inconsistent data speeds. The Digital Radio Concentrator System (DRCS) delivers a maximum speed of 9.6 kbps, while the more advanced High Capacity Radio Concentrator systems (HCRC) allows a maximum speed of 14.4 kbps in ideal conditions.

Most customers with pair gain systems can obtain data speeds of up to 33 kbps. For a small number, around one per cent of the total network, their pair gain systems limit speeds to 4.8 kbps or less.<sup>8</sup>

6 Loading involves electrically altering the characteristics of the copper cable. This enables provision of voice telephony over much greater distances. Loading lowers the cable's performance at frequencies higher than the voice band making it unsuitable for ADSL and ISDN applications. The thickness of the copper wire used varies across the network, as shown on the table by the different sizes of copper (e.g. 0.40 mm, 0.64 mm).

7 Telstra, submission, p. 52.

8 Telstra, submission, p. 52.

Telstra provided the Inquiry with indicative estimates of the transmission rates experienced by customers in urban and provincial centres with populations over 2500 and rural and remote centres with populations less than 2500 (refer to Tables 6.1 and 6.2 below). Of the total 10.24 million customer lines, around 8.87 million, or approximately 87 per cent, are in urban and provincial areas and 1.37 million, or approximately 13 per cent are in rural and remote areas as at 30 June 2000.<sup>9</sup>

**TABLE 6.1: PSTN DATA TRANSMISSION RATES IN 'URBAN AND PROVINCIAL' CENTRES<sup>10</sup>**

Transmission Rate	2.4 kbps	9.6 kbps	14.4 kbps	28.8 kbps
Network Coverage	100%	99%	95%	75%

Note: The percentages are indicative only. For data rates of 9.6 kbps and above, the use of a V.90 modem is assumed. These percentages do not apply to facsimile transmissions, which have different data transmission characteristics.

**TABLE 6.2: PSTN DATA TRANSMISSION RATES IN RURAL AND REMOTE AREAS<sup>11</sup>**

Transmission Rate	2.4 kbps	9.6 kbps	14.4 kbps	28.8 kbps
Network Coverage	99%	90%	85%	60%

Note: The percentages are indicative only. For data rates of 9.6 kbps and above the use of a V.90 modem is assumed. These percentages do not apply to facsimile transmissions, which have different data transmission characteristics.

The Inquiry asked Telstra why the information provided represented a significant change from similar data provided to the Australian Communications Authority (ACA) in 1998 for its Digital Data Inquiry. Telstra advised their model has since been adjusted to incorporate use of a V90 modem, capable of speeds up to 56 kbps, rather than a V34 modem, capable of speeds only up to 28.8 kbps. V90 modems are now standard consumer equipment and the Inquiry considers this adjustment to be reasonable.

These tables indicate that most customers generally receive a data speed over their telephone of between 14.4 kbps and 28.8 kbps. The conclusion that reasonable data speeds are generally available over telephone lines appears supported by the ACA's findings of high levels of consumer satisfaction (over 70 per cent) with their Internet service generally, excluding costs.<sup>12</sup>

9 Telstra – Inquiry communication.

10 Telstra advises that V.90 modems work only when the Internet Service Providers have digital access to Telstra's network (such as ISDN) and the modem users must have PSTN connections with only one analogue/digital conversion in the path. In the case where there are additional analogue/digital conversions in the path, the modems revert to V.34 working. The speeds achieved by V.90 modems decrease with distance from the exchange and with other impairments such as noise and impedance matching. The use of electronics in the CAN introduces additional analogue/digital conversions and therefore the modems revert to V.34 working which achieve lower speeds.

11 Telstra advises that in the rural and remote areas, the long distance between customer lines and exchanges reduces the speeds of modems because of their high attenuation and susceptibility to noise. Also, the long distance frequently necessitates the use of electronics which introduce Analogue/Digital conversions to the signal path.

12 [www.aca.gov.au/publications/cons\\_satis\\_report2000.htm](http://www.aca.gov.au/publications/cons_satis_report2000.htm). The question asked by the ACA was about overall satisfaction with the Internet service received apart from the costs involved.



However, approximately five per cent of lines in urban and regional areas and 15 per cent of lines in rural and remote areas will not be capable of data speeds of 14.4 kbps or above. This represents 649 000 or approximately six per cent of all Telstra's lines.

For a small percentage of the Australian population, therefore, (and more concentrated in rural and remote areas), their ability to access the Internet using their standard telephone line for emails and web browsing activities is limited, or non-existent.

The Inquiry has identified two Government initiatives that have the potential to improve data speeds experienced by rural and remote Australians. The tender to provide untime local calls and universal services in Telstra's 'Extended Zones' invites bidders to offer service enhancements, such as improved data speeds, as part of their tender. The Department of Communications, Information Technology and the Arts advised the Inquiry that it expected seven carriers would be invited to tender for the provision of services under this program. The Inquiry has been told by a bidder that the use of satellite technology could deliver, amongst other things, data speeds of 28.8 kbps as part of a basic service with access to higher data speeds as an optional extra.<sup>13</sup>

The second initiative is to undertake Universal Service Obligation (USO) contestability pilots in two regional areas—central-west and south-west Victoria/south-east South Australia and north-east NSW and inland south-east Queensland. It will also enable new universal service providers to offer alternative services in order to attract a customer base. It is likely that those alternative services will seek to address unmet service needs, including enhanced data speeds.

#### **FINDINGS**

**Almost all Australians can access the Internet via their standard telephone lines.**

**Approximately six per cent of customers, more highly concentrated in rural and remote areas, experience data speeds which would appear inadequate for meeting common residential needs and must consider higher priced alternatives to get reasonable data speeds.**

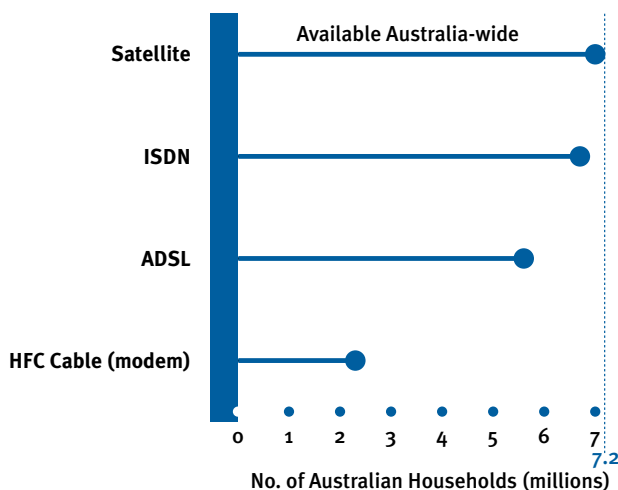
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13 Cable and Wireless Optus – Inquiry communication.

## INTERNET AVAILABILITY—HIGH SPEED ACCESS

Figure 6.2 below shows the different types of high speed services available and provides an estimate of the number of households either currently able to receive them or likely to be able to receive them in the short term.

**FIGURE 6.2: HIGH SPEED DATA SERVICES—AVAILABILITY**



**Notes:**

As at June 1999, there were 7.2 million households in Australia.

Satellite: up to 400 kbps download speed. Currently services are one way with terrestrial backchannel. Two way services are being introduced.

ISDN: basic rate provides two 64 kbps lines and one 16 kbps line.

ADSL: up to 1.5 Mbps download speed. Availability is based on Telstra's proposed roll out to 2002.

HFC: based on information from Telstra and Cable and Wireless Optus.

### ISDN

ISDN is a technology which enables digital transmission of data over a telephone by the installation of special equipment at both the customer and local exchange ends of the line.

ISDN services are usually only capable of being provided to customers within 4.5 kilometres of an exchange. At least 96 per cent of the Australian population can be supplied with an ISDN service in accordance with Telstra's obligations under the Digital Data Service Obligation (DDSO).

Those customers that cannot access an ISDN service have a legislated right to an asymmetric digital data service, which provides a one-way data speed to the customer comparable to a 64 kbps ISDN line.

Telstra advised the Inquiry that more than 98 per cent of its approximately 5000 telephone exchanges are ISDN capable. Around one million access lines are currently ISDN connections. Residential customers account for only a small proportion of demand.<sup>14</sup>

## XDSL

Digital subscriber line (DSL) technology is the generic name for a range of technologies that send data at high speeds over the copper wires of the standard telephone line. The main DSL standard currently being implemented is asymmetric digital subscriber line (ADSL).

Telstra announced the rollout of its ADSL services to all capital cities, Launceston, Toowoomba and Bunbury in August 2000 and by 2002, will reach seven million homes, or 90 per cent of the population within 3.5 kilometres of an ADSL exchange. However, as some electronic systems do not allow for ADSL conversion, Telstra's ADSL service will effectively be available to around 81 per cent of the total population.

As a comparison, British Telecom (BT) announced that it would be rolling out a service using ADSL technology, to half the homes and businesses in the UK by the middle of 2001, increasing to 70 per cent coverage by the end of 2001. BT has indicated that around 85 per cent of those who live within 3.5 kilometres of an appropriate exchange will be able to receive the ADSL service.<sup>15</sup>

CWO, through its wholly-owned subsidiary XYZed, has begun to offer DSL services and plans to extend services to more than 120 exchanges, providing coverage for more than 75 per cent of Australian business.

Primus and Pacific Internet are also rolling out retail ADSL services.

A number of other players including AAPT, One.Tel, Netcom and Request DSL have announced plans to roll out ADSL services in the near future.

## CABLE

Cable modem technology can transmit data at downstream rates of up to 30 Mbps and upstream rates of 768 kbps. While cable modems have greater downstream bandwidth capabilities, that bandwidth is shared among all users on a line, and services are therefore subject to congestion. Telstra and CWO have both rolled out hybrid fibre coaxial cable (HFC) networks, running past 2.5 million and 2.2 million homes respectively in major metropolitan areas. The fastest cable service which Telstra offers is the Business Deluxe/Freedom Deluxe services which provide a downstream speed of 512 kbps and an upstream speed of 128 kbps.

Neighbourhood Cable has completed rollout of its HFC network in Mildura, while Austar uses a cable network in Darwin to supply Pay TV and high speed Internet services.

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<sup>14</sup> *Exchange*, 1 September 2000, p. 5.

<sup>15</sup> British Telecom, *Information Sheet – BT Openworld – Where Can I Get It?*, 2000.

## SATELLITE

Telstra offers a high speed Internet service using one-way (asymmetric) satellite technology for data transfer to the customer and the terrestrial telephone network for the return path. It offers to all Australians data speeds of between 64 kbps and 1 Mbps.

CWO, Ihug and Austar each currently offer, or plan to soon launch, asymmetric satellite services. CWO is a designated Special Digital Data Service Provider in WA, and will offer services which guarantee download speeds of between 64 and 128 kbps. Ihug's Satnet service provides an Internet connection service with downlink speeds of 400 kbps.

The Inquiry heard some criticisms of one-way satellite delivery for customers needing to send large amounts of data—for example people engaging in e-commerce or using the Internet for distance education. This still remains a 'weak link' for services for customers with an unreliable terrestrial backchannel.

*[I]f that is being delivered by asymmetric satellite, the back-haul route is still through the CAN, and I believe they are going to get wonderful data down from the satellite but the back-haul route is not going to allow the system to work because we just don't have the basic physical infrastructure on the ground to be able to do it. So there are severe limits to what this is going to do.<sup>16</sup>*

*... when you are sending data out on a 2400 bps guaranteed phone line, if you send a 30-page Word document out it takes you half an hour to send it. That's just ridiculous when you can receive the same size document in about two seconds via the satellite.<sup>17</sup>*

It is clear that one-way satellite services may not meet the needs of some rural and remote customers.

A number of suppliers are developing two-way satellite services to address such concerns.

Heartland recently launched a two-way satellite service providing high speed data using the Gilat satellite network.<sup>18</sup>

From January 2001, CWO's Countrywide service will offer two-way satellite for a variety of services including high speed data. Telstra has indicated it also expects to launch a two-way high speed satellite service early in 2001.<sup>19</sup>

## TERRESTRIAL WIRELESS TECHNOLOGIES

Austar has recently begun offering an asymmetric high speed Internet service using its Multichannel Multipoint Distribution System (MMDS) network. It is extending that service to all areas in which it offers terrestrial wireless television. Austar also indicated it is developing a two-way high speed service over its wireless network to target the business market.<sup>20</sup>

AAPT is rolling out very high speed data services to capital cities and many regional centres using local multipoint distribution system (LMDS) technology. These services will also be of most interest to business users.

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16 Jeremy Watson, Northern Territory Government, Darwin roundtable meeting, 3 July 2000.

17 Eric Broad, Pastoralists and Graziers' Association of WA, Perth roundtable meeting, 7 June 2000.

18 The Age, *Satellites Bring Bush into IT Age*, 24 August 2000, p. 4.

19 Telstra – Inquiry communication.

20 Austar, submission, p. 1.

Telstra has advised the Inquiry it is participating in a trial of code division multiple access (CDMA) mobile technology to provide permanent fixed services and expects to commercially deploy the service next year. This technology has the potential to offer data speeds of up to 144 kbps.<sup>21</sup>

#### FINDINGS

All Australians have access to one or more premium high speed (download) Internet services as an option in addition to the basic service.

A range of alternative service delivery options are emerging for high speed data services, providing greater choice and competition.

## INTERNET AVAILABILITY—INTERNET SERVICE PROVIDERS (ISPS)

Computer Choice Magazine found a competitive market of around 700 ISPs.<sup>22</sup>

The Australian ISP List states that there are 950 ISPs across Australia with 585 in metropolitan areas and 416 in rural areas. Table 6.3 below provides a more detailed classification.<sup>23</sup>

**TABLE 6.3: LOCATION OF ISPS IN AUSTRALIA**

State	Metropolitan	Rural	Total
New South Wales	230	189	338
Victoria	250	109	291
Queensland	148	149	232
Western Australia	138	56	174
South Australia	95	39	119
Tasmania	36	20	43
Northern Territory	38	10	39
Australian Capital Territory	71	0	71
<b>TOTAL</b>	<b>585</b>	<b>416</b>	<b>950</b>

Note: The rows and columns do not add up because the same company can offer services in more than one State or Territory or in both rural and metropolitan areas. The definition of rural/metropolitan is not specified on the website. The list may include Internet consultants as well as service providers.

<sup>21</sup> Telstra – Inquiry communication.

<sup>22</sup> Computer Choice, *Can't Get No Satisfaction*, July/August 2000, p. 1.

<sup>23</sup> Kim Davies, *Australian ISP List*, [www.cynosure.com.au](http://www.cynosure.com.au), 2000.

However, Computer Choice found that while there might be a significant number of providers around Australia, the vast majority of the ISP market is controlled by seven major players—Eisa, Primus, One.Net, CWO, OzEmail, Telstra and TPG—and that some people in rural or remote areas have little choice among ISPs.<sup>24</sup>

#### FINDING

Generally Australians are well provided for in terms of choice of ISPs. There is sufficient competition among ISPs to ensure that customers can choose the ISP that best meets their needs.

## INTERNET PRICING—STANDARD TELEPHONE SERVICE CONNECTION

Pricing of Internet services was raised as a significant issue during the Inquiry's consultation processes.

*[S]eventy per cent of the people who don't live in those towns [with points of presence] are paying between \$2.40 and \$12.00 an hour to connect to their service provider, to connect to us. When you're looking at 4800 to 9600 baud [kbps], it might take you an hour to download your emails every day, let alone having a look at anything on the Internet. It's certainly not getting equitable access fees, we're not getting equitable cost of calls.<sup>25</sup>*

The Human Rights and Equal Opportunity Commission recently reported on its Inquiry into regional and remote education. It found that the high cost of linking outlying rural homes and schools to information technology is cementing the disadvantages faced by children in small towns, and suggests that cheap access is a key to adequately educating country children and to the survival of their towns. Rural users have greater costs due mainly to lack of access to untimed local calls.<sup>26</sup>

There are two key components to the cost of Internet access: call costs and ISP charges.

An issue in a number of rural and remote areas is the lack of choice of ISPs which can be accessed by a local call. Telstra offers Big Pond Rural Connect which provides Internet access from anywhere in rural Australia at a non-STD charge. However, the cost of the service is higher than other Big Pond Plans and higher than the cost incurred by people in metropolitan areas. For a small number of customers this is the only provider accessible other than by an STD call.<sup>27</sup>

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24 Computer Choice, *Can't Get No Satisfaction*, July/August 2000, p. 1.

25 Garry Hansford, GrowZone Online project, Roma roundtable meeting, 20 June 2000.

26 Human Rights and Equal Opportunity Commission, *National Inquiry into Rural and Remote Education*, May 2000, p. 53.

27 Telstra, submission, p. 53.

**TABLE 6.4: COMPARATIVE HOURLY CHARGES FOR INTERNET ACCESS**<sup>28</sup>

	Call charges Peak weekdays \$/hour	Call Charges Off peak weekdays \$/hour	ISP Charges \$	TOTAL COST PER HOUR \$
OzEmail – no local call access	10.78	2.97	1.60	12.38 (peak) 4.57 (off peak)
BigPond – no local call access	10.78	2.97	1.70	12.48 (peak) 4.67 (off peak)
Big Pond Rural Connect	n/a	n/a	4.62	4.62
Big Pond – with local call access	0.22/call	0.22/call	1.70	1.92

Table 6.4 illustrates the impact of call charges as part of the overall Internet cost for users without local call access. The impact is particularly significant if access is required during peak periods. Even in off-peak periods, or using Rural Connect, the cost per hour is more than double that of users with local call access.

Many users without local call access are further disadvantaged by generally slower data speeds, which can lengthen the time needed to download data.

Commercial developments are reducing the number of consumers disadvantaged by lack of local call access to the Internet. The ACA found that over the past year more customers gained local call access to the Internet, and that the overall cost of Internet access stabilised.<sup>29</sup>

Two Government initiatives appear likely to address the disadvantage of customers who remain without local call access. The Extended Zone tender will require the successful tenderer to provide customers in the Extended Zones with access to the Internet for the cost of a local call. An allocation of up to \$20.3 million under the \$36 million untimed local call access to the Internet social bonus initiative will provide such access for those people outside these zones.

<sup>28</sup> The following Internet access plans are used: OzEmail's OzE10 Plan (10 hours per month for \$15.95), Telstra's Big Pond Regular User Plan (10 hours per month for \$16.95) and Telstra's Rural Connect service (\$4.62 per hour) for ISP costs. Telstra STD call charges for a distance of up to 100kms are used. Call charges calculated on basis of single call for one hour.

<sup>29</sup> ACA, *Telecommunications Performance Report 1998–99*, p. 144.

## INTERNET PRICING—HIGH SPEED CONNECTION

The costs for high speed connections are higher than for standard telephone line connections, but the real value to the customer also increases with faster speeds, usually greater reliability and the possibility of ‘always on’ technology by-passing the phone lines altogether.

The Inquiry heard that Australia has very high ISDN charges compared with other countries.

*ISDN access in Australia is very expensive when compared with that in America and Europe. Typically, US prices are 20 to 25 per cent that of Telstra's current charges for ISDN access. We would argue that current ISDN costs bear no relationship to carrier costs, and constitute a significant economic hurdle, in that regional firms are discouraged from entering or participating in e-commerce and the global economy.<sup>30</sup>*

An international comparison of ISDN prices conducted for the Inquiry by the Communications Research Unit of the Department of Communications, Information Technology and the Arts suggests that Australia compares favourably in terms of average usage charges. Australian connection and rental charges are comparatively expensive.

Information available to the Inquiry also suggests that costs of high speed Internet access using other technologies are comparable to equivalent services overseas. Costs are, of course, higher than for normal dial-up access, reflecting the additional value to consumers of those services. Further competition and increased take-up are expected to place downward pressure on current prices.

For details of international comparisons for high speed services, refer to Appendix E.

Infrequent Internet users who lack reasonable access to the Internet over their telephone are disadvantaged by the additional costs necessary to gain access using high speed services. While there are a number of developments likely to improve the ‘dial-up’ access available to many of these customers, their current disadvantage is real.

## INTERNET PRICING—ISP SERVICE CHARGES

ISP charges did not rate as a significant issue during the Inquiry with the exception of the cost of the Telstra BigPond Rural Connect service for those without untimed local call access. Given that most areas of Australia are well served by ISPs, competition helps ensure prices are generally reasonable.

The ACA found that ISP charges do not vary greatly across the country. The ACA found that non-metropolitan users may be paying slightly more each month for access, mainly because proportionately fewer users have access paid for by their employers.<sup>31</sup>

Recent data shows that Australia was ranked fifth lowest out of 30 countries in terms of the average price for 20 hours of Internet access over the period 1995-2000. Only Canada, Finland, USA and Iceland had lower prices.<sup>32</sup>

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30 Bruce Manning, Southern Province Project Group, Albany roundtable meeting, 6 June 2000.

31 ACA, *Telecommunications Performance Report 1998–99*, p. 150.

32 National Office for the Information Economy, *The Current State of Play—July 2000*, August 2000, p. 24.



#### FINDINGS

While customers currently without local call access to an ISP face a disadvantage in accessing the Internet, the Government's initiatives regarding untimed local calls should ensure that call costs will no longer be a key factor in inhibiting access to the Internet.

Prices for access to high speed data services and Australian ISPs are internationally competitive.

Customers who lack reasonable access to the Internet over their standard telephone lines are disadvantaged by not being able to make a price/quality choice between dial-up access and high speed services.

## INTERNET QUALITY OF SERVICE

The ACA has found that consumers generally have low-cost access to the Internet and are satisfied with the service provided by their chosen ISP. The lowest level of satisfaction was with the provision of information on the technical aspects of installing and maintaining an Internet service. Sixty-five per cent of residential consumers and 69 per cent of business consumers were satisfied with this aspect of service.<sup>33</sup>

General satisfaction with Internet access is supported by data from the Telecommunications Industry Ombudsman (TIO) showing that Internet-related issues still represent a very small proportion of total complaints (seven per cent of all issues investigated in the March quarter of 2000). Internet billing accounted for almost half of the Internet related complaints. Internet access accounted for 28 per cent of the total and complaints about Internet contracts at 10.6 per cent are the third most common Internet related complaint lodged with the TIO.<sup>34</sup>

#### FINDING

ISPs are generally meeting the needs of Australians wanting to access the Internet.

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<sup>33</sup> ACA, [www.aca.gov.au/publications/cons\\_satis\\_report2000.htm](http://www.aca.gov.au/publications/cons_satis_report2000.htm).

<sup>34</sup> Telecommunications Industry Ombudsman, TIO Talks, 19, June 2000, p. 3.

## CORPORATE DATA SERVICES

Corporate data services represent a range of high speed services or leased lines which connect into the public telephone system. They are usually dedicated (unswitched) and allow higher bandwidth than conventional copper technologies. Generally they are used by large businesses, corporations and Government agencies.

Switched data services such as ISDN, and other newer technologies such as Frame Relay, Asynchronous Transfer Mode (ATM) and satellite services are widely available. Key industry segments which are likely to have a particularly high demand for bandwidth are retail, trade, property and business services, health and community services and education.

The few submissions to the Inquiry from large businesses and corporations generally came from those operating in rural and remote areas. They listed lack of bandwidth and pricing as key issues.

*[T]he mining industry is an increasingly technical and complex area with large amounts of data needing to be transmitted between and within sites and head offices. Increases in the quantity of data transmitted mean that bandwidth is a particular issue ... the trend in many mineral companies is to have all sites connected to an internal network, allowing information such as reports ... to be transmitted electronically. Lack of bandwidth means that this is not an option where facilities are poor and some companies have reported that they cannot adequately communicate electronically with all areas of operations. This means they have to use alternatives such as paper copies or attempt to use satellite, fibre optics or microwave transmission. These latter options are more expensive by several orders of magnitude than standard transmission as enjoyed in metropolitan areas.<sup>35</sup>*

The Queensland Government suggested that high bandwidth services will be increasingly important in education, health (for remote consultation and diagnostic purposes), service delivery (e.g. virtual call centres), teleworking and electronic commerce (product presentation using real time video interaction).<sup>36</sup>

### CORPORATE DATA SERVICES—AVAILABILITY

Access to suitable telecommunications services is an integral part of business operations. Ninety-five per cent of big business and 93 per cent of medium and small businesses are located in major population centres where they have access to a wide range of services and competitors.<sup>37</sup>

The National Bandwidth Inquiry found that with few exceptions there is considerable backbone network capacity available and recent technological developments, such as in optic fibre technology, appear to ensure considerable additional backbone capacity in the future. There is a significant surplus of spare or potential capacity currently in Australia that could be commissioned at relatively low cost.<sup>38</sup>

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35 WA Chamber of Minerals and Energy, submission, p. 2.

36 Hon. Terry Mackenroth, MP, submission, p. 12.

37 Communications Research Unit (CRU), Department of Communications, Information Technology and the Arts (DOCITA) – Inquiry communication.

38 Australian Information Economy Advisory Council (AIEAC), *National Bandwidth Inquiry*, Canberra 1999, p. 150.

A number of carriers are now launching very high bandwidth services to meet market needs. Telstra has an agreement with Cisco Systems to create a new inter-capital multimedia network capable of delivering gigabit Ethernet services to corporate customers. The new service will support a variety of options for a range of business sizes and will carry integrated voice, data and video traffic.<sup>39</sup>

However, the National Bandwidth Inquiry characterised most rural and remote bandwidth markets currently as virtual monopolies, where there is little incentive to meet customers needs in a timely, cost effective and appropriate way. In rural and remote Australia there are only two significant bandwidth providers—Telstra and CWO—and only Telstra has true national coverage. This market concentration may limit the amount of capacity that is actually supplied to the market through active or passive ‘rationing’ by its owners.<sup>40</sup>

Most large remote corporations have their telecommunications requirements met in specific agreements with a carrier. For example, mining companies are generally of sufficient size to pay for the rollout of telecommunications infrastructure to service their business needs and usually the community of employees’ residential needs.

*The success of Normandy’s projects can be attributed to:*

- *appropriate planning by experienced people;*
- *knowledge of the timelines appropriate;*
- *close project management; and*
- *valid business cases.*

*Normandy has even at its remotest Australian sites, the same access to modern communication technologies, excluding mobiles, as any office in any capital city.*<sup>41</sup>

Telstra advised the Inquiry that it is willing to provide ISDN services to businesses which are more than 4.5 kilometres from an exchange, if the company enters into an agreement to pay a contribution to the extension of the access network.<sup>42</sup> Other providers, such as CWO and Bincom Satellite Systems also offer tailored communications services for remote businesses.

Smaller firms, however, may not have the purchasing power to achieve such solutions. For these firms, greater competitive pressures are needed to encourage the industry to meet their needs.

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39 Telstra, media release, 23 June 2000.

40 AIEAC, *National Bandwidth Inquiry*, p. 151.

41 Normandy Tennant Creek P/L, submission, p. 2.

42 Telstra – Inquiry communication.

## CORPORATE DATA SERVICES—PRICING

International comparisons indicate that Australia is mid-range in terms of high-bandwidth pricing. Prices are likely to drop markedly with greater competition in the market place.

In August 1998, the OECD compared the costs of a basket of national leased line charges for around 30 OECD countries including Australia. It found that Australia's charges were lower than the OECD average for 64 kbps lines and 1.5–2.0 Mbps lines. Australia ranked in the middle of the field (13th) for these charges.<sup>43</sup>

In March 1999, the Productivity Commission undertook a benchmarking pricing study for a range of services used by large businesses. These included: ISDN, Frame relay, Leased lines for the Internet and Mobile data services. Overall, Australia rated in the middle of the six countries surveyed (Sweden, Finland, Japan, New Zealand and the UK).<sup>44</sup>

The National Bandwidth Inquiry found that existing leased line prices in Australia are competitive with some European prices, although there is great variation in European tariffing. US prices tend to be significantly lower than Telstra's. While the National Bandwidth Inquiry suggested prices should fall across the nation as competition evolves, the more limited development of competition in rural and remote areas may mean a widening of the gap between metropolitan and rural/remote area prices.

High speed data service pricing was raised by a number of government service delivery agencies which believe that applications such as education and health should be provided with appropriate bandwidth at subsidised prices. While the Inquiry acknowledges the public benefits of improving the telecommunications services available to the education and health sectors, it does not agree that the costs should be borne by the telecommunications sector.

Further, it appears that the government sector generally has significant aggregated purchasing power. The Inquiry has been made aware that the Commonwealth and most State and Territory governments are already implementing, or planning to implement, strategies to use their aggregated buying power to obtain cheaper services for their agencies. For example:

- ▶ the Government of WA has implemented a Statewide Telecommunications Enhancement Program (STEP) designed to improve telecommunications infrastructure, foster competition and thus improve the level of services in regional WA.<sup>45</sup>
- ▶ the Victorian Government entered into a five year contract with AAPT to build a whole-of-Government broadband infrastructure for an online network (VicOne) linking government schools, departments, hospitals, other public sector facilities and some residential and commercial customers throughout Victoria at a faster and cheaper rate than individual agencies could negotiate.
- ▶ the Queensland Government has introduced ConnectEd, the Virtual Schooling Service and the Queensland Telemedicine Network.

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43 OECD, reported in AIEAC, *National Bandwidth Inquiry*, p. 104.

44 Productivity Commission, *International Benchmarking of Australian Telecommunications Services*, March 1999, p. 148.

45 Government of Western Australia, submission, p. 8.

- ▶ the Commonwealth Office of Government Online (OGO) is currently investigating how demand aggregation among agencies which are large users of data services may be used to achieve cost savings. The Government Leveraged Data Networks Project (or GOLDEN) is intended to deliver substantial savings to the Commonwealth; promote new and innovative services, particularly in under-serviced markets; and provide incentives for increased competition, especially in regional Australia.

During the Inquiry's consultations, a number of people expressed concern about the tension between 'all-of-Government' or sector-wide purchasing strategies and regional initiatives aimed at improving the quality and affordability of telecommunications services within regions. Government agencies, such as health and education service providers, may be important to regional initiatives as 'anchor tenants', providing a reliable revenue stream as the foundation for a sustainable, ongoing business case. If they are prevented from doing so by Government strategies, this can render regional initiatives unviable.

## CORPORATE DATA SERVICES—QUALITY OF SERVICE

A small number of submissions to the Inquiry raised some quality of service issues, regarding corporate data services.

*[T]he telecommunications infrastructure has not kept pace with growing demand for high bandwidth services, meaning the transmission facilities are [often] unreliable.<sup>46</sup>*

However, most significant purchasers of telecommunications services will have tailored service agreements that establish performance standards and appropriate penalties for non-delivery. Issues such as those noted in the quote above appear to be a function of network reliability factors discussed in Chapter 5.

### FINDINGS

**Evidence to the Inquiry indicates that the data needs of some major organisations with a presence in regional and remote areas are not being fully met by the telecommunications industry. This appears to be a function of relatively limited competition in those markets.**

**Major purchasers of telecommunications services exercise greater power in telecommunications markets than other consumers and are therefore likely to be the earliest beneficiaries of competitive developments.**

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<sup>46</sup> WA Chamber of Minerals and Energy, submission, p. 2.

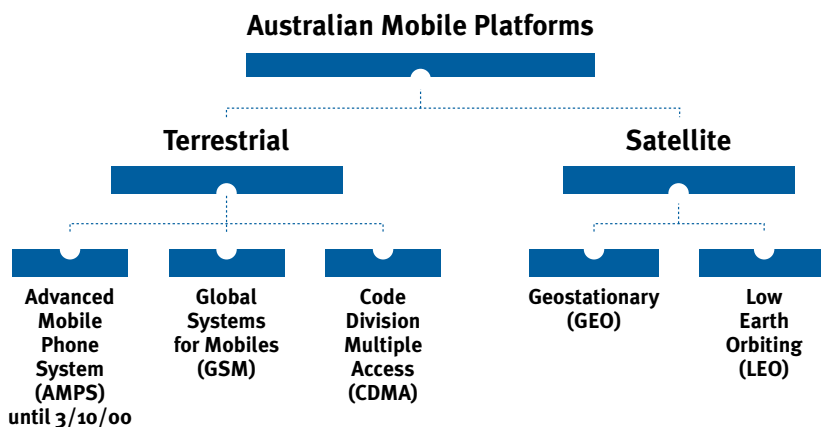
## MOBILE TELEPHONE SERVICES

There are now almost 8.5 million mobile phone services in Australia after 13 years of operation, compared with approximately 10.64 million fixed lines after over 100 years of operation.

Mobile phone issues comprised approximately one fifth of all issues raised in submissions to the Inquiry and focussed primarily on coverage. Coverage was also the prime mobile telephony issue discussed at the roundtable meetings. Price and quality of service issues were of relatively minor importance.

All Australians have access to at least one of the following mobile platforms:

**FIGURE 6.3: AUSTRALIAN MOBILE PLATFORMS**



However, there is considerable variation among the platforms in terms of the number of service providers and the extent of coverage provided.

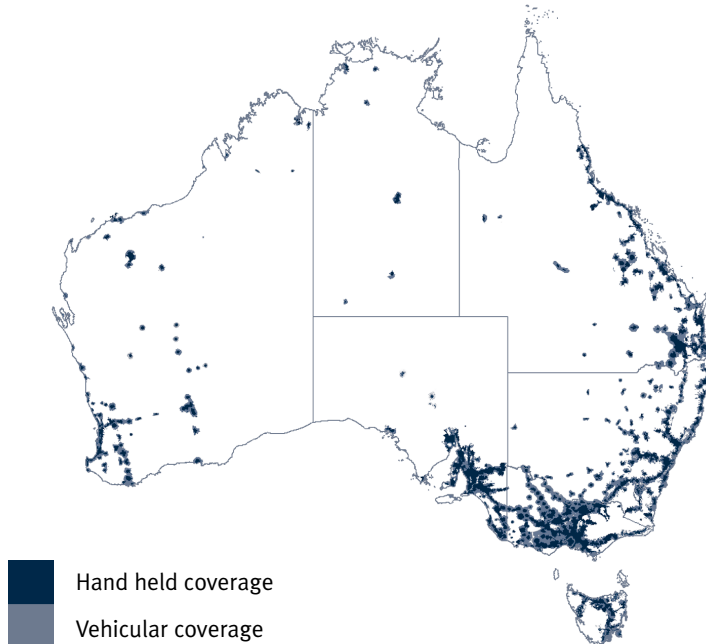
### MOBILE COVERAGE—ADVANCED MOBILE PHONE SYSTEM (AMPS)

In accordance with Government policy, the old Telstra AMPS network has been progressively closing down. The remainder of the network will close in October 2000. Under its licence conditions, Telstra is required to replace its AMPS network with a ‘reasonably equivalent’ digital service, and has been rolling out a CDMA network for this purpose.

## MOBILE COVERAGE—GSM

In 1992, the government awarded licences to Telstra, CWO and Vodafone to operate Global System for Mobiles (GSM) networks. Telstra's GSM network now covers 94 per cent of the population; CWO's network covers 93.1 per cent; and Vodafone's network covers 92 per cent.<sup>47</sup> The figures below are designed to give a general indication only of the coverage of each of the national GSM carriers.<sup>48</sup>

**FIGURE 6.4: TELSTRA GSM COVERAGE MAP**

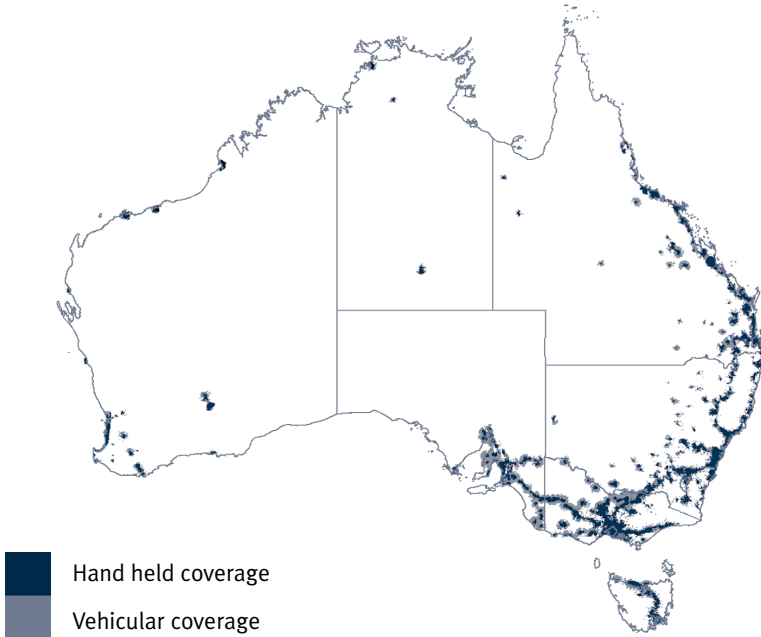


Source: Telstra, valid as at 30.6.00

<sup>47</sup> Telstra – Inquiry communication; Cable and Wireless Optus – Inquiry communication; Vodafone, submission, p. 16.

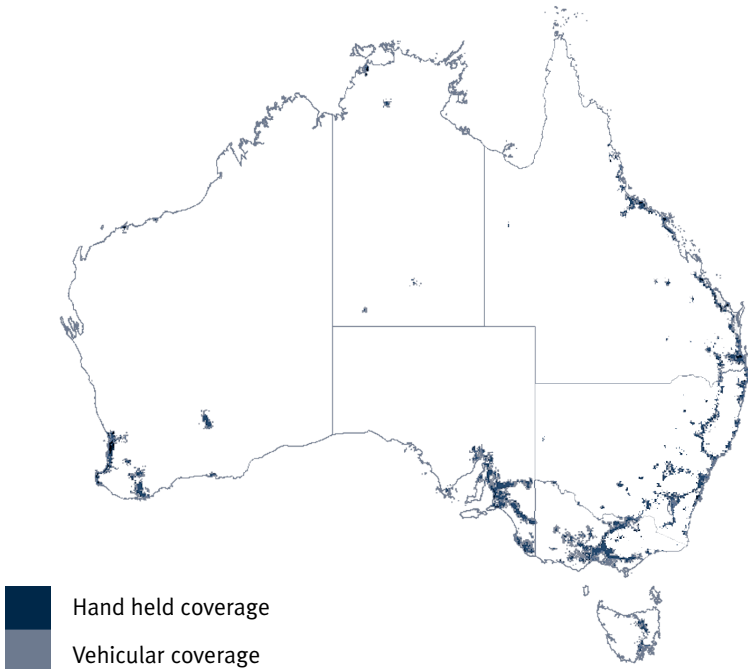
<sup>48</sup> There are places inside the marked coverage areas where a mobile phone may not work or reception will be reduced due to a variety of factors such as geography (e.g. mountains, tunnels and road cuttings) or location (e.g. basements, lifts and underground car parks).

**FIGURE 6.5: CWO GSM COVERAGE MAP**



Sources: CWO, valid as at 19.7.00.

**FIGURE 6.6: VODAFONE GSM COVERAGE MAP**



Source: Vodafone, valid as at 31.7.00.

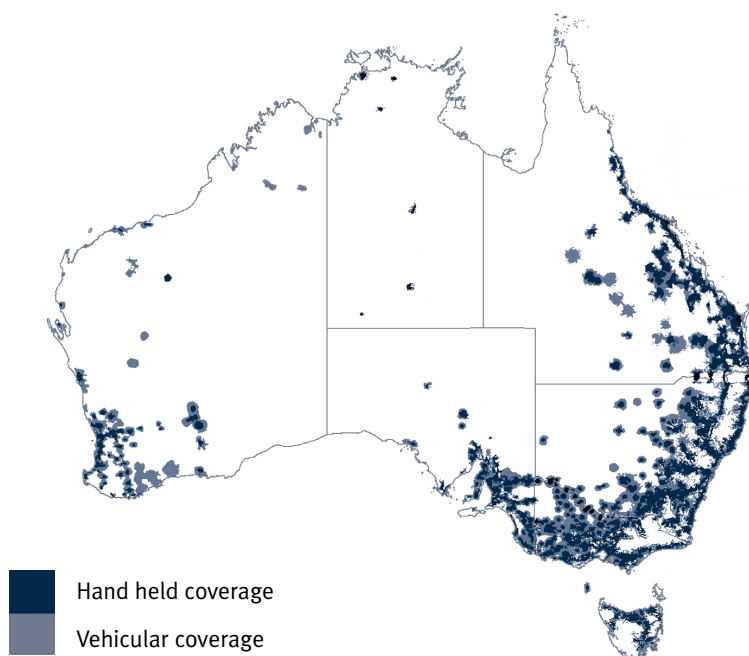


One.Tel has recently become the fourth GSM network provider and has a roaming agreement with Telstra to enable its customers to make and receive calls on the Telstra network while outside One.Tel's network area.<sup>49</sup>

## MOBILE COVERAGE—CDMA

Telstra's Code Division Multiple Access (CDMA) network now covers 96.9 per cent of the population via 2100 base stations.<sup>50</sup> The network extends over 960 000 square kilometres or 12.5 per cent of the Australian landmass, an area 79 per cent larger than the area previously covered by the AMPS network.<sup>51</sup> Half a million people not covered by the AMPS network have received coverage for the first time under the CDMA rollout. Figure 6.7 below provides a general indication only of Telstra's CDMA coverage area.<sup>52</sup>

**FIGURE 6.7: TELSTRA'S CDMA COVERAGE MAP**



Source: Telstra. Illustrates planned rollout to September 2000

49 One.Tel, 'Roaming with One.Tel's Next Generation Digital Network', [www.onetel.com.au/next\\_generation/roaming/roaming\\_nat.html](http://www.onetel.com.au/next_generation/roaming/roaming_nat.html).

50 Telstra – Inquiry communication

51 Telstra, media release, 30 June 2000.

52 There are places inside the marked coverage area where a mobile phone may not work or reception will be reduced due to a variety of factors such as geography (e.g. mountains, tunnels and road cuttings) or location (e.g. basements, lifts and underground car parks).

Hutchison launched its Melbourne and Sydney CDMA network in July 2000.<sup>53</sup> Hutchison also has a roaming agreement with Telstra. AAPT is due to launch a CDMA network in the first quarter of 2001 which will cover Queensland, Western Australia, South Australia, Tasmania, Darwin, Canberra, regional New South Wales and Victoria.<sup>54</sup>

## MOBILE COVERAGE—SATELLITE

Both Telstra and CWO offer satellite mobile phone coverage of the entire continent using geostationary earth orbit (GEO) systems. Consumer access is supplied via terminals that are significantly larger and more expensive than terrestrial network handsets. The Telstra and CWO satellite services have attracted only 1000 and 8500 users respectively.<sup>55</sup>

Vodafone has a Low Earth Orbit (LEO) mobile satellite service, supplied using Globalstar satellites. This system offers total landmass coverage from 52 satellites that orbit 500 kilometres above the earth's surface. The service is integrated with Vodafone's GSM network, so that calls are carried over the satellites only when the customer is outside Vodafone's terrestrial coverage area.<sup>56</sup>

## MOBILE COVERAGE—FUTURE DIRECTIONS IN NETWORK DEVELOPMENT

With the advent of the Hutchison, AAPT and One.Tel networks, the majority of the Australian population will soon have access to six terrestrial mobile systems. Terrestrial landmass coverage will nevertheless remain around 12.5 per cent of the continent. Satellite services constitute an alternative platform providing total landmass coverage, but take-up is currently very low by comparison to the terrestrial services.

Many submissions argued that continued rollout of terrestrial mobile services is important, particularly for further coverage along highways.

## COMMERCIAL DRIVERS FOR TERRESTRIAL EXPANSION

During consultations with the Inquiry, it was suggested that carriers currently ignore travelling business and tourist traffic, as well as the safety of people working away from fixed line services, when considering business cases for the further expansion of the mobile networks.

*If Telstra comes up with a business case for mobile telephony, which is a straight commercial reality, they are not necessarily dealing with the facts. The business cases for mobile telephony in the north-eastern goldfields, for instance, were not showing it viable to use some of the towns up there as sites for mobile telephony. When we spent a fair bit of time convincing them that the use of terminating phone calls, and all the travellers that come through the area, in a fly in, fly out-type operation, which a lot of the areas are, there was suddenly a business case that showed that it was a viable opportunity.<sup>57</sup>*

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53 Hutchison, submission, p. 7, 8; Hutchison, data request, p. 3–5; Hutchison, media release, 5 May 1999; Hutchison, media release 30 May 2000.

54 AAPT, submission, p. 8; AAPT, data request, p. 6; AAPT media release, February 2000.

55 Stewart Fist, *GEOs: The Workhorses of the Sky: Australian Communications*, July 1999, p. 71.

56 Vodafone, submission, p. 22–25.

57 Peter Currant, Goldfields-Esperance Communications Working Party, Kalgoorlie roundtable meeting, 6 June 2000.

The most significant barrier to further expansion appears to be the very large infrastructure investment required. Telstra has indicated that the total cost of the CDMA rollout which extended coverage to 12.5 per cent of the landmass, is \$600 million.<sup>58</sup> Telstra also advised that it would cost approximately \$230 million in capital expenditure to build an additional 600 base stations and repeaters in order to extend the network to an additional one per cent of the population.<sup>59</sup>

Telstra further advised that it takes into account a wide range of factors when considering terrestrial network expansion, including: capital and ongoing costs, local population, commercial and tourist visitor numbers, vehicle traffic, the nature of towns in terms of commercial and tourist significance, current and forecast penetration rates and market share, and historical and forecast customer usage data.

CWO and Vodafone have both identified commercial viability as the chief determining factor in any decision to expand existing infrastructure. CWO has indicated that likely return on shareholder investment will ultimately determine its rollout schedule. Vodafone has similarly noted that commercial factors must guide infrastructure development decisions.<sup>60</sup>

CWO has, however, cited investment criteria that include: road traffic volumes, population concentrations, location of business districts and commercial areas, handset penetration, forecast growth in customer base, customer feedback, marketing campaigns, planned infrastructure, competitor activity and channel support.

Vodafone has also cited competitive marketplace pressures and the need to supply extensive services to its customers.

The Inquiry was not presented with any evidence to suggest carriers have ignored commercial opportunities. Vodafone advised the Inquiry that approximately 30 per cent of its base stations are loss-making.<sup>61</sup> This suggests that carriers already have extended coverage into areas which, considered in isolation, are unprofitable.

The use of CDMA technology, such as wireless local loop, to provide fixed services as well as mobile services is an initiative that may increase the total revenue which could be gained in some areas and therefore have an impact on network development.

## FINANCIAL ASSISTANCE FOR TERRESTRIAL EXPANSION

Some funding has already been directed towards mobile phone coverage as part of the Networking the Nation and the Social Bonus programs.

From the \$250 million initially allocated to the Networking the Nation (NTN) program, 25 mobile phone infrastructure projects in regional, rural and remote Australia have been supported—at a cost of \$7.5 million. This is, however, unlikely to have a major impact on national coverage levels.

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58 Telstra, submission, p. 57.

59 Telstra – Inquiry communication.

60 Cable and Wireless Optus, data request, pp. 7, 8; Vodafone, data request, p. 28.

61 Vodafone – Inquiry communication.

The Government has allocated \$25 million from Social Bonus program funding for the provision of continuous mobile phone coverage along 9425 kilometres of designated Australian highways. A tender for the provision of this service should be allocated before the end of 2000. A further \$3 million has been set aside for mobile coverage in Western Australia, South Australia and Tasmania.

Money from the Social Bonus package is, however, primarily geared towards filling the gaps in the highways with the heaviest traffic flows. The tender process includes a 'beauty contest' component through which additional highways may also receive coverage. However, the funding level is such that the package is unlikely to make a significant impact on greater national highway coverage levels.<sup>62</sup>

## ROAMING

Some submissions suggested compulsory roaming would improve coverage levels. Roaming is a process that enables the customers of one mobile network to make and receive calls from areas that are covered by the mobile networks of other providers. Roaming can occur between GSM networks and also between CDMA networks but current handset limitations preclude GSM-CDMA roaming. It is also possible for roaming to be established between the Globalstar service and both GSM and CDMA networks.

Roaming is currently occurring between the national Telstra networks and the smaller networks of new market entrants One.Tel and Hutchison.

However, there are no roaming agreements between the three national GSM network operators. Vodafone is currently the only terrestrial network operator that has a roaming arrangement with Globalstar. It was suggested during consultations that compulsory roaming would have a beneficial impact on the outer extremities of the GSM networks in areas where there is currently only one network operator.

One view presented to the Inquiry was that mandatory roaming would maximise the network coverage available to the customers of each network.

*If I take my Telstra mobile phone (from Mt Isa) to (the) Century mine site I can't use it because they have chosen to go with Optus.*<sup>63</sup>

This view was rejected by at least one carrier.<sup>64</sup> An analysis of the coverage of the three major GSM carriers suggests that it is relatively rare for either CWO or Vodafone to cover a centre that is not also covered by Telstra. It is unlikely, therefore, that roaming would substantially extend the coverage possible from a service which is already available if customers chose the provider with the widest coverage. Further, the Telstra CDMA network provides even broader terrestrial coverage which would be unaffected by any roaming arrangement on the GSM networks.

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62 DOCITA, *Mobile phones on highways, extending service to highway users*, Request for Tender DOCITA 1522 August 2000.

63 Darcy Redman, Mt Isa–Townsville Economic Zone, Mt Isa roundtable meeting, 22 June 2000.

64 Paul Fletcher, Cable and Wireless Optus, Industry roundtable meeting, 12 July 2000.

A separate view presented to the Inquiry was that compulsory roaming would enable the introduction of competition into areas that can only support one network operator.

*It [roaming] is a necessity, we believe, because there are a number of towns ... that actually do have just one mobile phone service and for which it would be entirely unattractive economically for any other carrier to establish a base station.<sup>65</sup>*

Again, it is not clear what benefits would be achieved through roaming. The existing mobile carriers do not discriminate in their pricing between areas where they operate alone, and those where there is competition. In effect, all mobile consumers who use the service in areas with only one provider benefit from competition occurring elsewhere.

The view that mandatory roaming would have a beneficial effect on coverage levels on the extremities of the network must also be weighed up against the potential risks that this policy option would entail. The ACCC found that mandatory roaming would act as a disincentive for GSM infrastructure deployment because it would effectively negate competition and ultimately decided not to mandate it.<sup>66</sup>

However, the Inquiry found there was general agreement that roaming obligations should be established in areas where infrastructure had been provided with public assistance.

*[W]here the Government is specifically providing funding for the network rollout as through NTN, perhaps there it is quite appropriate for the Government to say there should be intercarrier roaming.<sup>67</sup>*

Roaming was also discussed more generally in terms of the Globalstar satellite service interacting with Telstra's CDMA network.

*So really to solve the mobile telephony needs of those most remote, we need a dual CDMA satellite handset and with the carriers having a roaming arrangement.<sup>68</sup>*

*Telstra is very interested in providing the best service we can for our customers and in that regard we would be very interested in talking roaming for our CDMA with Globalstar ...<sup>69</sup>*

*[I]t is for the industry to determine what sort of intercarrier roaming should take place, not for the Government to mandate it. We (Vodafone) have a product that provides 100 per cent coverage. We have taken the investment risk, the investment decision, to provide that service, and that's where we stand.<sup>70</sup>*

The negative impacts of mandatory GSM roaming would appear to outweigh the potential benefits, but there is a high level of support for roaming over publicly funded infrastructure.

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65 Phillip Skelton, WA Office of Information and Communications, Perth roundtable meeting, 7 June 2000.

66 ACCC, *Public Inquiry into Declaration of Domestic Intercarrier Roaming under Part XIC of the Trade Practices Act 1997*, March 1997.

67 Chris Dalton, Vodafone, Industry roundtable meeting, 12 July 2000.

68 Lindsay McDonald, Longreach roundtable meeting, 20 June 2000.

69 Paul Granville, Telstra, Industry roundtable meeting, 12 July 2000.

70 Chris Dalton, Vodafone, Industry roundtable meeting, 12 July 2000.

## MOBILES AND SAFETY

Many people value mobile phones as a means of enhancing personal safety.

Coverage in the more remote areas of Australia, where the majority of the safety issues were raised, would be a significant expense to the community, particularly if the primary use is only in emergency situations

Mobile telephony is only one of several methods that may be employed by people living, working and travelling in remote locations to ensure personal safety. High frequency (HF) radio offers a safety function with the base stations already located across the country and the customer equipment easily purchased, or rented, as required. Adherence to travelling safety protocols, such as those published by motorists organisations, is another important method by which people travelling in regional and remote Australia may ensure their own personal safety.<sup>71</sup>

There appears to be a general lack of awareness of other options for ensuring personal safety in remote locations, and there may be a greater role tourist organisations and relevant government bodies can take in promoting their potential value and availability.

## MOBILE COVERAGE—THE AMPS CLOSURE AND CDMA ROLLOUT

In accordance with government policy, 80 per cent of the AMPS network was closed down on 31 December 1999. Over the next six months, the ACA received a total of 600 calls to its Analogue Closure Hotline concerning CDMA-related issues, the majority of which were received in the months immediately following the AMPS closure.<sup>72</sup>

Concerns raised related to CDMA coverage levels, network performance and handsets, while common issues included a lack of CDMA coverage in areas previously covered by the AMPS network and perceived inadequate coverage in published CDMA fringe areas.<sup>73</sup> Network performance issues included call drop outs and post-dialling delays, as well as incorrect call diversions and the break up of speech. Handset issues included poor signals in published CDMA fringe areas and the poor performance of handsets in heavy vehicles.

The ACA has noted that many calls to the Analogue Closure Hotline appear to relate to equipment and handset issues that customers have interpreted as CDMA network coverage problems.<sup>74</sup>

Telstra advised the Inquiry that the quality of its CDMA network has improved over the course of the last nine months, and this conclusion is supported by the trend in consumer complaints to the ACA. The ACA has only received a total of 94 calls concerning CDMA matters from the start of July to 5 September 2000 despite the fact that a further 15 per cent of the AMPS network was closed down at the end of June.<sup>75</sup>

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71 For example, see NMRA website [www.nrma.com.au](http://www.nrma.com.au).

72 ACA – Inquiry communication.

73 Fringe areas represent the outskirts of AMPS coverage areas and were identified in the ACA's *Investigation of AMPS regional coverage under subsection 510(3) of the Telecommunications Act 1997*, June 1998.

74 ACA, media release no. 45–7, August 2000.

75 ACA – Inquiry communication.

The ACA has concluded that Telstra's 'CDMA and GSM digital service coverage is "reasonably equivalent", and in some cases better than the analogue service at June 1998'.<sup>76</sup> This conclusion is reflected in the views of the Australian Telecommunications User's Group (ATUG) and the National Farmer's Federation (NFF), which have both indicated that they consider that reasonably equivalent coverage has been successfully provided.<sup>77</sup>

#### FINDINGS

Over 95 per cent of Australians have access to a terrestrial mobile phone service, however coverage of the landmass is approximately 12.5 per cent. Satellite services provide total coverage of the Australian landmass.

While the further development of the mobile market and technologies may encourage additional terrestrial mobile rollout, commercial factors suggest significant changes in the level of total landmass coverage are unlikely. The cost of requiring an extension of coverage via regulation is not likely to be justifiable.

Regulatory intervention to require roaming may have a negative impact on further network investment and its benefits are unclear.

## MOBILE PRICING—RECENT TRENDS

The most significant concern expressed to the Inquiry regarding mobile phone prices related to the higher charges incurred by the users of the Globalstar service. Few submissions expressed concerns about the general pricing of mobile services.

As Tables 6.5 and 6.6 indicate, the price of mobile telephony in Australia has declined over the past three years. They also indicate the most significant reduction in prices has occurred over the past 12 months, particularly for consumers with low to medium usage patterns.<sup>78</sup>

**TABLE 6.5: ASSUMED MONTHLY CALLING PATTERNS<sup>79</sup>**

	Low	Medium	High
Calls	5	50	250
Minutes	8	80	400
% Peak	50	70	80
% Off Peak	50	30	20

<sup>76</sup> ACA, media release No. 45-7, August 2000.

<sup>77</sup> *The Australian* 'Telstra's Testing Time with CDMA's Second Coming', 23 May 2000, p. 53; National Farmers' Federation, media release, 8 August 2000; ATUG, 'Lessons Learnt in CDMA Phase One', ATUG Industry News ([www.atug.com.au](http://www.atug.com.au)).

<sup>78</sup> Analysis conducted for the Inquiry by the CRU, DOCITA.

<sup>79</sup> Prices per minute are inclusive of all costs when making a mobile call including access, call charges, handsets, connection and any applicable discounts. Twenty-seven post-paid plans and packages provided by Telstra, CWO and Vodafone were analysed. The analysis priced costs per month (inclusive of access, call charges, discounts and handsets) and divided this cost by the total number of minutes for each assumed calling pattern. The explicit cost of the handset per month was calculated by dividing the up-front cost of the handset connected to the plan by total contract length. Call charges were calculated assuming calls were allocated between peak, off peak, near and far distance calls both to other mobile services and to fixed line services. Discounts (in either dollars or minutes) were subtracted from the call charges before a monthly price was calculated.

**TABLE 6.6: AVERAGE PRICE PER MINUTE IN DOLLARS FOR ASSUMED CALLING PATTERN**

	1998	1999	2000	% Change
Low	4.43	3.41	2.28	-48%
Medium	1.02	1.02	0.81	-20%
High	0.56	0.55	0.47	-16%

Research by the Communications Research Unit showed that:

- ▶ For low users of mobile telephony, per month access charges have halved and up-front handset prices have declined while call prices have fluctuated.
- ▶ For medium users, up-front handset prices have declined, there is no clear trend in access prices, free minutes and free calls have increased and call prices have fluctuated.
- ▶ For high users, up-front handset prices have declined, free or discounted minutes have increased while access and call charges have remained fairly constant.

## MOBILE PRICING—INTERNATIONAL COMPARISONS

The Organisation for Economic Co-operation and Development (OECD) and the National Utility Services (NUS) have both completed international analyses of mobile prices this year.

The OECD and NUS studies adopted fundamentally different analysis methodologies, and subsequently reached quite different conclusions regarding the relative position of Australian mobile phone prices compared with the rest of the world.

The OECD comparison showed Australian prices to be around the average. It ranked Australia as the thirteenth least expensive country for a basket of services used by individuals, and the seventeenth least expensive country for a basket used by business out of the twenty-eight countries analysed.<sup>80</sup>

By contrast, the NUS analysis made no allowance for ‘baskets’ of services and compared prices simply on the basis of average per minute call charge rates. It compared the Australian average call rates with those of fourteen other countries and found that Australia was the fifth most expensive.<sup>81</sup>

Given the significant impact on total service price of subsidised handset costs and monthly rental charges (which often include free call minutes), an analysis based solely on call charges would not appear to accurately reflect the cost of mobile phone services to consumers.

80 OECD, *Cellular Mobile Pricing Structures and Trends*, May 2000.

81 NUS, *Mobile Phone Rates—How Does Australia Compare?*, 2000.



The price of the Vodafone-Globalstar mobile satellite service was a major issue in consultations, with differing views expressed regarding its affordability:

*[T]he cost of satellite phones is prohibitive. \$700 for a phone and \$2 a minute is quite expensive for your ordinary person off the street.*<sup>82</sup>

*I would have to characterise the price as almost affordable—not quite affordable.*<sup>83</sup>

*I think the cost of purchasing the phone unit itself is within the realms of feasibility*<sup>84</sup>.

Some people also noted that the price of the Globalstar service is relatively low in relation to prices of early terrestrial and satellite services.

*[T]hree years ago, a lot of people went into analogue phones here at a cost of not much less than \$1000. I know I bought one in October '97 for \$800.*<sup>85</sup>

*[I] think in all fairness that they are a heck of a lot cheaper than the first satellite phones we had some four or five years ago.*<sup>86</sup>

Inquiry research indicates that Australian Globalstar prices are low in relation to the price of the Globalstar product in other countries.

The Globalstar service is also relatively new, and prices should fall in the future given improved product awareness and increased take-up rates. Competitive pricing pressure may also result from the planned introduction of alternative satellite services over the next few years.

#### FINDINGS

**Australian mobile prices have declined over the past three years, with the most significant price reductions occurring in the past 12 months.**

**Australia's mobile phone prices were close to OECD averages prior to the most recent round of Australian price cuts.**

**The price of the Australian Globalstar service currently compares favourably with the price of the Globalstar product in other countries.**

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82 Stuart Holey, Northeast Wheatbelt Organisation of Councils, WA videoconference roundtable meeting, 7 June 2000.

83 Phillip Skelton, WA Office of Information and Communications, Perth roundtable meeting, 7 June.

84 Richard Colless, Inverell Shire Council, Moree roundtable meeting, 19 June 2000.

85 Jeff Cloughton, Albany Chamber of Commerce, Albany roundtable meeting, 6 June 2000.

86 Peter Cann, Fire and Emergency Services of WA, Port Hedland roundtable meeting, 8 June 2000.

**TABLE 6.7: GLOBALSTAR INTERNATIONAL PRICE COMPARISONS**

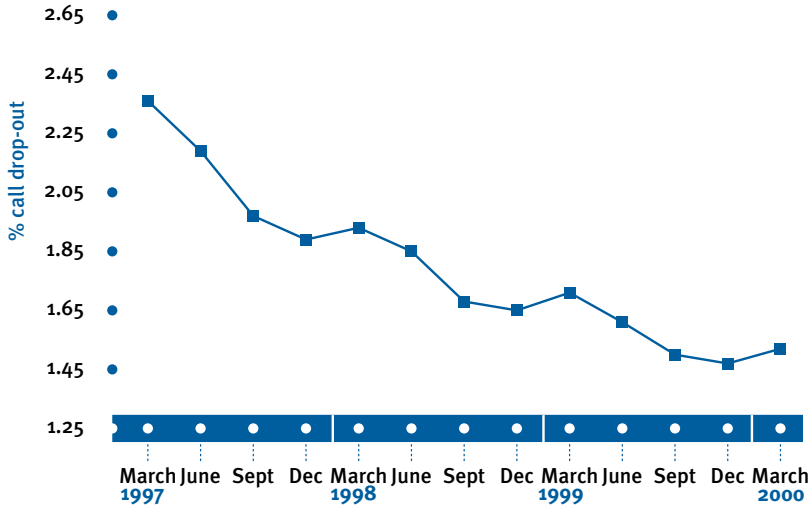
Country	Plan	Minutes include	Monthly access	Extra minutes
United States	Beyond Basic	0	\$30	\$1.69
	Beyond 50	50	\$100	\$1.59
	Beyond 100	100	\$170	\$1.49
	Beyond 250	250	\$370	\$1.39
	Corporate	0	\$20	\$1.49
Canada	Connector	0	\$21	\$1.71
	Extender 30	30	\$69	\$1.54
	Explorer 120	120	\$189	\$1.37
Brazil	Basic	0	\$18	\$1.83
	100	100	\$180	\$1.69
	300	300	\$480	\$1.55
Russia	Standard		\$40	
	Within gateway service area			\$1.19–\$1.59
	Between two neighbouring gateways			\$1.29–\$1.79
	Between Moscow and Khbarovsk gateways			\$1.49–\$1.99
Australia	Globalstar 75	25	\$46	\$1.10
	Globalstar 115	50	\$70	\$1.03
	Globalstar 175	90	\$107	\$0.99
Argentina	Mobile package	0	\$35	\$1.65
South Africa	Subscription	0	\$18.50	\$1.60
	Non-subscription	0	0	\$2.50

Note: Rates are for national calls only. All prices are in \$US.  
Source: Globalstar and Vodacom SA.

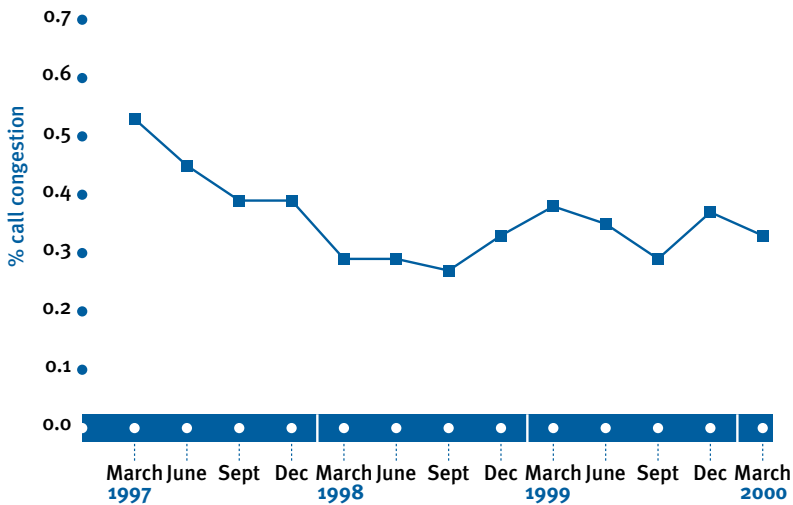
## MOBILE QUALITY OF SERVICE

Quality of service (QoS) concerns regarding mobiles featured in relatively few submissions and consultations. The ACA currently provides mobile QoS data on two key indicators for GSM networks: call drop-out rates and call congestion rates. Both have improved consistently over the past four years as Figures 6.8 and 6.9 demonstrate.<sup>87</sup>

**FIGURE 6.8: AVERAGE GSM CALL DROP-OUT RATES**



**FIGURE 6.9: AVERAGE GSM CALL CONGESTION RATES**



<sup>87</sup> ACA, *Telecommunications Performance Monitoring Bulletin*, Issues 1–12.

As Table 6.8 below shows, Australian QoS figures compare favourably with four major UK network operators.<sup>88</sup>

**TABLE 6.8: QUALITY OF SERVICE COMPARISONS**

	% of calls connected and completed successfully	% of failed set ups (= call congestion)	% of dropped calls (= call drop out)
BT Cellnet	94.6	2.5	2.9
One2One	96.4	0.9	2.8
Orange	97.3	1.3	1.5
Vodafone	95.3	2.7	2.0

The Australian figures also compare favourably with the French 1999 ‘Call Success’ figures of between 96 per cent and 98 per cent. The combined averages equate to an Australian ‘Call Success’ rate of 98.2 per cent.<sup>89</sup>

The ACA’s Consumer Satisfaction Survey revealed high levels of customer satisfaction with mobile services, with 83 per cent of all households and 75 per cent of all small businesses indicating satisfaction with the service they received. The small business satisfaction level was down from 80 per cent in 1999 and comparable with the 1998 figure. However the numbers of those ‘neither satisfied nor dissatisfied’ increased from 11 to 17 per cent while less than 10 per cent of either group was dissatisfied with the service received.<sup>90</sup>

The TIO complaint data indicates that mobile telephony complaints are very low in comparison with fixed line complaints. Mobile telephony has consistently been the subject of less than 10 per cent of total TIO complaints since 1996–1997 despite the fact that the ratio of mobiles to fixed lines is currently around 1:1.25.<sup>91</sup>

The TIO breakdown of mobile complaints revealed that GSM contracts and coverage maps are of prime concern: over 50 per cent of complaints related to misleading GSM contract advice and over 20 per cent related to coverage maps.

#### **FINDINGS**

**Quality of Service (QoS) has improved significantly over the past four years and current Australian QoS levels compare favourably with international data.**

**Consumer satisfaction with mobile services is very high, with over 80 per cent of households and businesses satisfied with the service they receive.**

88 OFTEL, <http://www.oftel.gov.uk/cmu/initiatives/mobilcpi.htm>.

89 ACA, *Telecommunications Performance Report 1998–1999*, p. 107.

90 ACA, [www.aca.gov.au/publications/cons\\_satis\\_report2000.htm](http://www.aca.gov.au/publications/cons_satis_report2000.htm). The Survey question explicitly excluded the cost of the mobile service.

91 Telecommunications Industry Ombudsman, submission, pp. 3–5, 10–12.

## MOBILE DATA

Improvements in mobile phone QoS may also be measured in terms of the increasing breadth of services. Mobile phones are no longer used exclusively for voice services and are increasingly being used to transmit data.

Short Messaging Services (SMS) have been available since the mid-1990s. SMS is a data protocol that enables text messages to be transmitted over GSM mobile handsets. Inter-handset messages have increased dramatically following an agreement by the major carriers to connect their SMS services in April 2000.

Mobile data over Wireless Application Protocol (WAP) has also been commercially available since late 1999. WAP is a protocol standard for mobile Internet access that enables mobile phones to access special web pages at a download rate of 9.6 kbps. WAP is superior to SMS in that it provides greater scope for interactivity.

Take-up rates for WAP are expected to increase following the completion of the rollout of General Packet Radio Service (GPRS) networks and the advent of commercially available GPRS handsets. GPRS overlays the GSM networks, and enables data to be sent in discrete packets at speeds of up to 115 kbps.

## CUSTOMER AWARENESS OF NEW SERVICES

An informed market is important for the effective operation of competitive markets. Consumers who do not know the service alternatives available to them, or who are not able to compare those alternatives, are less likely to make cost-effective choices. While the Inquiry has no clear research or evidence to confirm current levels of consumer awareness of product and price options, evidence from the consultation process suggests that these levels are low in some parts of the community.

This was also acknowledged at the Industry roundtable:

*[O]ne of the alarming things for me is that customers—our customers, collectively, around this room—do not know what is actually available.*

*I think it's clearly a dereliction of duty on our part that we are not communicating, especially with our customers.<sup>92</sup>*

While low awareness levels are not surprising given the rapid technological and market developments over the last few years, there is a need for improved provision of information on service options to consumers.

### FINDING

**While there are a number of significant developments taking place in provision of new services, the level of awareness among customers and potential customers is quite low. It is incumbent on the telecommunications industry to lift customer awareness of products and services available in the marketplace so that informed choices can be made.**

<sup>92</sup> Deena Shiff, Telstra, Industry roundtable meeting, 12 July 2000.

## CHAPTER 7

# MARKET DYNAMICS—COMPETITION, TECHNOLOGICAL CHANGE AND NEW MARKET MODELS



### SUMMARY

Structural change in the telecommunications industry and key regulatory developments will increase competition in the Australian market over the next five years. The large number of new network rollout plans, both for backbone and customer access networks, reflect this change.

New technologies will also continue to bring improvements in telecommunications products, by increasing data capability, providing access to voice and data services on the move, and tailoring services more closely to the needs of individual consumers.

Competition should grow particularly strongly in regional, rural and remote areas with the spread of cheaper and more scaleable delivery techniques, and increased and more differentiated demand. The introduction of contestability to the universal service arrangements will further promote development of competition in regional areas.

Continued Commonwealth Government financial assistance for more advanced services in regional, rural and remote areas will ensure the benefits of competition and technological change are felt throughout Australia. A more strategic approach to the allocation of this Commonwealth assistance should, however, be considered.

## COMPETITION

The steady growth of competition in the telecommunications sector is leading to continuing reductions in Telstra's share of a range of market segments. Licensed carriers increased from only four in June 1997 to 49 in September 2000.<sup>1</sup> There are also over 110 non-carrier telephone service providers currently operating in the market.<sup>2</sup>

The growth of competitive pressures varies significantly between regions and customer segments. Infrastructure competition in regional, rural and remote Australia remains in its infancy, and a number of new players have only recently launched their services. Most competitive activity by new market entrants focuses on the more commercially attractive, major markets.

The telecommunications sector is, however, dynamic, due to a number of key factors.

## DEMAND GROWTH AND DIFFERENTIATION

The rapid growth in demand for communications services, particularly data and mobile services, provides ever-increasing opportunities for potential suppliers to enter markets. In particular, demand growth raises the prospects that markets which were once capable of sustaining only one provider may become viable for multiple suppliers. Demand growth can also stimulate investment in new technologies and services which may previously have been uncommercial.

Increasing diversity of demand from residential, business and government customers offers opportunities for new competitors to target niche markets not met by incumbent suppliers. In fact, it is perhaps unreasonable to expect that any one national telecommunications provider could be capable of understanding and meeting the diverse telecommunications requirements of all Australians today.

## COMPETITION AND IMPACT OF KEY REGULATORY DEVELOPMENTS

Three years after the introduction of open competition in telecommunications, there is evidence that competitive entry and the benefits of competition are spreading—both geographically and across consumer market segments.

An increasing number of new carriers and service providers are focusing on niche markets, particularly services in regional areas. Together with the Australian Competition and Consumer Commission's (ACCC) decision to declare unconditioned local loop services under the access regime, the high rate of entry into regional markets has been a major factor in the rapid overall growth in numbers of new carrier licences issued.<sup>3</sup>

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1 At 12 September 2000.

2 Number of companies registered with the TIO at 30 August 2000.

3 Paul Best, *www.fairfax.com.au/communications/*, 1 August 2000, reporting comment by Frances Wood, Australian Communications Authority.

While regional providers are increasing in number, many are also entering into strategic relationships to increase their capacity to meet market needs. Such relationships can assist the smaller regional providers to compete with larger carriers by enabling them to offer a wider range of services.

Market entry may be attributed to the identification of previously untapped niche market opportunities. It is apparent, however, that commercial attention to regional markets is increasing with the level of competition in larger centres. Some longer-established carriers are increasing their focus on developing products and services for users in regional areas.

AAPT, Cable and Wireless Optus (CWO), Telstra and Vodafone are expected to tender for the right to be the universal service provider in the so-called Extended Zones.<sup>4</sup> AAPT established a regional and rural group in October 1999 and recently teamed with the Bendigo Community Telco Group to bring enhanced services to local businesses and residents.<sup>5</sup> Telstra's recent establishment of its business unit, Country Wide, is also indicative of a greater focus on the needs of regional consumers. Telstra told the Inquiry that:

*[T]he regional market is evolving rapidly and ... there is a clear place for community-based telcos in this market. The formation of Telstra Country Wide will bring closer focus to these developments. Telstra Country Wide is willing to explore all opportunities for working more closely with local communities to deliver enhanced service and price benefits to them. Franchising is just one of the options that could be considered.<sup>6</sup>*

In addition to, and in some ways facilitating, these commercial developments, has been the operation of the telecommunications-specific competition regulatory regime. Most notable, perhaps, has been the decision by the competition regulator, the ACCC, to require greater access to customer access networks.<sup>7</sup> At least ten providers have announced their intention to make use of new opportunities presented by this regulatory decision.<sup>8</sup>

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4 Each carrier registered interest in tendering.

5 AAPT, media releases, 11 October 1999 and 3 August 2000.

6 Telstra – Inquiry communication.

7 ACCC, media release, 22 July 1999.

8 CWO, AAPT, Primus, One.Tel, Netcomm, Request DSL, Broadband Access, Agile Communications, NEC and FlowCom have announced plans to offer ADSL services.



## UNBUNDLING THE LOCAL LOOP

The declaration of local telecommunications services in July 1999 is a particularly important development in regulation. The ACCC has stated that it should bring about much greater competition for local telephony services and high speed carriage services, as well as enhancing competition for long distance telephony services.<sup>9</sup>

Declaration of a service essentially means that companies supplying that service are, with limited exceptions, required to provide interconnection with, and access to, other companies requesting the service, on reasonable terms and conditions.

The ‘unconditioned local loop’ service declared by the ACCC enables competitors to use copper cable between Telstra’s exchange facilities and each customer. Competitors can connect their own electronic components and switching equipment to the cable in order to supply telephony and high speed services for carrying data, direct to end users. Declaration of this service provides new competitors with greater flexibility in developing and supplying new services to consumers.

The ACCC obtained an undertaking from Telstra in March 2000 not to launch its own Asymmetric Digital Subscriber Line (ADSL) offerings before providing an equivalent opportunity, through a wholesale ADSL service, for others to offer similar services.<sup>10</sup> Telstra’s retail and wholesale services were launched in August 2000.<sup>11</sup>

## THE IMPACT OF NEW TECHNOLOGIES

Recent technological developments also raise new market entry possibilities. Technological advancements:

- ▶ have reduced the costs of establishing alternative network infrastructure;
- ▶ provide a wider range of infrastructure possibilities, enabling competitors to more effectively target particular markets than existing providers, who may be reluctant to scrap or upgrade outmoded infrastructure;
- ▶ provide new entrants with opportunities to make use of wireless technologies which are more easily scaleable<sup>12</sup> lowering the initial costs of entry while retaining a capacity to expand with market growth; and
- ▶ are increasing the options for bypassing existing networks, thereby reducing the dependence of new entrants on access to existing infrastructure.

### FINDING

**Structural changes in telecommunications markets and key regulatory decisions are enabling and encouraging new market entry and the deployment of new technologies.**

9 ACCC, *ACCC Update*, Issue 5, November 1999, p. 3.

10 ACCC, media release, 22 March 2000.

11 Telstra, media release, 21 August 2000.

12 ‘Scaleable’ refers to an ability to tailor infrastructure investment to market demand.

## NEW MARKET MODELS

With the advent of open competition, Australia is witnessing the development of new market entry strategies. These 'new market models' include a wide range of strategies to improve communications resources and services, particularly in regional areas. They represent a change from the national, vertically integrated, full service provider strategy adopted by many of today's major competitors.

New market models include carriers or service providers which focus on limited geographical markets or market segments, such as suppliers of 'dark fibre', i.e. optical fibre not yet in service. They also include projects which are partly (or wholly) funded by governments to improve telecommunications services in a particular region by aggregating demand or changing the way that services are supplied.

Research undertaken for the Inquiry by Network Economics Consulting Group (NECG) provides case studies of commercial initiatives in regional areas, involving the construction of new backbone and customer access networks.<sup>13</sup> These include Neighbourhood Cable, SouthTel, Datafast Telecommunications, Soul Pattinson Telecommunications and TransACT. Among other recent initiatives are those of Heartland Communications, which launched its satellite services in August 2000<sup>14</sup> and Bincom Satellite Systems, which commenced pilot high speed voice and data services to rural and remote customers in Western Australia in June 2000.<sup>15</sup> Another is the planned rollout of high speed Internet services in regional Western Australia and the Northern Territory by Bush Telegraph, a Broome-based provider, using wireless local loop.<sup>16</sup>

NECG found that:

*The deregulated telecommunications environment has spawned numerous new industry participants. The private sector, government and community groups are pursuing the new delivery models. These models have emerged as a result of market opportunity, service gaps and strategic positioning...*

*The utilities providers, particularly power companies, are recognising the opportunity to provide broadband carriage infrastructure along and through their easements and rights of way. Other companies are providing new data and voice services, in some cases concurrently with the deployment of new backbone infrastructure. A number of rural communities are developing community-based models, some involving partial private sector ownership, while others contract in support services but retain community ownership.*

*The range of models reflect the range of circumstances and idiosyncrasies of regional Australia. They also bear out the inherent difficulty of providing comparable telecommunications services at comparable costs to regional communities.*

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<sup>13</sup> NECG, Regional Innovation and Australian Project Developments, *New Market Models for the Delivery of Telecommunications and Online Services in Regional Australia*, August 2000. The report may be downloaded from the Inquiry website ([www.telinqury.gov.au](http://www.telinqury.gov.au)).

<sup>14</sup> Heartland, media release, 23 August 2000, [www.vsat.com.au](http://www.vsat.com.au); *Exchange*, 25 August 2000, p. 3.

<sup>15</sup> BinCom newsletter, July 2000, [bincom.com.au](http://bincom.com.au).

<sup>16</sup> *The Australian*, 7 September 2000, p. 5.

*Notwithstanding the relative immaturity of the new models, there is evidence of increasing competition. This is particularly evident in the regional cities and larger towns where opportunity exists for the deployment of a variety of telecommunications technologies, particularly terrestrial and wireless based solutions.*<sup>17</sup>

A key conclusion of NECG's assessment of new market models is that those which are commercially driven will play an increasingly important role in the provision of modern telecommunications in regional Australia.<sup>18</sup> NECG considers the likely coverage of the new market models will be greatest in regional centres and associated hinterlands where demand is reasonably concentrated and growing. NECG concludes, however, that new models relying on terrestrial technologies could not be expected to address the needs of the remotest parts of Australia where demand levels are unlikely to sustain such technologies.<sup>19</sup>

NECG also found that the continued development of new market models will depend on government providing appropriate support and establishing an environment in which their growth is encouraged. In particular, they found that:

- ▶ regulation directed towards other objectives can limit the commercial attractiveness of market-oriented models. Price regulation was identified as one example where the commercial opportunities for profit are limited by regulation while leaving the underlying costs and risks of entry high;<sup>20</sup>
- ▶ 'champions' have played an important role in the development and introduction of many new models, suggesting that policies directed at building relevant knowledge in regional centres is important;<sup>21</sup> and
- ▶ high standards of governance of the new businesses is critical to managing the risk associated with such ventures.<sup>22</sup>

#### FINDING

**Competition is relatively immature in regional, rural and remote areas. The spread of new market models should improve services in many parts of Australia.**

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17 NECG, p. 14.

18 NECG, p. 6.

19 NECG, p. 14.

20 NECG, p. 43. This would be particularly true of more sparsely populated areas where the costs of supplying services are significantly higher than urban areas. As noted in Chapter 3, the Productivity Commission concluded in a recent report that the costs of supplying telephony services to areas of low population density are between six and ten times greater than the average cost across Australia.

21 NECG, p. 23.

22 NECG, p. 28.

## NETWORK ROLLOUT PLANS

The Inquiry is aware of further network rollout plans for fixed and mobile telecommunications services. Some information was supplied on a confidential basis and thus is not included in this report. Further, it should be recognised that announced plans are subject to a range of industry-specific and economy-wide influences and may therefore change.

A number of people submitted that the duplication of telecommunications networks represented a waste of national resources.<sup>23</sup> In particular, some suggested the investment in multiple networks in urban areas could be more effectively used to improve services in regional, rural or remote Australia.

The Inquiry does not agree with these propositions. Infrastructure competition, where it is economically efficient, allows competitors to provide innovative and improved service options that may not be possible on the incumbents' infrastructure. The Australian community benefits both from increased investment in new carriage capabilities and the pressures on all competitors to attract or retain customers.

The National Bandwidth Inquiry noted that an apparent lack of responsiveness in provisioning services in regional areas is a significant inhibitor to the availability of existing infrastructure capacity. The Inquiry concluded that inadequate competitive pressure by alternative infrastructure providers was the source of this problem.<sup>24</sup>

While this Inquiry acknowledges the frustration of rural and remote consumers in observing network duplication in urban areas, it is unlikely that any limitations on such activity would result in enhanced investment in rural and remote Australia. In an open market, such investment would more likely be redirected to other sectors or overseas.

There are circumstances where network duplication may be economically inefficient. The regulation of access by competitors to existing networks is intended to enable those competitors to make appropriate decisions regarding whether to 'build' or 'buy' communications capacity.

## BACKBONE NETWORKS

Backbone networks are now fully digital and employ a range of transmission technologies, including optical fibre cable, microwave radio and satellite.

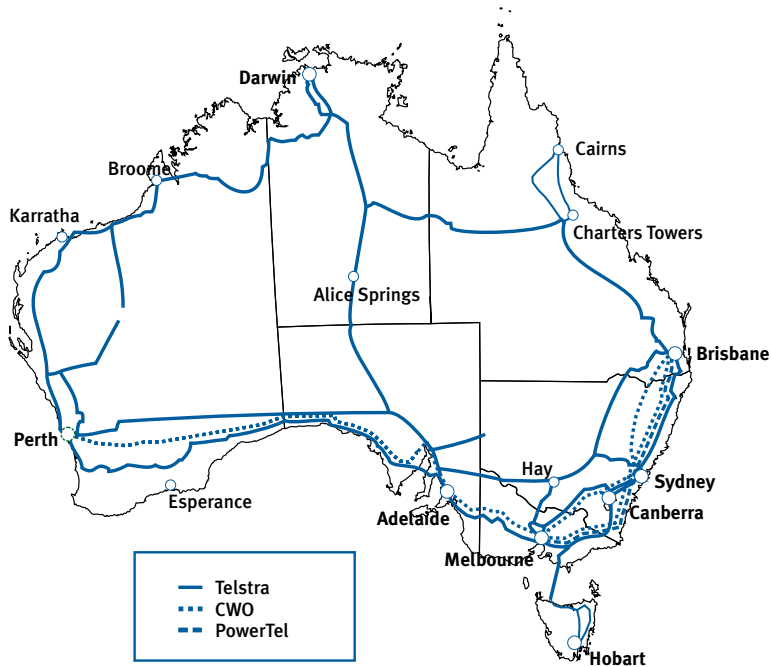
Plans have been announced to establish new backbone optical fibre and microwave networks, not only on the major inter-capital routes, but also on a number of 'thinner' regional routes. New backbone networks are important because they provide increased bandwidth and lead to competition among suppliers of bandwidth. Such competition would also lower the operating costs of regional service providers.

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<sup>23</sup> For example, Ian McLean, Communications Electrical Plumbing Union, Brisbane roundtable, 19 June 2000; and Jon Court, SA Farmers' Federation, Adelaide roundtable, 5 July 2000.

<sup>24</sup> Australian Information Economy Advisory Council (AIEAC), *National Bandwidth Inquiry: Report of the Australian Information Economy Advisory Council*, Canberra, 1999, pp. 14, 15.

**FIGURE 7.1: EXISTING OPTICAL FIBRE NETWORKS OF TELSTRA, CWO AND POWERTEL**



## OPTICAL FIBRE BACKBONE NETWORKS

Telstra, CWO and PowerTel have existing optical fibre networks. CWO, PowerTel, Nextgen Networks, Australian Fibre Networks, Amcom Telecommunications, SouthTel, AAPT and Southern Cross Cables are currently constructing, or have announced plans to roll out, new fibre networks. Existing and proposed networks are shown in Figures 7.1, 7.2 and 7.3.

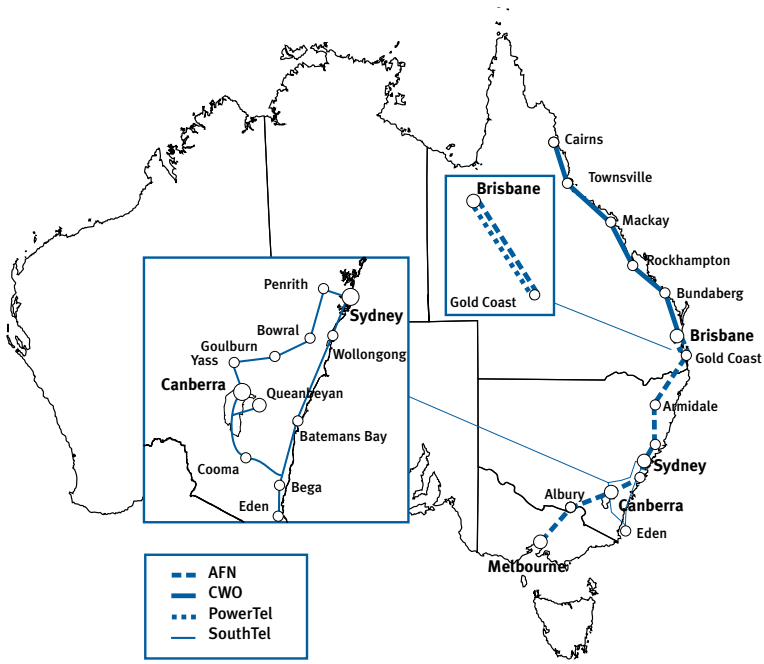
CWO and Reef Networks are constructing a link between Brisbane and Cairns, which is expected to be completed by April 2001.<sup>25</sup> This will extend the existing CWO Brisbane to Perth network by around 1800 kilometres and will follow the rail corridor, passing through Caloundra, Maroochydore, Maryborough, Bundaberg, Gladstone, Rockhampton, Mackay and Townsville.

PowerTel completed its Brisbane-Sydney link in October 1999 and its Sydney-Melbourne link in June 2000. A further link from Brisbane to the Gold Coast is expected to be completed by December 2000. PowerTel has also effectively extended its network recently by entering into strategic relationships with Soul Pattinson Telecommunications and UeComm.<sup>26</sup>

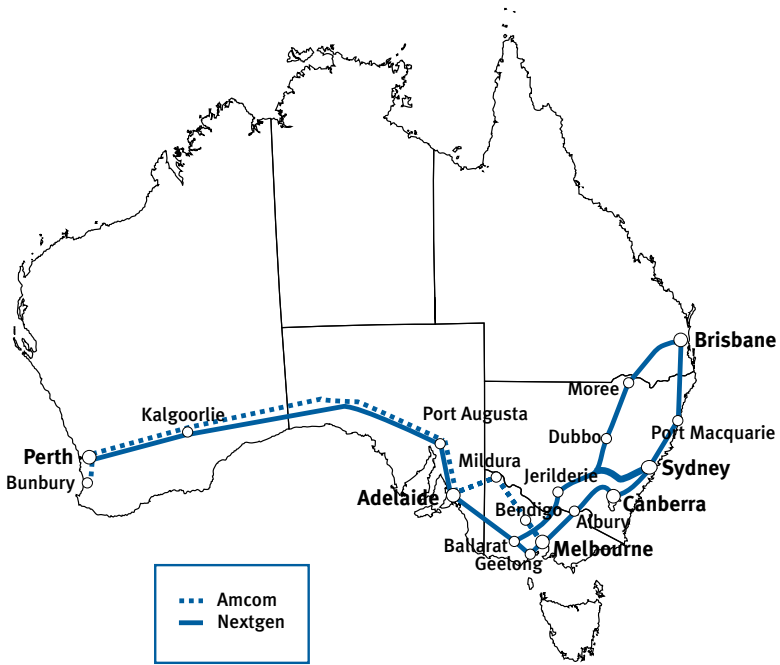
25 CWO, media release, 14 December 1999.

26 PowerTel, media releases, 7 October 1999, 11 May, 23 June and 28 June 2000.

**FIGURE 7.2: PROPOSED OPTICAL FIBRE NETWORKS OF AFN, CWO, POWERTEL AND SOUTHTEL**



**FIGURE 7.3: PROPOSED OPTICAL FIBRE NETWORKS OF AMCOM AND NEXTGEN**



Amcom Telecommunications (FiberTel) recently announced plans to commence rollout of fibre links from Melbourne to Perth. Links from Adelaide to Melbourne and Perth to Kalgoorlie will be constructed first, followed by Kalgoorlie to Adelaide and a spur from Perth to Bunbury. The network will pass through Bendigo, Mildura and Port Augusta, and Amcom plans to extend its network to cover up to 30 regional cities. Amcom also expects to lay some 300 kilometres of optical fibre cable in Perth, Adelaide, Darwin and Hobart by the end of 2000.<sup>27</sup>

Nextgen Networks also recently announced an investment of about \$850 million in a fibre network extending from Brisbane to Perth via Sydney, Canberra, Melbourne and Adelaide. The Sydney-Melbourne link is expected to be completed by June 2002, Sydney-Brisbane by September 2002 and Adelaide-Perth by early 2003. Nextgen Networks will offer bandwidth to other carriers, Internet service providers, and large corporate and Government users.<sup>28</sup>

Australian Fibre Networks (AFN) plans to invest \$200 million in the development of a fibre network linking Brisbane, Sydney, Canberra and Melbourne. The network, expected to be operational by mid 2001, may also pass through a number of major regional centres and interconnect with a number of current and planned international submarine cable systems.<sup>29</sup> AFN will offer bulk bandwidth to other carriers and service providers.<sup>30</sup>

SouthTel plans to build a fibre network linking Sydney with Wollongong, Nowra, Ulladulla, Batemans Bay, Bega, Cooma, Canberra, Goulburn and the Southern Highlands.<sup>31</sup> The network will connect government, educational, health and other customers in the first stage, then extend to commercial customers, and may use fibre connectivity in the local loop.

AAPT has an agreement with CWO to lease its optical fibre network from Brisbane to Perth and has also indicated plans to build fibre spurs from that network into about 50 regional centres over the next 2 years.<sup>32</sup>

Southern Cross has advised that its optical fibre submarine cable to North America is due to be completed in November 2000.<sup>33</sup> Most of the network has been designed with 40 Gbps capacity.

Nava Networks will build a \$US645 million 2.5 Tbps submarine system linking Singapore, Jakarta, Perth and Melbourne, to come into operation by July 2002.<sup>34</sup> This network is expected to triple Australia's available international capacity.<sup>35</sup>

These backbone networks are commonly supplemented in the capital cities and larger regional centres with fibre 'rings' connecting heavy users, particularly large business and Government, to the backbone network. Companies such as PowerTel and UeComm are entering into agreements giving them access to complementary networks, to provide end-to-end high bandwidth solutions.

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27 Amcom, media releases, 19 April, 1 June and 10 July 2000.

28 Nextgen Networks, media release, 9 August 2000.

29 *Exchange*, 31 March 2000, p. 2; NECG, pp. 66, 67.

30 NECG, pp. 66, 67; *Exchange*, 11 August 2000, p. 3.

31 NECG, p. 56.

32 AAPT, media release, 3 April 2000.

33 Southern Cross Cable Limited – Inquiry communication; *Exchange*, 11 August 2000, p. 12.

34 *Exchange*, Network News, 8 September 2000, p. 1.

35 Brett O'Riley, Nava Networks, reported in *Exchange*, Network News, 8 September 2000, p. 1.

## CAPACITY OF FIBRE NETWORKS

The information carrying capacity of optical fibre is increasing rapidly. In the mid 1980s one Telstra fibre strand between Sydney and Melbourne could carry either 0.14 Gbps or 0.565 Gbps. Today, the same fibres routinely carry 40 Gbps and could easily be upgraded to 80 Gbps.<sup>36</sup> This has been achieved by increasing the optical pulse rate in the fibre and, more importantly, by Dense Wave Division Multiplexing (DWDM) technology.

DWDM is essentially a technique for transmitting traffic over fibre in multiple channels by combining multiple waves of light into a single multiplexed signal for transmission along a fibre. In long distance links, the combined wavelengths are amplified at various points using optical amplifiers.

Currently available DWDM systems can increase the capacity of existing links more than a 100-fold and can usually be installed on existing underground fibre at much less cost than installing new fibre.<sup>37</sup>

Telstra recently commissioned Alcatel to build a 32-channel (80 Gbps) DWDM network on Telstra's Melbourne-Sydney fibre link.<sup>38</sup> CWO also announced it would roll out a DWDM network (by October 2000), which will increase capacity 40-fold.<sup>39</sup>

PowerTel's newly completed Brisbane-Melbourne network also incorporates DWDM technology, and enables scaling up to 80 Gbps capacity.<sup>40</sup>

DWDM technology is developing quickly and will continue to provide considerable scope for increasing capacity in existing fibre backbone networks. It significantly reduces the cost of providing additional bandwidth by making more efficient use of the fibre and network resources.

Alcatel announced a further development in optical fibre technology—its CrossLight photonic cross-connect system. Alcatel claims this system will reduce carrier and service provider network costs by 40 per cent.<sup>41</sup>

## MICROWAVE BACKBONE NETWORKS

Telstra, Macrocom and Soul Pattinson Telecommunications (SPT) have existing microwave networks. Macrocom, Datafast Telecommunications, Telecasters Communications, ntl Telecommunications and Agile Communications have all announced plans to roll out new microwave networks. Existing and proposed networks are shown in Figures 7.4, 7.5 and 7.6.

Macrocom currently has a microwave network linking Sydney, Canberra and Melbourne, and is expected to complete a link from Sydney to Brisbane by September 2000. It plans further links from Melbourne to Hobart by January 2001, Melbourne to Adelaide by March 2001, and

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36 AIEAC, *National Bandwidth Inquiry*, p. 63.

37 Ovum, *The Bandwidth Explosion*, August 1999, p. 133.

38 Alcatel, media release, 7 June 2000.

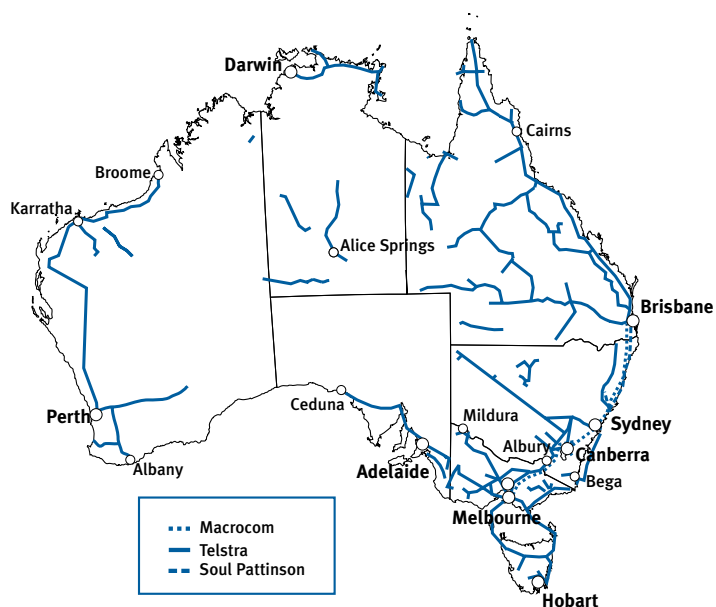
39 CWO, media release, 8 June 2000.

40 PowerTel, media release, 28 June 2000.

41 Adrian Lynch, *The Australian*, 19 August 2000, p. 6.



**FIGURE 7.4: EXISTING MICROWAVE NETWORKS OF MACROCOM, TELSTRA AND SOUL PATTINSON**



Brisbane to Rockhampton by September 2001.<sup>42</sup> Macrocom also plans to construct spurs from these trunk routes to over 55 regional centres.

ntl Telecommunications has plans for a (predominantly) microwave network from Cairns to Hobart, covering regional centres such as Toowoomba, Tamworth, Dubbo, Griffith, Albury-Wodonga and Mildura, and to install over 100 points of presence.<sup>43</sup> ntl Telecommunications is a joint venture between ntl Australia, WIN Television and Southern Cross Broadcasting. It plans to distribute broadcasting services and offer wholesale bandwidth to other carriers and Internet service providers. An initial investment of \$100 million is planned, with services expected to commence in June 2001.

SPT has a microwave network between Sydney and Brisbane and plans to extend the network south to Melbourne, providing bandwidth to the main regional communities on route. SPT intends to sell bandwidth to other carriers and service providers and to distribute programming for NBN Television.<sup>44</sup>

Another regional television broadcaster, Telecasters Communications, has plans to construct a broadband network from Brisbane to Cairns by April 2001.<sup>45</sup> The network will offer interconnection in Brisbane with a number of fibre and microwave links to the southern cities, and serve the major regional centres in Queensland. Telecasters will offer capacity to other telecommunications carriers and datacasters.

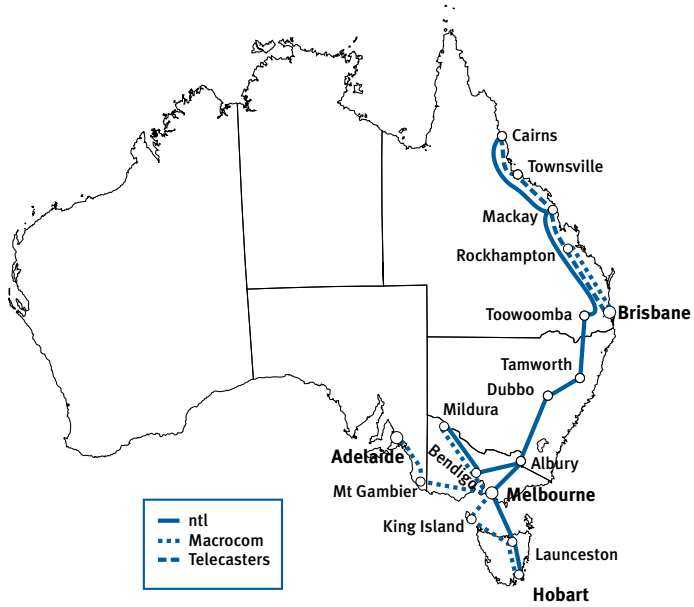
42 Macrocom, submission, p. 2.

43 ntl Telecommunications, media release, 7 August 2000.

44 NECG, pp. 76–78.

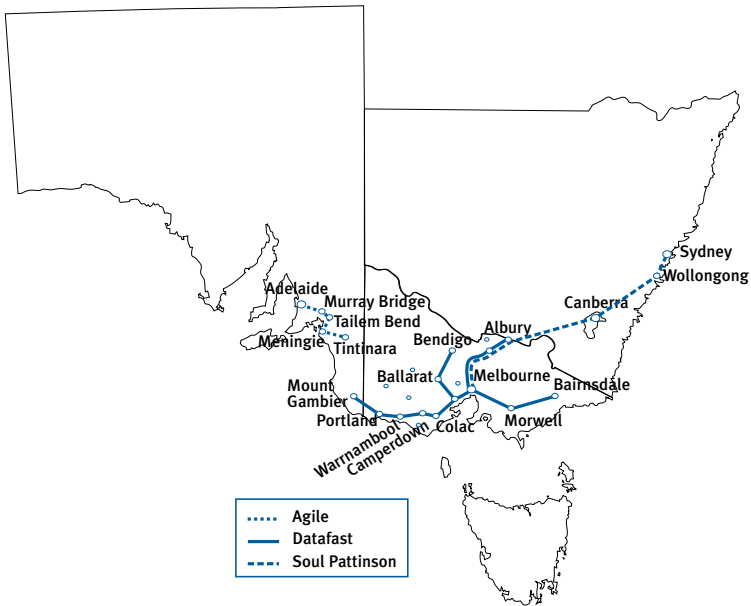
45 Telecasters, media release, March 2000.

**FIGURE 7.5: PROPOSED MICROWAVE NETWORKS OF NTL, MACROCOM AND TELECASTERS**



Note: Macrocom has an existing microwave network (see Figure 7.4).

**FIGURE 7.6: PROPOSED MICROWAVE NETWORKS OF AGILE, DATAFAST AND SOUL PATTINSON**



Note: Soul Pattinson has an existing microwave network between Sydney and Brisbane. Route of proposed Sydney-Melbourne link is indicative only.

Datafast Telecommunications is constructing a 34 Mbps microwave link to provide Internet, voice and virtual private network services between Melbourne and Mount Gambier, through Colac, Warrnambool, Portland, Mortlake and Hamilton, with spurs to Ballarat and Bendigo. Datafast also proposes to build links between Melbourne and Albury and Melbourne and Bairnsdale.<sup>46</sup>

Agile Communications also has plans to build a 34 Mbps microwave network linking Adelaide to all parts of the Coorong area (south-east of Adelaide), and most of the Murray Bridge area to provide data services and long distance voice services. Construction has commenced and service delivery is expected in early 2001.<sup>47</sup>

The installation of point to point microwave broadband networks is commonly less expensive per unit of capacity than installing a new optical fibre network or launching satellites, particularly if existing towers can be used to support the microwave equipment. However, the availability of spectrum does limit the capacity of these systems.

In remote areas where fibre or microwave capacity is unlikely to be deployed, satellite-based services, such as those being offered by Heartland Communications and Bincom Satellite Systems, present an alternative source of competitive pressure for backbone services.

#### FINDING

The level of competition in backbone networks is likely to increase greatly over the next few years.

## CUSTOMER ACCESS NETWORKS

There have been a number of customer access network initiatives which will ensure that the rapidly increasing supply of bandwidth on backbone networks can, in practice, be used. These initiatives include the rollout of ADSL technology and the deployment of new fixed networks, including optical fibre and hybrid fibre and coaxial cable (HFC) networks, wireless local loop systems and fixed satellite systems.

In addition to the customer access network initiatives already in place or under construction, there are a number of longer-term plans to roll out new networks.

## OPTICAL FIBRE OR HYBRID FIBRE-CABLE (HFC) NETWORKS

PowerTel, UeComm, AAPT, MCI Worldcom, Amcom and others are building optical fibre rings in inner metropolitan areas of the capital cities. PowerTel has deployed its fibre networks to over 150 points of presence in most capital cities and expects to more than double this number by the end of 2000.<sup>48</sup> UeComm owns and operates 700 kilometres of fibre links in Sydney, Melbourne, Brisbane and the Gold Coast and expects to install a further 1000 kilometres in 2001.<sup>49</sup> AAPT expects to connect 210 buildings to its fibre networks in the major capital cities by 2002.<sup>50</sup> Ipera is rolling out fibre links in Newcastle.<sup>51</sup>

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46 NECG, p. 72; [www.datafast.net.au](http://www.datafast.net.au).

47 NECG, pp. 59–61.

48 PowerTel, media release, 12 July 2000.

49 *Australian Financial Review*, 7 August 2000, p.24; Prospectus lodged with ASX on 8 August 2000.

50 AAPT, submission, section 4.2.

51 *Australian Financial Review*, 8 September 2000, p. 53.

TransACT is rolling out a \$30–\$40 million optical fibre network in Canberra using the existing poles, ducts and rights-of-way of ACTEW, the supplier of electricity services in Canberra. The last 300 metres to each customer will be copper cable. TransACT expects to commence services in March 2001 and complete rollout to most of Canberra by December 2002. TransACT will make available up to 52 Mbps of bandwidth downstream, with upstream capacity of 1.6 Mbps. TransACT will initially focus on providing wholesale access to the network by suppliers of standard telephone services, high-speed Internet, free-to-air TV, interactive and pay TV, and other broadband applications.<sup>52</sup>

Smart Radio Systems (SRS) plans to take optical fibre right to the home in Cooma, New South Wales, via trenching for natural gas by Agility (formerly AGL) and Great Southern Energy. SRS intends to offer 100 Mbps bandwidth and similar broadband services as TransACT.<sup>53</sup>

CWO is continuing to connect around 5000 customers a week to its HFC network, while Neighbourhood Cable is currently extending its HFC network from Mildura into Ballarat and will extend later into Bendigo and Albury-Wodonga.<sup>54</sup>

## WIRELESS LOCAL LOOP NETWORKS

Local multipoint distribution systems (LMDS) and multichannel multipoint distribution systems (MMDS) are two forms of wireless local loop. LMDS represents the newest type of broadband wireless network and is set up on the hub-and-spoke model with a base station antenna transmitting to and receiving from individual subscribers. LMDS operates in various frequency bands, from 24 GHz to 38 GHz. MMDS has historically been used to deliver one-way pay TV broadcasts, but is now seen as a way of providing two-way digital broadband access. It operates at a lower frequency than LMDS (1 GHz to 2.7 GHz) allowing much greater range.

AAPT plans to extend its LMDS services by rolling out 120 nodes across Australia from January 2001, providing coverage to over 20 of the largest regional centres, including Geelong, Ballarat, Wollongong, Newcastle, Gold Coast, Cairns, Mount Gambier, Kalgoorlie, Launceston and Alice Springs.<sup>55</sup>

If successful in acquiring LMDS spectrum, CWO will roll out broadband services to some 300 base stations within three years and target at least 25 regional centres across Australia.<sup>56</sup>

Austar has formed a strategic alliance with ADC Telecommunications to develop and deploy what Austar claims will be 'one of the largest MMDS systems to date in the world.' Two-way transmission facilities will provide high speed Internet and telephony services to more than sixty Australian towns and cities, commencing in early 2001 and targeting business and government users.<sup>57</sup>

Using 1800 MHz spectrum in Sydney, Melbourne, Brisbane, Adelaide and Perth, Hutchison Telecommunications also plans to build a national high speed wireless network over the next

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52 NECG, pp. 54, 56; [www.transact.com.au](http://www.transact.com.au).

53 Smart Radio Systems – Inquiry communication; *Exchange*, 2 June 2000, p. 5.

54 NECG, p. 76.

55 AAPT, submission, p. 10 of Attachment; AAPT – Inquiry communication. The commencement of AAPT's rollout of nodes to regional centres has been delayed some six months, until the first quarter of 2001. This may also delay completion of rollout, previously planned for end 2002.

56 CWO, submission, p. 9.

57 Austar United Communications, media release, 10 July 2000; submission, p. 1

two years. Hutchison will offer advanced data services to business and high-volume residential users in the first half of 2002.<sup>58</sup> Hutchison expects the network will initially deliver data speeds of up to 115 kbps but will be able to provide 384 kbps as more advanced technology becomes available.

Hutchison introduced its Orange One wireless local loop product in Sydney and Melbourne in July 2000 using CDMA technology—targeting the market for residential second and subsequent lines. Customers using their mobile phone at home are charged at untimed local call rates. AAPT intends to offer a similar product following the introduction of its CDMA service, now scheduled for February 2001.<sup>59</sup> AAPT holds licences for CDMA spectrum across Australia, except for Sydney and Melbourne, and is currently rolling out its network in all States and Territories.

Further spectrum for wireless local loop (WLL) networks at 3.4 GHz is being allocated by auction.<sup>60</sup> Nine applications have been received from companies intending to bid for this spectrum, which covers the capital cities and a large number of regional areas.

In addition, AMX Resources is planning to deploy WLL networks using its existing apparatus licences and/or spectrum it will seek to acquire from successful bidders in the 3.4 GHz auction. Deployment may be limited to regional areas if AMX is unable to gain access to spectrum.<sup>61</sup>

## FIXED SATELLITE

CWO plans to launch its C1 satellite in early 2002 to provide additional capacity over Australia and augment its current fleet of four satellites. The C1 satellite will enable all of CWO's existing satellite services, as well as an enhanced capacity to deliver direct-to-home TV, telephony, Internet and high bandwidth data communications in Australia and to Asia. It will also provide extra dedicated capacity for the Department of Defence. From January 2001, CWO's Countrywide service will offer two-way satellite for high speed data access.<sup>62</sup>

Heartland has also recently launched its two-way satellite services, initially offering Internet services, with plans to offer a range of services, including telephony, zero call cost Internet access, free-to-air TV, pay TV, email and distance education, in the coming months.<sup>63</sup>

### FINDING

**Rollout of new customer access networks using alternative technology, including wireless local loop, satellite and ADSL, will substantially increase competition in the local loop over the coming years.**

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58 Hutchison Telecommunications, submission, p. 8; *Exchange*, 25 August 2000, p. 6.

59 AAPT, submission, p. 6; Milestones 10; AAPT – Inquiry communication.

60 ACA, media release, 18 August 2000.

61 *Exchange*, Trade & Industry, 8 September 2000, p. 1.

62 CWO, submission, p. 18.

63 Heartland Communications, media release, 23 August 2000; *The Age*, 24 August 2000, p. 4.

## NEW TECHNOLOGIES

A factor which pervades almost any discussion of telecommunications is the rapid change in information processing and transmission technologies.

Developments in semiconductor, radiocommunications and optical fibre transmission technologies have been astounding. In computing it has been found that the density of semiconductor devices on microchips is doubling every 18 months (Moore's Law). According to one commentator, all indications are that this will continue until at least 2016, with known improvements in processes and materials.<sup>64</sup>

Interestingly, change in computing technology is actually slower than in wireless and optical fibre technologies. The number of customers who can be supported in a given radiocommunications spectrum is doubling every nine months, while for optical fibre, capacity on a given fibre is doubling every nine to twelve months.<sup>65</sup>

Professor Mark Sceats considers that the science of photonics—the study of particles of light and its application in optical fibre technology—is still in the 'dark ages', and that real photonic networks have not yet started.<sup>66</sup> Professor Sceats expects fibre will be laid ever-closer to customer premises and that eventually broadband services will be used for inter-personal communication.

Developments in satellite and terrestrial mobile telephone technologies are also driving significant changes in communications services.

## TOWARDS MOBILITY

There is a clear growth in the role of mobile communications devices among consumers. The development of so-called 'two and a half' and 'third' generation technologies will bring further changes.

Mobile phone technology is adding Internet functionality, and small palmtop computers are being developed to access the Internet while on the move. New types of personal communications devices are also being developed.

Existing second generation (2G) mobile networks were conceived about ten years ago, before the advent of the Internet, and primarily designed to extend fixed network services into the mobile environment at a maximum speed of 9600 bps. Since the introduction of 2G services, there has been a phenomenal growth in the volume of data being transacted across fixed networks, such that it now nearly exceeds the volume of voice traffic.<sup>67</sup> The Internet has been a major factor in this change.

New 'two and a half' generation technologies such as Wireless Application Protocol (WAP) and General Packet Radio Services (GPRS) have been designed to provide mobile users with access to the Internet and to increase the rate of data communications. GPRS effectively increases the signalling speed by allocating more of the available capacity for this purpose.

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64 Harry Bosco, Chief Technical Officer, Bell Laboratories, presentation to PCT Conference, Hawaii, January 2000.

65 Harry Bosco, Bell Laboratories, presentation to PCT Conference.

66 Professor Mark Sceats, CEO, Australian Photonics Co-operative Research Centre, address to general meeting of the Service Provider Industry Association, 5 July 2000.

67 AIEAC, *National Bandwidth Inquiry*, p. 10.

Third generation (3G) mobile technology adopts quite a different approach to the delivery of mobile services, using the latest digital technology in both the access and the core switching networks to enable greater capacity and data speeds. While GPRS can offer data speeds of up to 115 kbps, wideband CDMA, which is a 3G upgrade to the current CDMA and GSM networks, allows data rates from 384 kbps to 2 Mbps—at least 40 times faster than currently available.<sup>68</sup>

The global 3G market is estimated to grow from \$US1.5 billion in 2001 to \$US9.2 billion in 2005, with investment in infrastructure to support 3G services of \$US1 billion in 2001, increasing to over \$US5 billion in 2003.<sup>69</sup>

Because of their much greater data capabilities, 3G systems could significantly change the way people communicate, access information, and carry on business.

### 3G MOBILE SYSTEM IMPLEMENTATION

The International Telecommunications Union (ITU) recently determined the radiocommunications spectrum that may be used for 3G services. It includes spectrum in the 800 MHz and 2 GHz bands.<sup>70</sup> This means that all of the existing holders of spectrum for 2G services, i.e. Telstra, CWO, Vodafone, One.Tel, Hutchison and AAPT, will control spectrum that may be used for 3G services. The ACA has announced it proposes to auction 2 GHz spectrum in early 2001.<sup>71</sup> Spectrum will be allocated at a minimum for all State and Territory capital cities.

3G systems could be ready for trialing in the second half of 2001, however full commercial deployment is unlikely to occur before 2002.<sup>72</sup> The availability of handsets may be a constraint, given the complexity of 3G and current difficulties with availability of first generation wireless data handsets.

As coverage of 3G system cells is expected to be smaller than that of GSM1800 cells, more base stations will be required. It has also been suggested that the power limitations of handsets will limit the ability of users to achieve 384 kbps or faster data speeds, without additional base stations.<sup>73</sup> Consequently, the introduction of 3G services in rural areas of Australia is likely to be problematic, at least in the early stages of network rollout. 2G mobile data services such as GPRS may therefore be important in these areas for some time after commencement of 3G services.

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68 Brad Howarth, *Telecommunications*, 30 June 2000.

69 International Telecommunications Union (ITU), media release, 8 May 2000.

70 ITU, media release, 7 June 2000.

71 ACA, media release, 21 July 2000.

72 *Telecom Asia*, April 2000, p. 23.

73 *Telecom Asia*, April 2000, p. 25.

## NEXT GENERATION SATELLITE MOBILE SERVICES

Telstra and CWO offer satellite mobile coverage via geostationary earth orbiting satellites (GEOs), while Vodafone offers satellite mobile services via Globalstar's low earth orbiting (LEO) satellite system. Globalstar is one of three consortia established during the early 1990s to offer global mobile telecommunications services from low or medium orbit satellite systems. The other two—Iridium and ICO—became insolvent in August 1999. ICO did not launch any satellites.

Currently, plans for three new generation satellite mobile systems are well advanced – the Teledesic, New ICO and Skybridge initiatives. Each is likely to have Australia-wide coverage.

Teledesic is building a global, broadband 'Internet-in-the-Sky' network comprising about 290 geostationary satellites and plans to begin offering services in 2004.<sup>74</sup> Most users will have access at 64 Mbps on the downlink and up to 2 Mbps on the uplink. Teledesic considers its services will be more economical than optical fibre for access in areas of medium to low density and for users with low intensity of usage.<sup>75</sup>

New ICO is developing a medium earth orbiting global satellite system to provide communications services to both fixed and mobile users by 2003. It will offer 'a family of services that are the satellite equivalent of third generation wireless services, including wireless Internet and other packet-data services.'<sup>76</sup> The New ICO business plan appears to centre around providing a subsidiary delivery mechanism for the Teledesic system.<sup>77</sup>

Skybridge plans to launch a LEO system of 80 satellites to provide global broadband capacity, enabling telecommunications operators and service providers to offer high speed Internet access and online multimedia interactive services to business and residential users from 2002.<sup>78</sup> Skybridge also plans to provide a broadband delivery option for areas of low and medium population density and a reliable local loop solution for remote users.

Skybridge and Telstra have an in-principle agreement to give Telstra first option to become an equity partner and Skybridge's regional service provider for Australia, New Zealand and the South-East Asia region.

Satellite mobile systems, including the Thai-based iPSTAR system, may provide other broadband delivery options in Australia over the next five years.<sup>79</sup> It is claimed that the 'second-generation' iPSTAR system to be rolled out to Australia over the next few years will be able to deliver high-speed internet access at download speeds of up to 10 Mbps and upload speeds to 4 Mbps.

The potential for broadband, two-way satellite systems will become clearer over the next few years. While the commercial risks arising from high fixed start-up costs and long lead times for deployment are high, some observers consider these satellite systems, in particular, will benefit from escalating global demand for data services.<sup>80</sup>

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74 [www.teledesic.com](http://www.teledesic.com).

75 [www.teledesic.com](http://www.teledesic.com).

76 [www.teledesic.com](http://www.teledesic.com).

77 Charles Dodgson, *tele.com*, August 2000.

78 [www.skybridgesatellite.com](http://www.skybridgesatellite.com).

79 *Exchange*, 23 June 2000, p. 9.

80 For example, Joseph Anselmo, *Can Broadband Industry Fix Space Industry Woes?*, *Aviation Week and Space Technology*, 8 November 1999.



## TOWARDS CONVERGENCE

Broadcasting, Internet and telecommunications services are converging. Different content services, including voice telephony, radio and television services, are capable of being delivered by a range of different carriage networks and providers.

The recent Commonwealth Government review of convergence noted the pervasiveness of convergence across a range of industries and importance of digitalisation in spawning different models for service provision.

*Structural convergence affects all of the knowledge and transaction-intensive services industries, including telecommunications, finance, broadcasting, education, health, and retail. Convergence began decades ago in some industries, but has barely begun in others. It is eroding traditional economies of scale and scope, leading to a corresponding shift in industry structure and business strategy.*

*The inflexibility of analogue technology and physical infrastructure makes it difficult to supply customised services. Traditional service industries are dominated by the supply side with standardised services aimed at mass markets. Regulation in traditional industries is industry specific, closely matching this model. In contrast, digital technology permits multiple service offerings to be provided over the same network. This allows third party service providers and customers greater control over service delivery, shifting control of the services market away from traditional infrastructure owners.*

*A different structural model for service provision on digital networks is emerging with business activity at three main levels: applications, connectivity and infrastructure.<sup>81</sup>*

The emergence of Voice over Internet Protocol (VoIP) services is an example of convergence. VoIP is a technology where telephone calls are carried over the Internet. While VoIP is not permitted in a number of countries, its use is growing rapidly in others. Estimates are that the number of global call minutes routed over the Internet will increase from 1.7 billion in 1999 to 6.3 billion in 2000,<sup>82</sup> and that telephony will account for 20 per cent of all Internet traffic by 2005.<sup>83</sup>

As VoIP uses packet switching technology, rather than circuit switching as with traditional voice calls, it is commonly charged on a fixed monthly fee basis, with unlimited calls. This makes it attractive to heavy users of long distance call services, particularly international calls, though voice quality remains lower than on the fixed telephone network.

VoIP suppliers are commonly moving to develop packet switched backbone networks which will see data and voice merge. Ovum considers that the current price advantage for VoIP will dissipate with rebalancing of distance-related tariffs in traditional long distance calling and possible collapse of the international regime of accounting rates.<sup>84</sup>

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81 *Convergence report*, pp. 3, 4, [www.noie.gov.au](http://www.noie.gov.au).

82 Wylie Wong, *Telecom giants tap the Net for cheaper calls*, <http://news.cnet.com>, 4 July 2000.

83 Paul Budde, reported in *Australian Financial Review*, 2 September 2000, p. 23.

84 Ovum, *The Bandwidth Explosion*, August 1999, p. 131 and p. 172.

Ovum sees the real long-term impact of VoIP technology being in innovative IP applications combining voice and data over a common IP infrastructure.

VoIP is permitted in Australia and has been offered by Internet service providers, including OzEmail. OzEmail ceased offering the service because it considered margins were not high enough.<sup>85</sup> NorthVoice, a US-based global provider, intends to offer a flat per minute rate and plans to establish five points of presence in Australia by October 2000. NorthVoice claims it is deploying a VoIP network covering 81 cities on three continents, to be extended to an additional 240 cities on five continents and enabling services to Canada, the USA, Hong Kong, South Korea, Singapore, Australia and Malaysia.<sup>86</sup> Global Dial has operated VoIP services in Perth since September 1999 and now offers services in Sydney and Melbourne,<sup>87</sup> while Datafast Telecommunications has provided VoIP services in regional Victoria since March 2000.<sup>88</sup>

CWO joined global Internet telephony carrier, ITXC Corp, in a venture to supply VoIP services.<sup>89</sup> CWO's long-term strategy is to continue to deploy an international IP network to provide lower cost transport for international voice and data services. CWO plans to offer VoIP services to business and Government users by the end of 2000.

Datacasting is another example of convergence. Data services, such as email, home shopping, and banking, will be able to be accessed either through digital television sets or through use of a set top box in conjunction with an analogue television set.

Under the *Broadcasting Services Amendment (Digital Television and Datacasting) Act 2000*, the use of digital television is permitted in the provision of datacasting services which utilise broadcasting services band spectrum. Datacasters will be able to provide short news, business information, and weather overview bulletins, except in formats that resemble existing broadcasting. They will also be able to offer services outside these genres, such as programs providing information on products and services, educational programs, foreign language news bulletins, and home shopping, banking and bill paying transactions.

Datacasters will be able to provide their customers with individual point-to-point connections to the Internet, thus enabling a datacaster to function as an Internet service provider as well as a provider of content.

Datacasting using spectrum outside the broadcasting services band will not be subject to controls.

While basic datacasting services are one directional, meaning a separate return path is required for a fully interactive response from the user, some quite sophisticated pseudo-interactivity is expected to be available. Technological developments are also likely to enable a return connection from a datacast user, using ultra high frequency spectrum.<sup>90</sup>

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85 *Exchange*, 16 June 2000, p. 2.

86 *Exchange*, 16 June 2000, p. 2; NorthVoice media release, at [www.northvoice.ca/us/](http://www.northvoice.ca/us/), 5 June 2000.

87 *Exchange*, 16 June 2000, p. 2; [www.globaldial.com.au](http://www.globaldial.com.au).

88 Datafast Telecommunications, media release, 3 March 2000.

89 CWO, media release, 8 August 2000.

90 AIEAC, *National Bandwidth Inquiry*, p. 251, notes that the European Union has been working since March 1998 on such an interactive terrestrial television project, and that such a system is likely to be introduced in Australia in 2001.

Austar considers that digital, interactive television services will enable wide spread, low-cost solutions to consumers' needs for data communications, since most homes already have a television set and it is a 'user-friendly' medium.<sup>91</sup> Telecasters Australia also considers 'the introduction of digital television and the auction of national/regional datacasting licences will enable broadcasting services to be a dominant broadband gateway into the home—particularly in regional Australia where other delivery mechanisms are hampered ...'<sup>92</sup>

## TOWARDS PERSONAL COMMUNICATIONS

Communications services are becoming increasingly personalised. Advances in technology and increased diversity in consumer preferences is leading to an environment where individuals require personal communications services which are delivered flexibly across any device.

Unified messaging is one example of this trend. Essentially it brings together messages from different sources (voice, fax and email), thus enabling access through a personal computer, telephone or palmtop device. With WAP technology, it will be possible to send and receive these messages on a mobile phone.

Ovum predicted widespread take up of unified messaging, suggesting it would be almost universal by 2006. Global revenue is expected to rise from \$US10 million in 1998 to \$6.3 billion in 2002.<sup>93</sup>

In Australia, JFAX and mBox.com offer unified messaging and have reportedly experienced strong growth in their customer base. mBox enables customers to dial into an account to receive voice mail and email. It claims to have signed up over 110 000 users since January 2000.<sup>94</sup> JFAX provides a service where users may send and receive faxes and voice messages via email. They may also dial into an 1800 number and listen to their emails or fax headers.<sup>95</sup>

Technological changes in the telecommunications sector not only provide new avenues to meet customer needs, but also increase the commercial risk associated with operating in the industry. Telecommunications is a capital intensive industry. The costs of investing in new technologies are high and there is the attendant risk that a new, more effective, platform will be developed.

### FINDING

**Rapid growth in data and mobile communications and increasing convergence between technologies will mean more commercial opportunities, but also increased commercial risk. A raft of new technologies and products are likely to be available over the next five years.**

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91 Austar, submission, p. 2.

92 Telecasters, media release, April 2000.

93 *Australian Financial Review*, Special Report – Telecommunications, 19 June 2000; *Exchange*, 3 December 1999, p. 6.

94 *Exchange*, 11 August 2000, p. 12.

95 [www.jfax.com.au](http://www.jfax.com.au)

## GOVERNMENT INTERVENTIONS

The Commonwealth Government's decision to implement important reforms to the Universal Service Obligation (USO) and the ongoing effect of the Networking the Nation and related Social Bonus programs have the potential to impact on the standard of telecommunications services enjoyed by many Australians.

### USO CONTESTABILITY

The Government intends to introduce contestability arrangements for the USO:

- ▶ a contestable tender for combined obligations to provide untimed local calls and related services to customers in Telstra's 'Extended Zones' and to become the universal service provider in those areas; and
- ▶ two pilots for regional USO contestability schemes.

A number of submissions to the Inquiry have suggested that the introduction of contestability into the USO will have the effect of noticeably improving services available in regional, rural and remote Australia.<sup>96</sup>

*Competitive provision will dispense with reliance on theoretical econometric models acting as a proxy for competition, by allowing the more effective and fair operation of market forces to deliver real benefits to customers. By giving other carriers the opportunity to get access to the USO subsidy, the Government creates an incentive for a carrier to provide a service where it did not previously provide a service, and also to provide a service that is superior to that offered by a competitor.<sup>97</sup>*

Support for USO contestability has also come from telecommunications economists and other industry commentators, both in Australia and overseas.<sup>98</sup> The National Farmers' Federation considers USO contestability will be 'a great step forward', with 'potential to deliver real opportunities to rural and regional Australia'.<sup>99</sup>

### THE EXTENDED ZONES TENDER

Approximately 40 000 consumers who live in areas known as 'Extended Zones' have no (or limited) access to untimed local calls. Consumers outside the Extended Zones have a legislated right to untimed local calling, based on the rights such consumers enjoyed in July 1991. The Extended Zones, which cover about 80 per cent of the Australian land mass, are shown in Figure 7.7.

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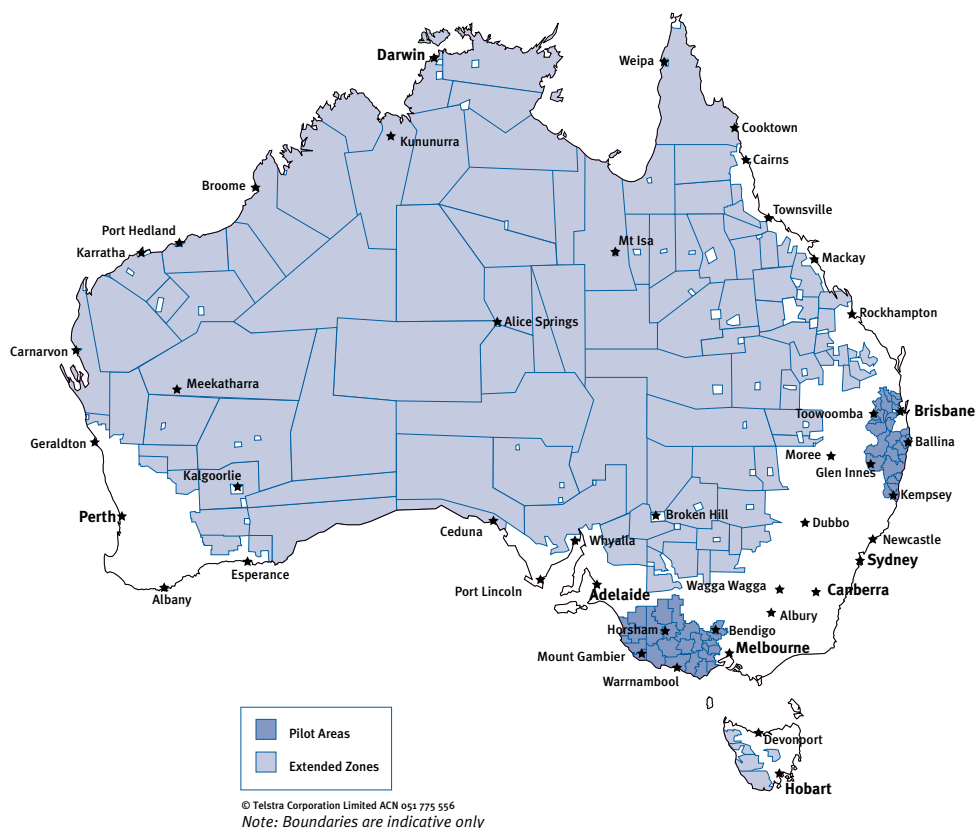
96 These include CWO, submission, p. 22; Auspace, submission, p. 2; Vodafone, submission, p. 5; AAPT, submission, section 4.5.

97 Vodafone, submission, p. 5.

98 For example, Professor Rodney Maddock, La Trobe University, *Tendering for Universal Service Provision*, January 1999; Professor Dennis Weller, *Auctions for Universal Service Obligations*, Telecommunications Policy 23 (1999), p. 645.

99 National Farmers' Federation, media release, 23 August 2000.

**FIGURE 7.7: EXTENDED ZONES AND USO CONTESTABILITY PILOT AREAS**



Enabling legislation for the extension of untimed local calls to the Extended Zones was passed in July 1999. It provided funding of up to \$150 million over three years commencing in 1999-2000 for an infrastructure upgrade. The Government decided to conduct a tender process to select the recipient of the funding allocation.

The successful tenderer will also be declared the universal service provider and be eligible for exclusive USO subsidies for three years. Other service providers may provide services in the Extended Zones during the contract term.

The \$150 million allocation provides an opportunity to leverage a better communications outcome for rural and remote Australia. The ‘beauty contest’ style tender for provision of the standard telephone service in the Extended Zones will test the competing claims of Telstra and other service providers regarding their capacity to serve rural and remote Australia.

The Department of Communications, Information Technology and the Arts (DOCITA) has told the Inquiry that, following a registration of interest process, a Request for Tender will shortly be issued to seven companies (AAPT, CWO, Datafast Telecommunications, Heartland, Pacific Telco, Telstra and Vodafone), with a view to selecting and concluding an agreement with a preferred tenderer as soon as practicable.

The Inquiry is aware that a number of tenderers are proposing to offer a range of high speed data and other services that would significantly improve the quality of telecommunications services in the Extended Zones.

CWO indicated to the Inquiry that it will provide a wide range of services in the Extended Zones if successful in the tender and will bring down the costs of satellite customer equipment substantially. CWO has indicated that a data capability of 28.8 kbps will form part of its standard service offering under the tender, with higher data speeds and other additional services, such as pay TV, access to free to air TV and radio and multiple lines to one customer comprising optional service offers.<sup>100</sup>

Another tenderer, Heartland Communications, announced it would be offering a range of enhanced services to regional, rural and remote Australia—regardless of the tender outcome. Heartland's goal is to provide regional Australia, particularly regional businesses, with broadband telecommunications solutions encompassing two-way satellite technology and wireless local loop solutions.<sup>101</sup>

#### FINDING

**The Extended Zone untimed local call tender is likely to lead to a substantial improvement in services to consumers in these zones.**

## CONTESTABILITY PILOTS

The Government will conduct two pilot schemes for competitive delivery of the USO in regional areas. Both trials will enable carriers to compete with Telstra for subsidies to provide standard telephone services that would otherwise be uncommercial.

One of the two pilot projects involves the Greater Green Triangle (GGT) region of south-west Victoria and south-east South Australia, expanded to include the Central Goldfields and Greater Bendigo. The second pilot will be conducted in north-east New South Wales and the Queensland Downs. The pilot areas are shown in Figure 7.7.

The GGT has received funding support under the Government's \$70 million Building Additional Rural Networks program, which supports the development of innovative market models for the delivery of regional communications services, including new kinds of community-owned or regionally-based carriers.<sup>102</sup> This pilot will help test the importance of supplementary funding in facilitating contestable USO arrangements.

Carriers will be required to pre-qualify with the Australian Communications Authority (ACA) to become a universal service provider (USP) in the pilots.

All USPs will be able to offer an ACA-approved alternative telephone service, such as mobile services or a service providing enhanced Internet access, which would be eligible for the subsidy. Consumers will be able to choose either the standard Telstra offering, or an alternative offering from Telstra or a new service provider. Measures will be put in place to prevent 'cherry picking' (servicing high but not low value customers) in contestable areas.

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100 CWO, submission, pp. 18, 19; CWO – Inquiry communication.

101 Heartland Communications – Inquiry communication; *Exchange*, 25 August 2000, p. 5.

102 Department of Communications, Information Technology and the Arts, *Regional USO Contestability Pilots – Factsheet*, [www.dcita.gov.au](http://www.dcita.gov.au). Further details of the GGT model are provided in NECG, pp. 67–72.

USPs supplying the standard telephone service will be required to meet standard regulatory requirements in relation to the service. These include an untimed local call option, pre-selection and emergency facilities, and disability equipment where relevant.

Telstra will be required to remain in the pilot areas as the primary USP, and must continue to offer its existing standard service, thus ensuring all consumers continue to be served. Telstra will be able to exit the market only when another carrier agrees to take its place. Telstra's existing standard service offering will continue to be subject to price cap arrangements.

The current USO model was established in an era in which many of Australia's regional markets were natural monopolies. In this circumstance, the subsidisation of one provider was an effective policy tool. Technological advancements suggest that most, if not all, those natural monopoly characteristics no longer remain. The existing restrictive subsidy scheme can now have the effect of discouraging competitive entry by forcing potential entrants to compete with an entrenched and subsidised incumbent in less commercially attractive markets.

#### FINDING

**USO contestability will reduce barriers to entry, particularly in regional areas, and should lead to increased competition and service improvement.**

## GOVERNMENT FUNDING ASSISTANCE

The Networking the Nation (NTN) program and the Social Bonus arising from the second partial sale of Telstra provide a further mechanism for meeting the needs of telecommunications consumers, particularly in regional, rural and remote areas.

In 1997, \$250 million was allocated to NTN over a five-year period. An additional \$214 million was allocated to NTN from the Social Bonus package, providing total funds of \$464 million. Further funding for regional, rural and remote areas from the Social Bonus is available for telecommunications programs falling outside of NTN. These include the \$150 million for untimed local calls in the Extended Zones, \$25 million for mobile phone coverage along major highways and \$70 million to improve service delivery to small rural communities through the Rural Transaction Centres (RTC) program.<sup>103</sup> Not specifically targeting regional communities, the \$158 million Building IT Strengths (BITS) program is intended to promote the growth of new and developing innovative IT and telecommunications businesses.<sup>104</sup> Further details of the NTN and Social Bonus programs are given in Appendix F.

The Government has primarily used NTN funding as a catalyst for promoting investment by the commercial sector in marginal or uneconomic markets. Commercial organisations are ineligible to apply for NTN funding.

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103 As at 5 September 2000, over 270 communities have received funding under the RTC program to establish centres in their townships. RTC funding helps provide services like banking, Medicare *easyclaim*, insurance, business support, office space, Internet and a range of government services.

104 The 'Advanced Networks' sub-program of BITS—launched by the Minister on 10 September 2000—is intended to support the development, trialing and demonstration of advanced communications networks. The Government expects the program to be crucial in areas such as telemedicine and tele-education.

Projects funded through NTN are a mix of supply and demand side strategies, but all projects respond to an identified community need. Where infrastructure has been funded directly, e.g. the provision of Internet points of presence, additional funding is usually provided for services and facilities to encourage use of the infrastructure.

*[W]ith [the] Networking the Nation fund, it's not only about infrastructure, that's why we called our project Bridge IT, it's bridging the gap between having infrastructure and being able to utilise it, even if it's limited which in a lot of cases ours is. There are a lot of people with great infrastructure who are not using it effectively. We don't only want the infrastructure, we want people to be trained and have that awareness of how they can use it for their benefits. Things like teleworking provide fabulous opportunities for people who live remotely.*<sup>105</sup>

A classification of NTN funding by project type and state or territory is also provided in Appendix F. Projects supported through the program are diverse, ranging from initiatives to provide training and raise community awareness of telecommunications and information technology applications, to the delivery of online services and information, and the provision of new and/or enhanced infrastructure.

While many positive views were expressed about NTN, some submissions to the Inquiry suggested that funding allocations have been too fragmented, as a result of the 'bottom-up' approach, where funding allocations depend largely on applications from local communities or end-users. Submissions from some States and Territories raised this concern and called for a more strategic approach to funding, involving a recognition of scale economies and the benefits of partnerships between local government and regional development bodies, State and Territory governments, industry and the Commonwealth.<sup>106</sup>

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<sup>105</sup> Chris Capel, Queensland Rural Women's Network, Longreach roundtable meeting, 20 June 2000. Larry Acton commented at the Roma roundtable meeting on 20 June 2000 that NTN funding is an important catalyst for local community involvement.

<sup>106</sup> For example, SA Government (Information Economy Policy Office), submission, p. 9; Queensland Government, submission, p. 15.



## CASE STUDY—CENTRAL WESTERN QUEENSLAND

Three separate organisations have received project funding for the remote Central Western Queensland region, an area of approximately 400 000 square kilometres, which supports a population of about 13 000.

- ▶ Barcaldine Shire Council, in association with Blackall Shire Council, received up to \$80 000 to install the required infrastructure to provide mobile telephone coverage for the towns and surrounding districts of Blackall and Barcaldine.
- ▶ Boulia (population 561), at the far western edge of the region, received up to \$200 000 for a public Internet access centre in the local library. Funding was also provided for an awareness-raising and training program, and a video-conferencing facility.
- ▶ The Central Western Queensland Remote Area Planning and Development Board, comprising the eleven shires of the region, received funding of up to \$447 100 for a multi-faceted project to meet immediate and future needs for information access, and to develop a telecommunications and IT strategy for the region. Funding will enable telecentres in the towns of Winton and Barcaldine, an Internet cafe in Longreach and community Internet access points in the smaller communities of Jundah, Windorah, Birdsville and Bedourie.

The Aboriginal and Torres Strait Islander Commission (ATSIC) and the National Indigenous Media Association of Australia (NIMAA),<sup>107</sup> claimed that the NTN's current guidelines and operation favour those communities which are proactive, and called for strategies to ensure that Indigenous communities have equitable access to funding.

Others claimed that Telstra—as the incumbent carrier—is favoured in supply contracts funded through NTN.<sup>108</sup> CWO considered Telstra's existing rural infrastructure and USO subsidy creates a substantial competitive advantage.<sup>109</sup> Vodafone too expressed concerns about the competitive neutrality of NTN funding of terrestrial mobile infrastructure.<sup>110</sup>

It is apparent from the Inquiry's consultations that some regions and communities have benefited more than others from the operation of the NTN and Social Bonus programs. Some communities may lack the necessary skills to develop an appropriate proposal and funding application, while others who receive funding may lack the technical and commercial skills required to fully implement the proposal. It is important that the guidelines and operation of the NTN do not discourage more disadvantaged communities from applying for and obtaining funding, and that there be an appropriate emphasis on awareness-raising and training in projects funded under NTN.

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107 ATSIC, submission, p. 4; NIMAA, submission, p. 3.

108 CWO, submission, p. 23; Heartland Communications, submission, p. 4.

109 CWO, submission, p.23.

110 Craig Norton, Vodafone, Industry roundtable meeting, 12 July 2000.

Equally, it is important that the Government learn from the successes and failures of the new market models to date, particularly those which have received Government funding. Consultants to the Inquiry found that while most of the Australian models are in the early stages of development, some general observations could be made about the factors that are likely to influence their success.<sup>111</sup>

A number of commercial new market models examined, such as TransACT, Soul Pattinson Telecommunications, Datafast Telecommunications and Palo Alto, benefit from incumbency in other industries. Benefits include access to infrastructure, such as ducts, poles or towers, land access powers and an existing customer base. The consultants concluded that the benefits of incumbency and relationships with parties with an inherent capability to provide strategic site access provide a major competitive advantage in the start-up phase.<sup>112</sup>

## CASE STUDY—WESTERN AUSTRALIAN TELECENTRE NETWORK

NTN funding is assisting the spread of online resources to rural small towns and remote settlements in Western Australia. Over \$4.5 million in assistance has been provided for the telecentre network, which provides rural communities with access to online facilities such as banking, training opportunities and government information.

The network will be extended from 40 to 100 telecentres by 2001. NTN will fund an additional 38 telecentres.

Communities of less than 200 people not currently served by the telecentre network can apply for funding assistance for Telecentre Access Points (TAPs). The TAP is the primary telecentre building block for remote sites. In addition, communities lacking facilities to accommodate a telecentre may obtain funding for a modular facility enabling access to talkback TV, two-way video conferencing, email, and Internet services. Seven such facilities are expected to be constructed with funding assistance from NTN.

NTN also provided funding for the Western Australian Visually Online project, which provides videoconferencing facilities in telecentres.

Other factors that NECG considered important to the establishment and early success of new market models are the existence of a core customer base, such as a local council or a coalition of councils; the availability of Government funding for the planning phase; and the existence of a local ‘champion’—with the necessary technical and commercial skills—to work with the community and key stakeholders.<sup>113</sup>

The consultants also concluded that success depends on private sector disciplines and sound risk management practices. Models involving local utilities or broadcasters can achieve economies of scope, and so minimise risk.

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<sup>111</sup> NECG, section 2.5.

<sup>112</sup> NECG, p. 30.

<sup>113</sup> NECG, sections 2.10, 2.11 and 2.14.

Other market models involving local authorities may not be able to manage risk as well, being unable to spread risk by holding assets across a range of localities.<sup>114</sup>

Further, NECG noted the importance of conforming with competitive neutrality principles. For example, the use by a local government authority of its planning powers to advantage a local provider with whom it has a relationship (rather than allocating resources by means of an open, competitive tender) could lead to inefficient outcomes.<sup>115</sup>

#### **FINDING**

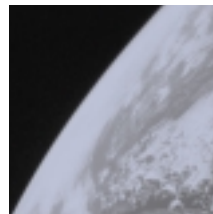
**The NTN and Social Bonus programs have facilitated, and will continue to facilitate, improvements in regional Australian telecommunications. It appears, however, that some communities have benefited more than others. There are lessons that can be learnt from projects supported so far which should be used to improve Government assistance for regional strategies and commercially sound projects.**

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<sup>114</sup> NECG, pp. 45, 46.

<sup>115</sup> NECG, pp. 46, 47.

## CHAPTER 8 CONCLUSIONS AND WAY FORWARD



The telecommunications sector in Australia is experiencing unprecedented change. Technological and market developments are transforming the environment within which the industry operates. Many of the broad products that are part of this Inquiry's analysis, such as the Internet and mobile telecommunications, are at relatively early stages of their lifecycle. The key drivers of future demand for broadband services are not yet clear. Governments are seeking to both shape the community's future use of communications services and to create a policy environment which encourages the sector to best deliver those services.

Community expectations of telecommunications services are also changing—driven in part by Government policy statements regarding the potential benefits of the information economy. Some of those expectations reflect what may be possible, rather than what is possible today or, indeed, what is available today.

This environment of change is also reflected in the industry's regulatory framework. Australia's open telecommunications market is still a relatively recent phenomenon and telecommunications providers continue to position themselves in the new marketplace with an eye to future trends. The Government has recently launched a review of the competition-related aspects of the regulatory regime and is proceeding to implement reforms to the Universal Service Obligation (USO) which will incorporate a level of contestability into that service obligation. Telstra is also conducting a review of its telephone call zoning system, an area of significant interest to many of those who made submissions to this Inquiry.

The complexity and speed of industry change presents great challenges for public policy. It also makes more complex any assessment of industry performance.

### CERTIFICATION

Analysis undertaken so far suggests that the telecommunications sector is making significant strides in bringing new and innovative telecommunications services to the Australian consumer. Since the market was opened to full competition, major developments have taken place in the structure of the market, and it is likely that these will continue unabated.

The market research completed by this Inquiry indicates that most Australians have a broadly positive view of the telecommunications sector and its performance. This research appears to be confirmed by the surveys undertaken by the Australian Communications Authority.

Nevertheless, the Inquiry found that some sections of the Australian community have real concerns regarding the telecommunications services they receive. They include:

- ▶ the performance by Telstra regarding fault repairs, evidence of isolated cases where Telstra’s performance is well outside the Customer Service Guarantee (CSG) standard, and unacceptably high levels of basic telephone fault rates in localised areas;
- ▶ a small but significant minority of customers (many of whom are rural and remote residential and small business customers) are disadvantaged in lacking the option of reasonable access to the Internet over their telephone line, some effectively lacking any access at all; and
- ▶ evidence that the data needs of some major organisations with a presence in regional, rural and remote areas are not fully being met by the telecommunications industry.

The Inquiry also noted high levels of dissatisfaction among many consumers across Australia, but most particularly in rural and remote areas, regarding day-to-day interaction with their service providers—predominantly Telstra. This includes:

- ▶ perceptions of a lack of understanding by staff of local circumstances;
- ▶ difficulties for consumers in managing service concerns where there are multiple interactions with call centres;
- ▶ claims of inefficiencies in service operations on the ground;
- ▶ deficiencies in local engagement with consumers and regional bodies on service issues and network improvement plans; and
- ▶ difficulties for consumers in accessing broad advice on their telecommunications service options and technical issues, such as Internet access.

These issues should be a matter of public policy concern.

However, the Inquiry found that the level of competition across urban, regional, rural and remote Australia should strengthen significantly over the next few years—chiefly as a result of increased competition and the effect of key Government interventions, particularly the introduction of contestability into the USO.

## CERTIFICATE

The Inquiry has concluded that Australians generally have adequate access to a range of high quality, basic and advanced services comparable to the leading information economies of the world. The Inquiry research indicates Australians who live in metropolitan and regional centres enjoy good telecommunication services and are generally satisfied with them. However, a significant proportion of those who live and work in rural and remote Australia have concerns regarding key aspects of services which, at this stage, are not adequate. Their concerns relate primarily to

- ▶ the timely installation, repair and reliability of basic telephone services;
- ▶ mobile phone coverage at affordable prices; and
- ▶ reliable access to the Internet and data speeds generally.

The Inquiry's analysis suggests that the continued development of competition throughout Australia, combined with key government initiatives (such as USO contestability) will have a positive effect on services over the next few years. These developments are likely to materially improve the services available to rural and remote consumers.

The policy discussion and recommendations which follow provide a framework in which to consider and address identified areas of concern to ensure the telecommunications sector will continue to improve the services available to all Australians.

## OBJECTIVES

The objectives of the *Telecommunications Act 1997* are to promote the:

- ▶ long-term interests of all users of telecommunications services; and
- ▶ efficiency and international competitiveness of the Australian telecommunications industry.

These objectives recognise that the industry, and thus the regulatory framework which surrounds it, should be primarily directed at meeting the interests of telecommunications consumers and providing a competitive telecommunications sector within the Australian economy. The Inquiry endorses the broad policy objectives described by this legislation.

However, many in the community look to the opportunities presented by new telecommunications technologies to achieve outcomes across a wide range of areas, including service delivery in health, education, finance, and government sectors—especially in non-metropolitan locations. The development of the information economy and e-commerce also offers new opportunities for participation in trade and commerce.

The Inquiry acknowledges the benefits for individuals, communities and the nation in exploiting these opportunities—most notably:

- ▶ to ameliorate the effects of isolation in remote communities by bringing about improved delivery of a range of important community and business services;

- ▶ for regional, rural and remote communities to benefit economically from the competitive gains and opportunities presented by the information economy; and
- ▶ to assist in regional economic development and social cohesion.

These perspectives present new challenges for government policy. It is unlikely that effective outcomes would be achieved if the telecommunications-related aspects of these issues were addressed in isolation from broader policy strategies. Similarly, issues should not be taken purely from a telecommunications-specific perspective, since the best solution may not be a telecommunications one.

## STRATEGIES

Over the last decade there has been a large shift in the strategies used by the Commonwealth Government to achieve its telecommunications policy objectives. This shift has involved placing primary emphasis on competitive pressures to drive industry outcomes and, more recently, greater use of government interventions to achieve regional or sectoral—rather than national—outcomes.

Prior to 1989 the Australian telecommunications industry:

- ▶ had a broadly homogeneous product (voice telephony) the demand for which was relatively easily predicted;
- ▶ was characterised by a small number of Government owned operators with a monopoly in their own areas of activity; and
- ▶ policy objectives were primarily aimed at achieving universal access to a standard voice service.

Competition played no role in the market.

Since 1989, competition has been progressively introduced into the Australian telecommunications sector.

With the opening of the telecommunications market to full competition in 1997, competitive pressures have become the primary mechanism by which the Government has sought to meet the telecommunications needs of all Australians. Interventions to supplement competitive pressures were established through regulatory obligations in telecommunications legislation—most notably, the USO, CSG, and regulation of pricing including the untimed local call obligation and those applying to Telstra.

These interventions are characterised by:

- ▶ providing a ‘safety net’ set of guaranteed service outcomes—focused on the standard or voice telephone service; and
- ▶ assumptions of a common set of service requirements across all affected consumers.

In more recent times, new policy interventions such as the Networking the Nation (NTN) program, other Social Bonus initiatives and the decision to pursue contestability for the USO suggest a trend towards the increasing use of measures addressing specific sectoral or geographic needs—rather than common national outcomes.

The NTN and Social Bonus initiatives represent a new strategy of intervention which aims to encourage service improvement in particular regions, or for particular user groups.

Contestability in the USO raises the prospect of different universal service providers with different infrastructure platforms meeting the safety-net needs of different regions. Further, new regional universal service providers may introduce additional services capable of being supplied over those new platforms.

## NATIONAL VERSUS TARGETED STRATEGIES

The continuing and ever increasing speed of change in consumer demands and expectations is reflected in the diverse range of new products and service requirements. Different segments of the broad consumer market place varying priorities on the range of telecommunications services available today.

Such diversity presents a significant challenge to a ‘national standard’ approach to telecommunications policy. A policy approach based on an assumption that a single set of requirements can be mandated is less and less likely to meet the community’s real needs, while being more likely to incur large costs to the community.

Even if it were possible to determine today what are reasonable safety-net requirements for all Australians, it is almost certain that these will have changed within a few years—most probably before any such new standard could have been universally implemented.

In short, a supply-side policy approach to telecommunications policy is unlikely to be capable of fully addressing current and future consumer demand.

### FINDING

Telecommunications policy measures need to reflect the increasing diversity of telecommunications requirements across Australia.

## TOOLS

Governments in Australia and overseas have used a number of policy tools to ensure that the interests of consumers and the wider community are met. Striking the right balance between exploiting competitive pressures and using regulation or intervention through government programs to achieve community objectives in telecommunications can be complex and difficult.

## COMPETITION

Competition in the Australian telecommunications industry has forced prices down, encouraged product, service and price innovation and attracted significant additional investment from new entrants.

Many new technologies and services to meet consumer needs would not have been possible without the powerful mechanism of competition.

However, competition can develop unevenly, particularly in a sector still transforming from a former monopoly structure, and with new competitors establishing a commercial base



in the more attractive urban markets. This also applies to the introduction of new services or products. Such time delays can also have a negative effect on community and economic welfare if a proportion of the population are persistently disadvantaged in their ability to participate in the information economy.<sup>1</sup>

The National Bandwidth Inquiry found that competition remains limited in regional areas, both in backbone capacity and the customer access network. It predicted that over the next five years real improvements in the level of competition in the industry will occur in most areas of Australia.<sup>2</sup>

This is already happening. There have been some notable developments during the course of this Inquiry regarding new competitive entry in both backbone and access networks spanning urban, regional, rural and remote markets. Nevertheless, the lead-time for some of these plans suggests that the full benefits of a competitive environment are some way off for many parts of Australia.

In addition to time delays, competition alone may fail to meet some of the service requirements of parts of the community. These may include geographic areas or particular market segments where demand levels do not attract commercial supply.

#### FINDING

**Competitive pressures will, in most markets, be the best mechanism to ensure the telecommunications needs of Australians are met. However, competition will not be effective where it has yet to fully develop or in markets which are not commercially attractive.**

## GOVERNMENT INTERVENTION

Governments usually intervene in markets for two broad reasons: to address a failure in the operation of those markets, or to achieve identified public interest objectives where an effectively operating market may be unlikely to ensure those objectives are met.

The trend of government telecommunications policy indicates that interventions over the last decade have tended to take two forms—regulation and funding programs.

Regulatory interventions seek to change the way the industry acts, either by establishing firm rules or by creating incentives. While transparent regulation can provide the community and industry with some certainty, it can also have a number of potential weaknesses. Regulation which seeks to control or guide how a company operates can become complex. It can fail to reflect the differing priorities and preferences of different customers, have unintended consequences, and dissuade competitors from entering markets.

Where regulation seeks to predict the outcomes that a fully competitive market would otherwise achieve, intervention represents a second best solution.

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1 Dr Terry Cutler, submission, p. 8.

2 Australian Information Economy Advisory Council, *National Bandwidth Inquiry: Report of the Australian Information Economy Advisory Council*, May 2000, p. 208.

#### FINDING

Regulation is not as effective as a fully competitive market in meeting consumer and community needs. Regulation plays a necessary role where competition is not mature or where public interest outcomes are not likely to be achieved through competition alone. However, it should be avoided where competition is working and should be carefully designed, and regularly reviewed, to ensure it does not discourage the development of competition.

## UPGRADING THE UNIVERSAL SERVICE OBLIGATION

It was suggested to the Inquiry that the Government ensure all Australians have access to advanced telecommunications services through an upgrade to the service requirements within the Universal Service Obligation (USO).

Proposals that the USO be upgraded to include a minimum data speed and, less often, a mobile telephony component, were generally based on:

- ▶ claims that such a service is now an essential or integral component of the telecommunications requirements of all Australians;<sup>3</sup>
- ▶ arguments that an equitable standard of telecommunications service for all Australians can only be maintained by revising the USO to take into account technological advances;<sup>4</sup> and/or
- ▶ the public benefits which would arise from the improved ability to deliver an array of services by means of the telecommunications network.<sup>5</sup>

Less often, it is suggested that the government should use the USO as a means of driving the future development of the telecommunications sector. For example, the Queensland Government argued in its submission that the USO should be used ‘to progress delivery of the advanced telecommunications services Australians will require in the information age’.<sup>6</sup>

A number of commentators, both in Australia and overseas, have suggested that for a service to be incorporated into the USO, it should be an ‘essential’ service.<sup>7</sup> The United States *Telecommunications Act 1996* provides for the periodic definition of ‘universal service’ by the Federal Communications Commission. Regard must be had to whether the service is ‘essential to education, public health, or public safety’ and whether ‘through the operation of market choices by customers, [the service has] been subscribed to by a substantial majority of residential customers’.

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3 For example, Jeremy Watson, Office of Communications, Science and Advanced Technology, Darwin roundtable meeting, 3 July 2000.

4 For example, Agforce Queensland, submission, p. 2.

5 For example, Robert Martin, Information Economy Policy Office, Adelaide roundtable meeting, 5 July 2000.

6 Queensland Government, submission, p. 4.

7 Bureau of Transport and Communications Economics, *Communications Futures Project*, AGPS 1995. OFTEL, *Universal Telecommunications Services: A Consultative Document on Universal Service in the UK, 1997*. Xavier, P., *Universal Service and Public Access in the Networked Society*, Telecommunications Policy Vol 21, No 9/10, 1997.

A study undertaken for the European Commission concluded that for a service to be considered for incorporation into the USO, 'it ought to have already grown to a 75 per cent market penetration under normal market conditions.'<sup>8</sup> The report noted that universal service policy should not be used as a means of initiating the rollout of new services given the potential for such an approach to lead to inefficient investments.

One of the objectives of the Australian *Telecommunications Act 1997* is to ensure that 'carriage services of social importance are readily accessible to all people in Australia on an equitable basis' and are supplied as efficiently and economically as possible.<sup>9</sup>

Current take-up rates for Internet services in Australia would not meet the tests in the US legislation or the EU report. While market predictions suggest levels will grow over the next few years, there are a number of factors against an early extension of the USO to these services.

The rapid and continuing development of these technologies make it very difficult to determine what is a minimum 'essential' service. The lack of agreement regarding what constitutes a basic data speed was clear from the range of views expressed to the Inquiry. The only conclusion which seems clear is that data requirements will continue to change.

In this context, the Inquiry notes the decision of the Canadian Radio-Television and Telecommunications Commission (CRTC) in 1999 not to upgrade the Canadian basic service obligation. In that decision, the CRTC acknowledged the technical difficulties which would be faced by carriers in guaranteeing a data transmission speed, the cost associated with an upgrade to 28.8 kbps or higher, and the impact that cost would have on the operation of both profitable and unprofitable markets.<sup>10</sup>

A minimum data requirement in the USO is also likely to have the effect of requiring a significant investment in upgrading the Telstra customer access network.

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8 Analysys, *The Future of Universal Service in Telecommunications in Europe: Final Report for EC DGXIII/AI*, 1997, p. 123.

9 Section 3(2)(a), *Telecommunications Act 1997* (Cth).

10 Canadian Radio-Television and Telecommunications Commission, Telecom Decision CRTC 99-16 *Telephone Service to High-cost Serving Areas*, paragraphs 26 and 27.

## THE COST OF UPGRADING THE USO USING TELSTRA'S TELEPHONE NETWORK

A brief analysis shows there would be significant costs associated with upgrading Telstra's existing network. Given the existence of alternative networks capable of delivering high speed data to all consumers, the benefits of a large investment in Telstra's telephone network to increase data speeds must be questioned.

The Australian Communications Authority (ACA) in its 1998 Digital Data Inquiry report estimated that the cost of upgrading Telstra's customer access network to a minimum data speed of 28.8 kbps would be in the order of \$4 billion. The ACA also found that an upgrade to a data speed lower than 28.8 kbps would incur very similar costs.

Telstra estimates the capital cost of upgrading its network to provide a minimum data speed of 33.6 kbps would total \$4.486 billion. Telstra did not provide an estimate of the operating and maintenance costs, although these could be expected to be minimal given it already incurs such costs with its existing network.

Drawing on the analysis by the ACA in its Digital Data Inquiry report and information provided by Telstra regarding the existing number of customers who already access data speeds of 64 kbps, the Inquiry estimates the following costs would be incurred in providing all customers with 64 kbps using ISDN.

- ▶ The capital cost of network upgrades required to Telstra's access lines which cannot currently access ISDN, is approximately \$2.5 billion.
- ▶ The cost of upgrading customer equipment to enable the supply of ISDN is \$1240 per customer.

Given that some 1 million customers have taken up ISDN services, around nine million customers would require upgraded customer equipment. The total cost for this would be in the order of \$11.5 billion. The total cost of the upgrade would therefore be approximately \$14 billion.

The Communications Research Unit (CRU) of the Department of Communications, Information Technology and the Arts, was also asked to provide an estimate of the likely cost of upgrading the USO to at least 64 kbps based on the Digital Data Inquiry findings and other available information. The CRU advised that the likely cost would be in the order of \$20–30 billion.<sup>11</sup>

Despite the variation between the cost estimates for an upgrade to 64 kbps, it is clear that the total cost is large and would be ultimately borne by all consumers through their telephone bills.

11 This was based on costs for three areas:

- ▶ capital costs for customer equipment in the order of \$10bn (the CRU assumed the use of a number of technologies including ADSL);
- ▶ network upgrade costs for both CAN and backbone in the order of \$10bn; and
- ▶ operating costs in the order of \$6bn.

The reason for the discrepancy in the two estimates is partially explained because the ACA analysis assumed ISDN would be an optional service with universal availability but low take-up. The CRU, however, assumed all existing lines would be upgraded to a 64 kbps capability. This would be the effect of a USO upgrade and, the CRU advised, would likely result in a significant expansion in capacity requirements of the backbone network.

Also, Telstra's customer access network was designed primarily for voice telephony and, while it has been enhanced by the introduction of ISDN and ADSL capabilities, it is not suited to providing a national broadband network. High speed data services are delivered through a number of different platforms, many of which are offered by new competitors. Incorporating a minimum data requirement into the USO is likely to impact adversely on the development of competition in the industry, both by imposing higher USO levies on Telstra's competitors, and by further entrenching subsidisation of the incumbent in USO net cost areas. Such a development may well have the perverse effect of dissuading innovative alternative providers from entering regional markets.

The National Bandwidth Inquiry noted these threats in the following terms:

*[I]f we require the delivery of new services on a highly cross-subsidised, uniform priced, basis (the telephony legacy model), then we reduce or eliminate the prospect of competitive entry and discourage the incumbent from further investment and service improvement in non-profitable or less profitable areas of the market. At the same time, the maintenance of a cross-subsidy based regime results in prices in more profitable areas of the market being higher than would otherwise be necessary. Such an approach runs the real risk [that]... the supply of new services to meet the real needs of regional Australia is either further delayed or simply does not materialise.<sup>12</sup>*

The USO is a blunt policy tool, all the more so in a market with diverse needs. The USO may actually limit the potential for a competitive marketplace to develop appropriate product and service solutions.<sup>13</sup>

The USO is also not a policy tool without cost to the community: it is borne by consumers in their telecommunications bills. Any increase to basic costs can adversely affect those least able to absorb price increases, and damage the competitiveness of all businesses.

Noting the potential implications for Australia, the National Bandwidth Inquiry commented:

*At an obvious level, bandwidth is a cost input into the delivery of content products. If bandwidth costs are high, then this is likely to affect, possibly significantly, Australia's ambitions to become a provider of content to the world...*

*A related, but more subtle point, flows from the fact that the structure of the Internet provides many content creators (and e-commerce providers) with considerable flexibility in choosing locations for hosting material. A server in the US need look no different from a server based in Australia, as far as an end user is concerned. If bandwidth prices are lower there, then it is in fact likely that hosting will move. In turn, such a scenario:*

- ▶ *represents a loss of both direct and indirect business to Australia; and*
- ▶ *represents a risk that the supplier might move all of their business.<sup>14</sup>*

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<sup>12</sup> AIEAC, *National Bandwidth Inquiry*, p. xi.

<sup>13</sup> Milton Mueller noted in "Universal Service" and the new Telecommunications Act: Mythology Made Law ([www.vii.org/papers/cacm.htm](http://www.vii.org/papers/cacm.htm)) that 'Communications access is taking an ever-wider variety of forms, and there is a broad range of information transmitting and processing capabilities... [An expanded USO] overlooks the most promising feature of the new competitive marketplace: the enhanced ability to tailor the price and capability of service to specific user needs and socio-economic constraints... [An expanded USO] will simply waste a vast amount of resources on suboptimal solutions. Further, it may discourage the market from discovering and supplying the solutions that are optimal for various groups.' (p. 8).

<sup>14</sup> AIEAC, *National Bandwidth Inquiry*, p. 211.

Another argument in favour of upgrading the USO is that of equity. It was suggested to the Inquiry that principles of equity require that enhanced service obligations should also be applied in rural and remote Australia. However the Inquiry found that the defining factor is not a single capability available to all customers: rather, urban customers benefit from a range of choices regarding service and price.

Therefore, provision of equity for rural and remote customers should focus on providing equity in the level of choice available to those customers. The USO mechanism, which assumes a common set of needs and can limit competition, would not seem the most effective tool with which to promote an equity of choice across Australia.

It has also been argued that the USO should be upgraded to facilitate the improved delivery of services such as education, health or financial services. Given a 'one size fits all' approach is inappropriate, significant wastage of resources is risked if a 'universal' access policy is driven by the needs of particular sectors.

The Inquiry understands the frustration of those consumers in rural and remote areas whose basic telephone service is not even capable of transmitting a simple facsimile.

This frustration has been exacerbated by the promise of new technological solutions which on the whole have remained 'just around the corner' and in the apparently widening gap between their service capabilities and those of other Australians.

The Government's decision to invite tenders to provide USO services and untimed local calls in those areas which are currently Telstra's extended call zones has attracted interest from a number of potential providers.

The tender model, which encourages bidders to commit to service offerings over and above the minimum USO requirement has the real prospect of transforming the levels of service available to the approximately 40 000 consumers in those areas. In particular, the availability of \$150 million of upfront support has the potential to offset the substantial initial capital costs of a new entrant in this market.

It is reasonable to assume that the successful bidder may well offer, on a commercial basis, similar services in surrounding areas.

In addition to this tender process, the Government is pursuing further USO contestability pilots in a small number of regions outside the extended zone areas. These, too, are designed to establish competitive pressures which will encourage alternative providers to offer services over and above the minimum in order to attract market share.

Both these processes are positive developments, although it remains to be seen what impact they may have on the service levels experienced by those rural and remote customers who live outside regions affected by either process.

On balance, the Inquiry does not recommend upgrading the USO at this stage. However, if the contestability processes and other market developments do not have the effect of improving service levels, the Inquiry believes that the Government should reassess the USO mechanism.

The Inquiry does also acknowledge the importance of the concerns raised, and recommends a number of strategies to address them.

## FUNDING PROGRAMS

Governments also use funding programs to provide different incentives to the market.

Unlike regulation, incentive programs can be designed to be demand rather than supply driven. The Networking the Nation program is explicitly demand driven, depending on community-based development of funding proposals.

Program measures too can be more clearly aimed at encouraging competition.

Funding programs also have inherent risks: some suggestions have been made of a lack of a strategic approach within the Networking the Nation program and between the various telecommunications-related funding programs. The Inquiry agrees with the need for a more strategic approach and believes that appropriately structured and targeted funding programs can play a positive role in assisting communities to meet their communications needs.

## GOVERNMENT AS PURCHASER

Governments are significant purchasers of telecommunications services and have been involved for some time in implementing demand aggregation strategies for government traffic.

Substantial benefits can be derived from such strategies, particularly in regional areas, through:

- ▶ improving the quality and reach of communications services to regional users; and
- ▶ requiring contracted carriers/service providers to provide additional benefits to the regions—either as wholesale services to regional service providers, or as retail services to the general public.

To avoid any tensions between these all-of-State/Territory strategies, and regional initiatives, the Inquiry suggests that further coordination and consultation is needed at all levels to ensure activities are not inconsistent with regional service improvement strategies.

## RECOMMENDATIONS

The Inquiry considers the most effective long term strategy for developing the information economy is one which places primary reliance on a competitive telecommunications environment. However, government intervention will continue to be necessary to:

- ▶ encourage the development of a fully competitive market;
- ▶ encourage a more rapid introduction of competitive forces in regional, rural and remote markets;
- ▶ address fundamental quality of service issues, particularly in areas which do not yet fully enjoy the benefits of competition; and
- ▶ ensure the particular needs of disadvantaged groups are addressed.

While Government intervention will continue to be necessary, it should be incentive-based to encourage players to meet actual customer needs, rather than establish rigid service obligations.

## ENCOURAGING THE DEVELOPMENT OF COMPETITION

The Inquiry received a number of submissions that made comments on the telecommunications-related competition provisions of the *Trade Practices Act 1974*. Those provisions broadly:

- ▶ establish obligations on carriers to make available specified telecommunications services to competitors to enable those competitors to supply retail services; and
- ▶ provide mechanisms to enable the Australian Competition and Consumer Commission (ACCC) to monitor and take action against anti-competitive conduct in the telecommunications sector.

Telstra submitted that a number of regulatory measures place limits on incentives for investment and retard the development of competition in rural and regional Australia.<sup>15</sup>

Other providers argued, however, that continued or strengthened competition provisions are necessary to speed up the provision of access to Telstra's network, particularly the customer access network.<sup>16</sup> Macquarie Corporate argued for a 'service-based' competitive model, suggesting that infrastructure-based competition is likely to be inefficient in regional and rural communities. Macrocom and Cable and Wireless Optus, argued that access rights are a necessary adjunct to infrastructure competition, enabling competitors to install their own infrastructure, but connect customers to their network using the existing customer access network.

The ACCC argued that the operation of the competition provisions do not undermine investment incentives and noted that one of the objectives of the telecommunications access regime is to encourage the economically efficient use of and investment in telecommunications infrastructure.<sup>17</sup> The Government has established a comprehensive review of these regulatory provisions which is being conducted by the Productivity Commission. The Inquiry considers it important that this review of competition-related provisions have regard to the potentially significant and ongoing differences in the levels of competitive activity between urban, regional, rural and remote Australia and the consequential need for regulatory measures which reflect those differences.

The ACCC has also expressed concern that exclusive contracts for pay television programming can have the effect of limiting facilities-based telecommunications competition, particularly for regional operators. In particular, the ACCC argued that because of technical convergence, quality pay television programming is a key factor in both attracting customers to a cable network and increasing per subscriber revenue. Neighbourhood Cable, a regional carrier, expressed similar concerns.

The ACCC suggested that existing trade practices legislation does not provide an avenue for addressing these concerns and recommended a number of appropriate measures.<sup>18</sup>

*Without access to quality programming, the necessary revenue may not be available to fund cable investment. Without this investment, an important source*

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<sup>15</sup> Telstra, submission, p. 45.

<sup>16</sup> Macrocom, submission, p. 3; Macquarie Corporate Telecommunications, submission, pp. 1, 2; Cable and Wireless Optus, submission, p. 7.

<sup>17</sup> Australian Competition and Consumer Commission, submission, part 1, p. 1.

<sup>18</sup> ACCC, submission, part 2, p. 4.



*of facilities-based competition may be foreclosed from both telecommunications and pay TV markets.<sup>19</sup>*

*Without a [pay television] service to sell, the investment in the delivery infrastructure cannot be justified and the other telecommunications services supported by the network cannot be delivered.<sup>20</sup>*

Austar United Communications, another regional pay television and Internet service provider, argued that its investments could only have been possible because of the certainty provided by its programming arrangements which provide some degree of exclusivity.<sup>21</sup>

The Inquiry believes, therefore, that such complex and detailed economic and trade practices issues are relevant to the Productivity Commission's current review.

**Recommendation 1:** That the Productivity Commission's review of telecommunications-specific competition regulation have regard to the differing levels of competition across Australia and consider whether a greater recognition of those different circumstances should be incorporated into competition regulation.

**Recommendation 2:** That the Productivity Commission's review also be asked to specifically consider the implications of current pay television programming arrangements for the development of telecommunications competition in regional Australia and consider whether any additional regulatory measures are needed to facilitate access to pay television programming.

The Government's intention to introduce a level of contestability into the USO arrangements should reduce the disincentives to market entry and encourage greater innovation in product and pricing in rural and remote areas.

The Inquiry strongly supports and encourages the rapid implementation of the contestability pilots. Unlike the Extended Zone tender these pilots do not necessarily provide new entrants with any up-front assistance. The Inquiry believes that initial capital assistance can be important in enabling new operators to establish sustainable services. Such assistance can help subsidise the often high cost of equipment where low customer numbers do not enable economies of scale to be exploited.

The Inquiry would encourage the Government to consider making available additional assistance to alternative universal service providers where those providers are willing to commit to provide standard service offerings across a region which are significantly higher than the minimum required under the current USO. By providing such incentives, the Government might both facilitate service innovation and market entry and achieve real improvements to the level of service available in rural and remote Australia.

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19 ACCC, submission, part 2, p. 2.

20 Neighbourhood Cable, submission, p. 4.

21 Austar United Communications, submission, p. 3.

**Recommendation 3:** That the Government offer up-front incentives to potential alternative universal service providers in return for their commitment to supply, as a standard service, substantial improvements above the legislated minimum.

**Recommendation 4:** If the contestability processes announced by the Government do not have the effect of materially improving service levels in regional, rural and remote areas, the Government should reassess policy measures, including the USO, with a view to ensuring the contemporary telecommunications needs of all Australians are met.

In markets which have lesser levels of commercial attractiveness, it is important that governments seek to limit the potential for regulation to inhibit entry by new competitors. The Customer Service Guarantee imposes compliance costs on telecommunications providers. Those costs can be disproportionately high for new market entrants. The Inquiry considers that the competitive pressures imposed on new entrants as they attempt to provide a differentiated service (and gain market share from incumbent operators) provide adequate incentives for service improvement. Therefore, it would be appropriate to only apply the CSG to universal service providers. If a new entrant chose to become a universal service provider through the contestability arrangements, it is reasonable that they also accept the CSG arrangements.

The National Bandwidth Inquiry noted the potential for other regulatory obligations to dissuade entry into less commercially attractive markets.<sup>22</sup> The Inquiry endorses the National Bandwidth Inquiry recommendation that reviews of telecommunications-specific regulation be required to consider the impact of those obligations on the development of competition in regional, rural and remote markets.

**Recommendation 5:** That the Customer Service Guarantee be amended to apply only to universal service providers.

**Recommendation 6:** That all reviews of telecommunications-specific regulation be required to explicitly consider the impact of those regulatory mechanisms on the development of competition in regional, rural and remote Australia.

With the rapid diversification of consumer demands it is less and less likely that national operators will be able to fully address the service expectations of all consumers. New business models which focus on the specific needs of particular markets—whether they be geographic or sectoral—highlight the potential for an open market to address this diversification.

These new market models should be encouraged where they are commercially sustainable.

The Networking the Nation program and other Social Bonus initiatives are already playing a significant role in assisting regional, rural and remote communities to address their telecommunications needs. The Inquiry found that a number of factors are influential in determining the success of new market models. It is apparent that some of those factors (such as local champions) may not exist to the same extent in all rural and remote areas.

New models also need to be well supported by strong governance mechanisms and sensible risk management policies.

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<sup>22</sup> AIEAC, *National Bandwidth Inquiry*, p. xvii.

The Inquiry supports the demand-driven nature of the Networking the Nation program, but believes it is important that the government learn from the successes and failures of projects which have evolved at a community level. These lessons can both help in decisions about funding future project proposals and, more importantly, provide valuable information to enable further generations of such programs to target, and further develop, key success factors across all regions.

The Inquiry recommends continuing government support for new market models.

A model which may be useful is that provided in the United States by its Rural Telephone Bank and by the Rural Electrification Administration. These bodies provide financial and technical assistance to rural communities to improve telecommunications services.

**Recommendation 7:** That the Government refocus existing programs supporting new market models and regional communications initiatives by placing more emphasis on strategic support and advice to regions and commercially-focused funding, (such as through concessional loans or project investment).

It is clear that telecommunications is becoming integral as a delivery mechanism for a range of service sectors, most notably health, education, government services and finance. Both Commonwealth and State/Territory governments have a number of initiatives in place which are important drivers for new competition and improved regional infrastructure.

The Inquiry does not consider supply side mechanisms, such as the USO or other service obligations, to be the most effective means of addressing the needs of key users such as health and education. Not only are the needs of these sectors complex and different from any ‘universal’ requirement, but they are very significant purchasers with a capacity to have their needs commercially met.

Further, the role of telecommunications in their broader activities should be determined by those sectors. This point has been recognised by the American Alliance for Public Technology, in its statement of universal access principles:

*The migration of voice-grade services to a fully interactive multimedia concept of universal service requires focus on developing community-based applications of new technologies. These applications can ... become a significant driver of private investment in developing and deploying the nation's public telecommunications infrastructure.*

*Even though development of community-based applications are essential to market building, the telecommunications industry cannot be expected to assume the full burden of funding of these applications. Aggregating demand requires that telecommunications policies be integrated with other public policies that can provide the basic financing for such applications ... As the applications of new communications technologies are developed, they need to be integrated into the budgets of schools, libraries, health care systems, labor market operations and a wide variety of government services.<sup>23</sup>*

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<sup>23</sup> Alliance for Public Technology, *Connecting Each to All: Principles to Implement the Goal of Advanced Universal Service*, [www.appt.org/publica/universal.html](http://www.appt.org/publica/universal.html).

However, the Inquiry found some concern in rural and remote areas that state or nationwide service arrangements for these key sectors can substantially limit the potential to develop regionally-based demand aggregation projects. This is particularly the case where government telecommunications demand represents a significant proportion of total telecommunications demand in a region. There appears to be an inherent tension between sectorally-driven and regionally-driven telecommunications strategies. Consideration should be given to mechanisms which can reduce or eliminate the impact of these sectoral or government-wide purchasing models on regional strategies.

**Recommendation 8:** That the Government establish a national communications fund to assist significant communications projects by key users such as education or health. A core criterion for funding such projects should be the extent to which they will also improve communications services generally available to surrounding regional, rural and remote communities.

An informed market is vital for competition to flourish.

Regulators overseas have also recognised the importance of an informed and sophisticated consumer base.<sup>24</sup> The Inquiry found that awareness levels of service options, particularly regarding advanced services, appears low and that it is incumbent on the industry as a whole to improve its efforts in informing the market about those services. Competitive pressures are likely to assist this process.

In regard to quality of service comparisons, the Inquiry is conscious that regulated service standards—particularly in highly competitive or still evolving markets—can have the effect of limiting innovation and preventing consumers from making informed price-quality trade-offs. The Inquiry does not, therefore, propose mandating service quality requirements. Rather, it proposes that common quality indicators be established to enable consumers to compare service options in an informed way.

**Recommendation 9:** That the ACA establish standard quality of service indicators to be adopted by all major service providers. Those providers should be required to publish their performance against those indicators on a regular basis.

## ADDRESSING FUNDAMENTAL QUALITY OF SERVICE ISSUES

While the recommendations above are directed at facilitating and speeding up the development of a competitive market place, it must be recognised that there are immediate service-related issues that need to be addressed, particularly in rural and remote areas. Regulatory oversight and, where necessary, intervention is an appropriate tool to address these areas of concern where competition has not yet had a significant effect. However, the Inquiry considers that quality of service regulatory obligations should be removed where it can be demonstrated that competitive pressures are operating effectively.

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<sup>24</sup> Ofcom, *Towards Better Telecoms for Consumers – May 2000 Progress Report*, [www.ofcom.gov.uk](http://www.ofcom.gov.uk).

The Inquiry found high levels of frustration among many consumers (largely in rural and remote areas) regarding the reliability of their basic telephone service. While quality of service information collected by this Inquiry from the ACA and Telstra suggests that fault rates are improving, data indicates Telstra's network in many areas suffers faults well above best practice. This appears confirmed by evidence to the Inquiry of fault rates and recurring problems in many areas.

It appears that the ACA's quality of service monitoring mechanisms do not focus adequately on fault occurrence or disaggregate performance at a low enough level to identify localised problems.

An improved focus on quality of service monitoring could be achieved by establishing a dedicated position on the ACA to have responsibility for quality of service issues, particularly in regional, rural and remote areas.

**Recommendation 10:** That a member of the Australian Communications Authority be appointed to be responsible for the Authority's activities in monitoring and investigating quality of service issues. This member should have particular regard to regional, rural and remote issues.

**Recommendation 11:** That the Australian Communications Authority be required to monitor fault rates in any Universal Service Provider's network at a highly disaggregated level (at least at 'distribution area' level in Telstra's network) to identify reliability problems. The ACA should be empowered to direct a universal service provider to take specific action to address identified reliability issues.

The Inquiry has also heard evidence of isolated circumstances where a provider's failure to meet Customer Service Guarantee standards has been extreme. These cases cause significant hardship for the individual customers involved. While existing monitoring arrangements provide the regulator and community with some understanding of overall performance, there is a role for the regulator to investigate the circumstances which surround extreme performance failures. The ACA's existing powers to direct telecommunications providers in regard to their compliance with the CSG would also enable it to act in cases where a systemic problem is identified.

**Recommendation 12:** That the Australian Communications Authority identify and investigate extreme cases of failure by providers to meet CSG timeframes.

A number of submissions to the Inquiry questioned the appropriateness of existing Customer Service Guarantee standards. These comments appear to be based on two key claims. First, the suggestion that the existing standards have their foundation more in historic Telstra (or Telecom) performance targets than in an objective assessment of what service performance is reasonable across different parts of Australia. Secondly, that technological developments have advanced such that quantum improvements in performance are possible.

The Inquiry was not in a position to undertake the substantial investigation necessary to determine the appropriateness of the existing CSG standards in today's environment. The Inquiry notes, however, that:

- ▶ the ACA is undertaking research into developing a methodology which will enable the costs and benefits of service improvement to be more objectively determined. This will assist in any further review of the standards;
- ▶ with the introduction of new technologies, there is the potential for service standards to be improved—although in an environment of multiple delivery platforms it is unlikely that any single service standard would be appropriate across all providers; and
- ▶ a source of much frustration regarding service connections relates to circumstances in which Telstra provides a verbal commitment to consumers that a connection will be made within the CSG timeframe, only to advise at a later point that no infrastructure is available and a new connection date (based on the CSG timeframe where no infrastructure is available) is given.

With the prospect of significant customer access network competition, the implications of different technology platforms and provider capabilities will need to be considered in the context of future revisions to the CSG. If the Government were to adopt our Recommendation 5 above, that the CSG apply only to a universal service provider, the potential distortions may be alleviated.

**Recommendation 13:** The Australian Communications Authority should be requested to review the operation of the CSG in a multicarrier/multiplatform environment to determine whether existing common standards remain appropriate. In particular, the standards applying in circumstances where no infrastructure is readily available should be reviewed to ensure the sources of consumer frustration are reduced and appropriate incentives are in place to encourage effective capacity planning.

## ADDRESSING SPECIAL NEEDS

Funding for consumer representation is available through the Commonwealth, but a lack of ongoing resources for groups representing people with disabilities may limit their ability to effectively participate in future industry processes regarding equipment design and standards. There is also a low level of awareness by the disabled community of the availability and use of special needs equipment. Additional funding should be provided to address these current deficiencies through existing grants programs.

Consumers with life-threatening medical conditions and other emergency or priority situations clearly need special consideration in terms of restoration of service. The Inquiry found little understanding of how to get priority status and little readily accessible information available to consumers about either the process or the eligibility criteria for gaining priority consideration. While commercial service assurance packages are available to businesses, individual consumers will tend to rely on the advice they receive when seeking emergency repair assistance.

**Recommendation 14:** That funding for representation of consumers be extended beyond the current budget allocation, and consideration given to providing funding on a longer term basis than the existing annual cycle to ensure greater stability for consumer organisations. Provision should also be made for additional resources to assist people with disabilities participate in industry processes and conduct awareness raising activities.

**Recommendation 15:** That carriers improve the level of information they make available to the public about emergency and health related priority services; the ability of customer service staff to advise customers on obtaining priority status; and the availability of relevant criteria for gaining priority.

Many people with disabilities lack the awareness or training to make use of available equipment or services. In particular, this appears to be the case for hearing and speech impaired communications users in relation to TTY machines. The National Relay Service provides a valuable resource for reducing the communication barriers for speech and hearing impaired consumers and there is some limited training currently provided under that program. The Inquiry believes, however, that better access could be achieved if specific provision was made for training.

**Recommendation 16:** That a training program for users of TTY machines be incorporated into the National Relay Service (NRS).

The communications requirements of remote Indigenous communities warrant particular attention. The Inquiry is aware of Telstra's intention to employ and train people within those communities to undertake basic repair and maintenance activities. These communities are characterised by isolation, distinct income and employment profiles and unique cultural considerations which influence their telecommunications requirements. It is apparent that the USO does not adequately reflect the telecommunications issues that exist in remote Indigenous communities. The Inquiry was advised by the Aboriginal and Torres Strait Islander Commission that some remote communities have 'cashed out' their benefits from other generally available government services, such as Medicare, to enable the community to develop solutions which address their particular needs and circumstances.<sup>25</sup> Consideration should be given to this possibility for telecommunications services.

The Inquiry acknowledges that such an adjustment to communications service provision in remote Indigenous communities may have some implications for the implementation of the tender arrangements for the extended local call zone tender.

The Inquiry also recognises that significant improvements to existing services in remote Indigenous communities will require funds in excess of the effective subsidy flowing to those communities today through the USO.

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<sup>25</sup> ATSIIC – Inquiry communication.

**Recommendation 17:** That consideration be given to establishing a scheme to source basic and advanced communications services for remote Indigenous communities. The scheme should be firmly driven by the identified communications needs of these communities. The scheme could be funded with an initial capital injection from Government and benefit from ongoing supplementation based on the estimated proportion of the net universal service cost currently attributable to such communities.

The Inquiry urges the Government to give priority to the above recommendations so that all Australians—wherever they may live or work—will have access to adequate telecommunications services in the shortest, practicable time.

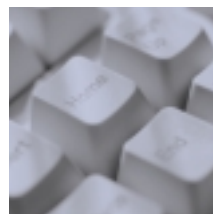
The Inquiry is confident that adoption of these recommendations, combined with existing commercial developments and government initiatives, are appropriate measures for a rapidly changing and dynamic telecommunications sector.

The Inquiry also urges the Government to continue to provide financial and strategic assistance to ensure that those currently disadvantaged—especially in regional, rural and remote Australia—are able to take their place in an information society.





# APPENDICES



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# APPENDIX A—CONDUCT OF INQUIRY

## INTRODUCTION

The Terms of Reference required the Inquiry to consult widely with stakeholders and to seek input from the public in metropolitan, regional, rural and remote Australia.

The Inquiry sought submissions from the public, industry and user groups through 120 newspaper advertisements placed nationally—in metropolitan and regional newspapers, as well as the rural and Indigenous press.

Metropolitan, regional, remote and special-interest print and electronic media outlets nationally were issued ten media releases prior to the 31 May 2000 submission closing date. Media releases called for submissions, identified the closing date for submissions, provided details of the Inquiry's processes including where to access publicly available information, as well as inviting the media and public to observe the roundtable meetings. A total of 15 media releases were issued during the Inquiry.

A number of media interviews were undertaken by panel members. From the announcement of the Inquiry by Senator Alston to the submission closing date of 31 May 2000, more than 220 metropolitan and 250 regional reports on the Inquiry appeared in the electronic and print media nationally.

A wide direct mail campaign to individuals, organisations and industry inviting submissions was completed during the week commencing 10 April 2000. The Inquiry wrote to a total of 500 organisations including:

- ▶ all licensed telecommunications carriers
- ▶ 113 larger carriage service providers (including Internet service providers) and equipment manufacturers
- ▶ all Federal MPs and Senators
- ▶ 45 regional development boards
- ▶ the national and each State and Territory Local Government Association
- ▶ all State and Territory Online Council Ministers
- ▶ 23 organisations representing consumer, community or industry groups (e.g. the Aboriginal and Torres Strait Islander Commission, the Australian Association of the Deaf, the Australian Consumers' Association, the Australian Council of Social Services, the Consumers' Telecommunications Network, the Internet Society of Australia)
- ▶ the Australian Communications Authority, the Australian Competition and Consumer Commission and the Telecommunications Industry Ombudsman.

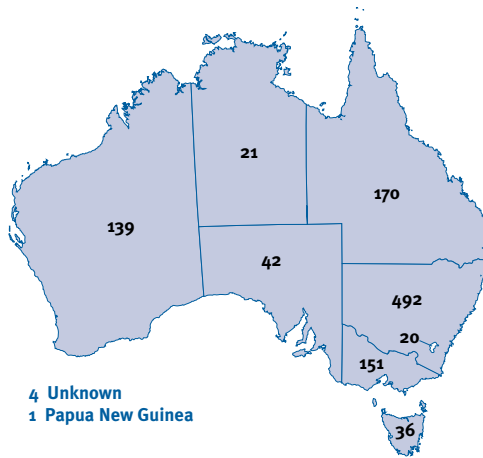
To assist people to gain information about the Inquiry and the consultation process, a freecall 1800 telephone number and a dedicated website were established.

# SUBMISSIONS

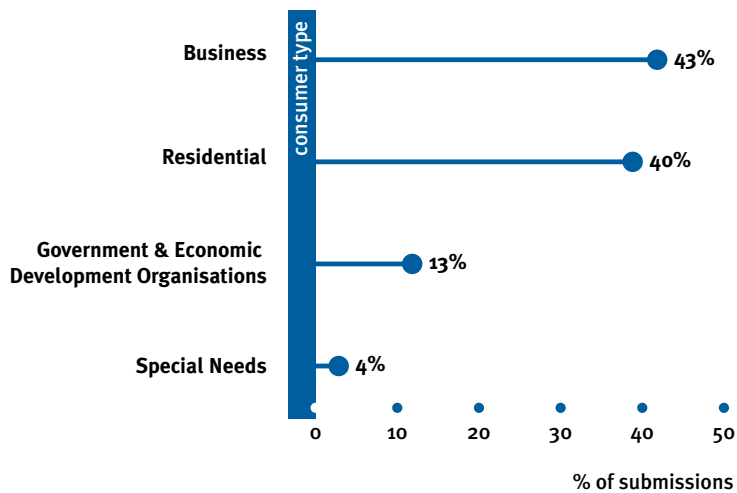
At the end of this Appendix is a list of individuals and organisations which made submissions to the Inquiry. A total of 1076 submissions were received, 25 from carriers and carriage service providers and 1051 from end users. Included in the total are a number of submitters who sought confidentiality. Those submissions have not been identified in the published list.

The list of submissions should also be read bearing in mind that it was sometimes difficult to discern the exact spelling of names. The Inquiry regrets any inaccuracies or omissions which may have arisen as a result.

**FIGURE A.1: NUMBER OF SUBMISSIONS BY STATE OR TERRITORY**

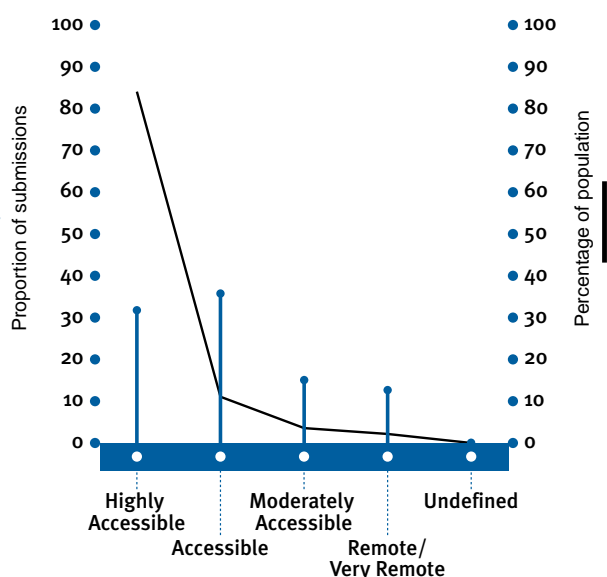


**FIGURE A.2: SUBMISSIONS FROM CONSUMERS OR THEIR REPRESENTATIVES**



The Inquiry received 1051 submissions discussing telecommunications from a consumer’s viewpoint. A submission was classified as either business, residential, government and economic development organisation or special needs. The business category includes businesses and non-profit organisations that represent the opinions of business. Farmers were also deemed to be business, despite many discussing the effects of telecommunications on lifestyle. The residential category consists of individuals and advocates of residential interests. The government and economic development organisations category covers three tiers of government, government agencies, political parties, emergency services, regional and economic development organisations, hospitals and education organisations. Special needs includes submissions from individuals and groups representing people with disabilities, Indigenous communities, and people with low incomes.

**FIGURE A.3: REGIONAL DISTRIBUTION OF SUBMISSIONS RECEIVED**



The location of submissions was analysed using the Accessibility/Remoteness Index of Australia (ARIA)<sup>1</sup>. The Index analyses locations by reference to their accumulative distance to other towns or cities in Australia and the availability of services in that location. They are then classified in broad groups:

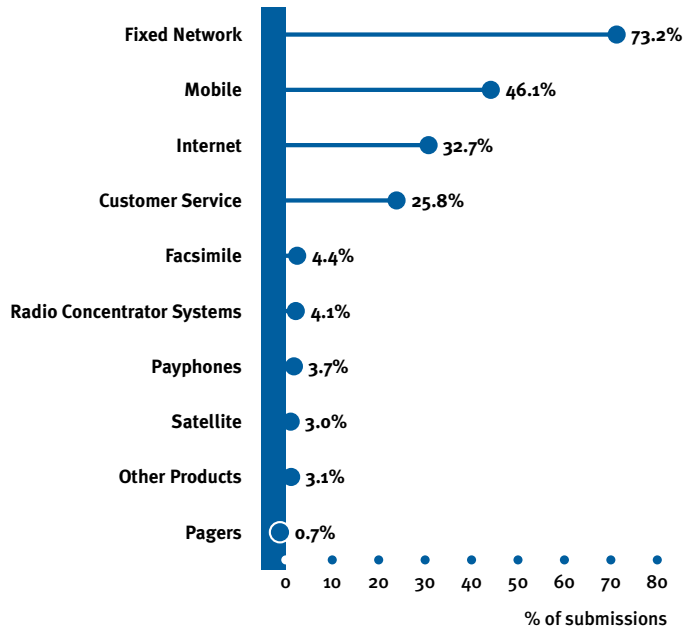
- Highly Accessible = ARIA score 0 – 1.84
- Accessible = ARIA score >1.84 – 3.51
- Moderately Accessible = ARIA score >3.51 – 5.80
- Remote and Very Remote = ARIA score >5.90 – 12

<sup>1</sup> Department of Health and Aged Care, and the National Key Centre for Social Applications of Geographic Information Systems at the University of Adelaide, *Measuring Remoteness: Accessibility/Remoteness Index of Australia (ARIA)*, Occasional Papers Series, New Series No. 6.

It would be reasonable to assume that Highly Accessible is broadly equivalent to metropolitan, Accessible is equivalent to regional, Moderately Accessible is equivalent to rural, and Remote/Very Remote is equivalent to remote.

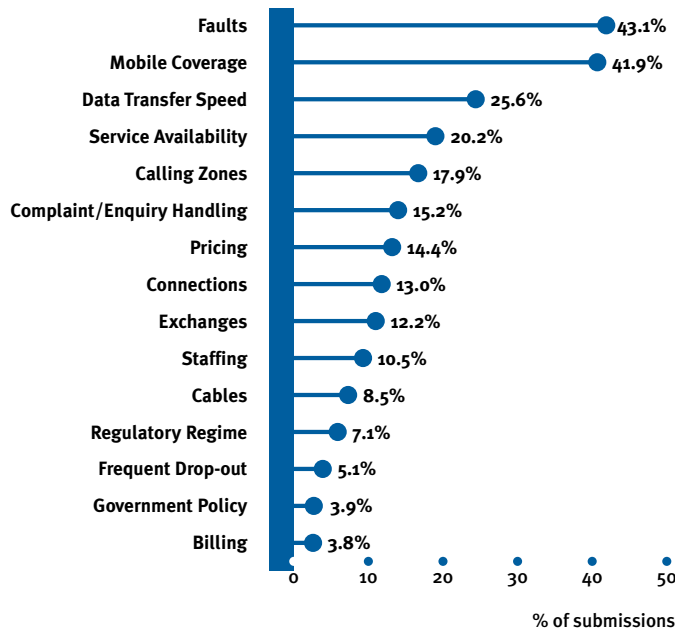
Regional and metropolitan areas accounted for the majority of submissions. However, using a comparison with populations in each of the geographic categories, it is apparent that people from rural and remote areas were the most active participants in the Inquiry submission process.

**FIGURE A.4: TELECOMMUNICATIONS SERVICES RAISED IN SUBMISSIONS**



Each comment from a consumer submission was categorised according to the type of service and issue. A submission typically had a number of comments, which may be positive, neutral or negative. Not surprisingly, most comments were negative, although some submissions reflected positively on some aspects of telecommunications. The majority of comments related to the fixed network. Radio concentrator systems and satellite refers to the telecommunication technologies used in remote areas. The other products category typically refers to special products for minority groups that did not relate to one specific service type.

**FIGURE A.5: TELECOMMUNICATIONS ISSUES RAISED IN SUBMISSIONS**



Faults and mobile coverage were the issues that received most comments, with both present in over 40 per cent of consumer submissions. Availability of service incorporates comments regarding the availability of the Internet, payphones, or special services/products. The exchanges category deals primarily with the inability of the local exchange to handle services such as call waiting and caller identification. Frequent dropout is concerned with the disconnection of service for Internet, fixed network, and facsimile usage.

## FIELD TRIPS

The Inquiry commenced the first of four field trips on 5 June 2000 with subsequent trips occurring during June and July. The field trips allowed the Inquiry to gather further information on issues pertaining to its terms of reference. The trips also provided an opportunity to hear first hand the issues individuals and organisations believe the Inquiry should take into account when drawing its conclusions for the Report. Over the four weeks the Inquiry visited all States and the Northern Territory, covering as wide a range of metropolitan, regional, rural and remote areas as possible.

The field trips were part of the consultative process designed to listen to the issues raised by individuals and organisations who had made submissions. A roundtable style of meeting was adopted with a cross-section of those who had made a submission to the Inquiry invited to participate. Interested members of the public were welcome to observe the proceedings. Transcripts of all roundtable meetings are available on the Inquiry's website.

Statewide video conferences were used during the field trips to hear the views of some of the people who were unable to attend the roundtables in person.

**FIGURE A.6: LOCATION OF ROUNDTABLE MEETINGS**





## PARTICIPANTS AT ROUNDTABLE MEETINGS

Location and date	Participant
<b>Melbourne</b> 5 June 2000	<p>Multimedia Victoria, Department of State and Regional Development Bronte Adams, Executive Director Martin Doddrell, Manager, Regional Access</p> <p>Communication Aids User Society Jan Ashford</p> <p>Combined Pensioners &amp; Superannuants Association also CTN member Irene Short, Assistant State Secretary</p> <p>Australian Telecommunications Users Group (ATUG) Alan Horsley, Managing Director</p> <p>National Farmers' Federation Mark Needham, Consultant, Telecommunications Policy</p> <p>Victorian Farmers' Federation Peter Walsh, President Marie O'Dea, Senior Policy Analyst</p> <p>Centre for International Research on Communication and Information Technology (CIRCIT) John Murphy, Research Associate Ross Kelso, Senior Research Fellow</p> <p>Communications, Electrical, Plumbing Union (CEPU) Rosalind Eason, Senior National Industrial Research Officer, Communications Colin Cooper, Divisional President, Communications Kevin Beck</p> <p>Ericsson Australia Bruce Matheson, General Manager, Regional and Rural Solutions Anthony Coyle, Solutions Manager</p>
<b>Albany</b> 6 June 2000	<p>Great Southern Development Commission Mark Pitts-Hill, Development Officer</p> <p>Southern Province Projects Group John Simpson also Chairman, Great Southern Development Commission Bruce Manning, Executive Officer</p> <p>Shire of Gnowangerup Jan Savage, President</p> <p>Mt Barker Primary School Neil Warburton, Deputy Principal</p> <p>Disability Services Commission Gabrielle Rose, Local Area Coordinator</p>

Location and date	Participant
<b>Albany</b> <i>continued...</i>	<p>Albany Chamber of Commerce and Industry  Jeff Cloughton, Executive Member  also Chairman, Albany Accountants' Association</p> <p>Tambellup Telecentre  Tony Duffield, Manager</p> <p>Southern Telecentres  Debbie Rice, Regional Coordinator</p> <p>Irene Bunn</p> <p>Vital Food  Michael Pemberton, Manager  also President, Chamber of Commerce and Industry</p>
<b>Kalgoorlie</b> 6 June 2000	<p>Kalgoorlie Regional Hospital  John Fielding</p> <p>Shire of Menzies  Greg Carter, CEO</p> <p>City of Kalgoorlie-Boulder  Roger Hayes, Manager Information and Technology</p> <p>Goldfields District Education Office  Neil Darby, District Director</p> <p>Goldfields-Esperance Development Commission  including members of the Goldfields-Esperance Communications  Working Party  Ray Cianciar, Deputy CEO  Peter Durrant, Chairman  Annemie McAulliffe</p> <p>Shire of Coolgardie  Sandra Trenowden, President</p> <p>Ian Longmire</p> <p>Ron Yuryevicj</p>
<b>Perth</b> 7 June 2000	<p>Department of Commerce and Trade  Chris Fitzhardinge, Executive Director, Regional Development</p> <p>Office of Information and Communications  Philip Skelton, Team Leader, Telecommunications</p> <p>Western Australia Telecentre Network  Brett Sabian, Director</p> <p>Royal Flying Doctor Service  Steve Lansell, Aviation and Communications Manager</p>

Location and date	Participant
<b>Perth</b> <i>continued...</i>	<p>Ethnic Communities Council of WA Nick Agocs, Board Member</p> <p>Western Australian Farmers Federation Frank Camarri, Chairman of Farm Business Committee</p> <p>Pastoralists and Graziers Association of WA Eric Broad, Executive Member Ron Connors, Policy Director, Economics and Business Management</p> <p>iiNet and iiTel Kimberley Heitman, Legal Manager</p> <p>Creating and Sustaining Online Communities Association Jackie Gill, Convenor</p> <p>Australian Telecommunications User Group (WA) Dr Walter Green, Director, Communications Experts Group</p>
<b>Port Hedland</b> 8 June 2000	<p>Pilbara Development Commission Robyn Crane, Acting Chief Executive Officer Dennis Martin, Coordinator Strategic Infrastructure Planning</p> <p>Eastern Pilbara College of TAFE Kyle Hargreaves, Manager – Information Systems</p> <p>Town of Port Hedland Tony Ford, CEO</p> <p>Aboriginal and Torres Strait Islander Commission (ATSIC) Adrian Brahim, Regional Chairman</p> <p>Town of Port Hedland Bob Neville, Councillor also Manager, Bloodwood Tree Association</p> <p>Irrungadji Aboriginal Group Geoff Bushby, Coordinator</p> <p>Isolated Children’s Parents’ Association Anne Copin, Communications Portfolio</p> <p>Fire and Emergency Services Authority of WA Peter Cann, Regional Director</p> <p>Pastoralists and Graziers of WA Carey Paterson</p> <p>Northern Regional Police Command Ivan Davie, Senior Sergeant</p>

<b>Location and date</b>	<b>Participant</b>
<b>Sydney</b> 9 June 2000	Office of Information Technology Robert Wheeler, Executive Director John Simon, Manager Telecommunications  NSW Fire Brigade Roger Doyle  Department of Education and Training John Banham, Chief Information Officer  Australian Council of Social Services (ACOSS) Chris Dodds, Board Member  Consumers' Telecommunications Network (CTN) Helen Campbell, Executive Officer Theresa Corbin  Telecommunications Industry Ombudsman (TIO) John Pinnock, Ombudsman  Deafness Council of NSW Peter Kerley  Baptist Rural Support Services David Jones  Small Enterprise Telecommunications Centre Limited (SETEL) Ewan Brown, Executive Director  Parramatta City Chamber of Commerce and Industry Inc David Osborne  NSW Farmers' Association Mal Peters, Chairman – Rural Affairs Committee Dee Wilkes-Bows, Director – Rural Affairs
<b>Western Australian statewide videoconference</b> 7 June 2000	Jarlmadangah Aboriginal Corporation Joe Grande  Megan O'Donnell  Colin Stewart  Central West College of TAFE, Geraldton Martyn Edwards and Wayne Collyen  NE Wheatbelt Regional Organisation of Councils Stuart Hobley  Shire of Mount Marshall Ken Donohoe

Location and date	Participant
<b>Brisbane</b> 19 June 2000	<p>Department of Communications, Information, Local Government and Planning Michael Cook, General Manager, Communications and Information Services</p> <p>Local Government Association of Queensland Steve Greenwood, Manager, Planning and Social Policy</p> <p>Telecommunications and Disability Consumer Representation (TEDICORE) Gunela Astbrink, Policy Officer</p> <p>Australian Communication Exchange Bobbie Blackson, Executive Officer, Community Services Division</p> <p>Australian Telecommunications User Group David Hudson, Deputy Convenor</p> <p>AgForce Paul Bidwell, General Manager, Policy</p> <p>Communications, Electrical, Plumbing Union, Queensland Branch Ian McLean, Division Branch Secretary Telecommunications and Services Branch</p> <p>Queensland Commercial Fishermen's Organisation Tricia Kelman</p> <p>Garry Ford</p> <p>Marie Ward</p>
<b>Moree</b> 19 June 2000	<p>Moree Plains Shire Council Mike Montgomery, Mayor</p> <p>New England-North West Regional Development Board Mike Montgomery, Chairman</p> <p>Northern Area Regional Organisation of Councils Richard Colless, Chairman (also Mayor, Inverell Shire Council)</p> <p>Inverell Shire Council Joerg Liermann, Secretary Management Executive Officer</p> <p>Rural Development Centre, University of New England Ros Foskey, Project Officer</p> <p>Australian Quadriplegics Association Greg Gambetta</p> <p>Farmer, Bingara Steve Adams</p> <p>Farmer/Agronomist, Moree Dallas Parsons</p> <p>Farmer, Gravesend Sue Barwick</p>

<b>Location and date</b>	<b>Participant</b>
<b>Roma</b> 20 June 2000	<p>South West Strategy Group Lachlan Pegler, A/g Manager</p> <p>Royal Flying Doctor Service Graeme Woiwod</p> <p>Charleville School of Distance Education Karen Reithmuller, A/g Principal</p> <p>AgForce Larry Acton, President</p> <p>Queensland Chamber of Commerce and Industry Ken Murphy, Regional Chairman for South-West Queensland</p> <p>GrowZone Development Network Garry Hansford, Project Manager, GrowZone Online Project Phillip Gersekowski , Technical Manager, GrowZone Online Project</p>
<b>Longreach</b> 20 June 2000	<p>Barcardine Shire Council and Aramac Shire Council John Landers</p> <p>Queensland Rural Women’s Network Chris Capel, Member QRWN Technology Committee</p> <p>Longreach Shire Council Bob O’Brien, CEO</p> <p>Lindsay McDonald</p> <p>Central Western Queensland Remote Area Planning and Development Board Lawrie Cremin, CEO</p>
<b>Mackay</b> 21 June 2000	<p>Mackay Tourism and Development Bureau Wayne Spenser, CEO Gary Ormon, NTN Program Manager</p> <p>Queensland Chamber of Commerce and Industry Craig Joy</p> <p>Canegrowers Ron Mullins, CEO Jim Pedersen, Mackay District Chairman Ted Bussey, Marian Area Committee Chairman</p> <p>Stallion Networking – Australia Jonathon Eastgate</p> <p>Mackay Children’s Support Programs Vivienne Dwyer</p> <p>Peter Howard</p> <p>Peter and Leigh Fordyce</p> <p>Paul Cassels</p>

<b>Location and date</b>	<b>Participant</b>
<b>Cooktown</b> 21 June 2000	<p>Cape York Peninsula Development Association Bob Sullivan, President</p> <p>Balkanu Cape York Development Corporation Daniel Grainger, Project Manager, Cape York Digital Network</p> <p>Cook Shire Council Ross Logan Bill Jackson</p> <p>Cooktown and District Family Resource Centre Anne Meehan, Co-ordinator</p> <p>Cooktown Community Website Clive Pratt, Site Manager John Shey</p> <p>Patricia Hanush</p> <p>Cooktown State School Laurie Shepherd, Principal</p>
<b>Mt Isa</b> 22 June 2000	<p>Mount Isa—Townsville Economic Zone Darcy Redman, Executive Director</p> <p>Mt Isa Chamber of Commerce John Thinne, President</p> <p>Boulia Shire Council Chris Blanch, Chief Executive Officer</p> <p>North-West Development Initiative Bob McDonald, Chair, Rural Issues Group</p> <p>Mt Isa School of the Air Karin Redman, Principal</p> <p>Isolated Children's Parent's Association Margaret Greenway, Former Past President</p> <p>State Member for Mt Isa Siri Grabski, Adviser to Tony McGrady MP</p> <p>Mt Isa City Council Doug Hayward, Manager, Economic Development Fay Donovan, Deputy Mayor</p> <p>Donald McDonald</p>

<b>Location and date</b>	<b>Participant</b>
<b>Queensland statewide videoconference</b> 23 June 2000	<p>Brian Lamprell</p> <p>Lorraine McGinnis</p> <p>Mistake Creek Area Progress Association Sally Goodwin and Carl Moller</p> <p>Kinnoul Group Ian Lethbridge and Paul Wright</p> <p>Barry Slack</p> <p>Bucknell Enterprises Colin Bucknell</p>
<b>Darwin</b> 3 July 2000	<p>Office of Communications, Science and Advanced Technology Jeremy Watson, Principal Policy Manager</p> <p>Territory Health Services Paul Gooding, A/g Director, Information Technology</p> <p>Police Force of the Northern Territory Superintendent Mark Jeffs, Command Support Officer, Berrimah Police Headquarters</p> <p>Northern Territory Library and Information Service Lea Giles-Peters, Director</p> <p>Local Government Association of the Northern Territory Libby Lyons, Manager, IT Projects</p> <p>Office of Aboriginal Development, Northern Territory Government John Gardiner, Acting Director (Projects)</p> <p>Nicky Grice</p> <p>Peter Clee</p>
<b>Kununurra</b> 3 July 2000	<p>Kimberley Development Commission Jeff Gooding, CEO</p> <p>Shire of Wyndham East Kimberley Tony Brown, CEO</p> <p>William Withers</p>



<b>Location and date</b>	<b>Participant</b>
<b>Alice Springs</b> 4 July 2000	<p>Urapuntja Health Service Greta Small</p> <p>Alice Springs School of the Air Tony Richards, Project Manager Derek Thomas, Senior Teacher</p> <p>Aboriginal and Torres Strait Islander Commission (ATSIC), Alice Springs Regional Office Mark Walker, A/g Regional Manager</p> <p>Northern Territory Cattlemen's Association Bob Lee, CEO</p>
<b>Adelaide</b> 5 July 2000	<p>Information Economy Policy Office Robert Martin, Executive Director Alan Cunningham, Deputy Director</p> <p>Brentwood community Julie Searle, Community Representative Robert Searle, Country Fire Service Captain</p> <p>Wakefield Regional Council Philip Barry, CEO</p> <p>Outback Areas Community Development Trust Leith Yelland, Project Officer</p> <p>South Australian Farmers Federation Jon Court, Policy Development Officer Richard Way, Chair, Community Services Committee</p> <p>Federal Member for Grey Barry Wakelin MP</p> <p>Ortwin Jansen, Management Consultant Nigel Brand</p>
<b>South Australian statewide videoconference</b> 5 July 2000	<p>Commodore Station Patricia Wiseman</p> <p>Jeff Ottens</p> <p>Richard Sawday</p> <p>Mark Taplin</p> <p>John Gaden</p>

<b>Location and date</b>	<b>Participant</b>
<b>Broken Hill</b> 6 July 2000	<p>Outback Regional Development Organisation and Outback Telecentre Network Michael Verwey, Executive Director and Regional Network Manager</p> <p>Broken Hill City Council Jim Leary, Corporate Services Director</p> <p>Federal Member for Parkes Tony Lawler, MP</p> <p>Broken Hill Chamber of Commerce Sharon Hocking, Vice-President</p> <p>Australian Inland Energy Linda Heane, Manager Corporate Chris Forrest, Manager IT</p> <p>Royal Flying Doctor Service (South Eastern Section) Gary Oldman, Information Technology Manager</p> <p>Rob Seekamp</p>
<b>Western New South Wales videoconference</b> 6 July 2000	<p>Bourke Shire Council Alan Varley, General Manager</p> <p>Wayne O'Mally</p> <p>Julie Cullenward</p> <p>Walgett Aboriginal Medical Service Christine Thorne, CEO</p> <p>Louise Foster</p> <p>Western Division Group of the Shires Association of NSW Jenny McLellan, President</p>
<b>Port Lincoln</b> 7 July 2000	<p>Eyre Regional Development Board Heather Robin, Development Manager</p> <p>District Council of Elliston David Hitchcock, CEO</p> <p>Eyre Peninsula Local Government Association Vance Thomas, Executive Officer</p> <p>Spencer Institute of TAFE Anna Papazoglov, Education Manager</p> <p>Eyre District Office of the Department of Education, Training and Employment Veronica Conley, District Coordinator</p> <p>David Jericho</p>

<b>Location and date</b>	<b>Participant</b>
<b>Port Lincoln</b> <i>continued...</i>	<p>Wudinna and District's Telecentre Eleanor Scholz</p> <p>Isolated Children's Parents' Association of South Australia Robin Dawson</p> <p>State Member for Flinders Maxine Grieve, Personal Assistant representing Liz Penfold, MP</p> <p>Cynthia Agars</p>
<b>Grafton</b> 24 July 2000	<p>Australia's Holiday Coast Development Board Bill Calcutt</p> <p>Norlink Lynne De Weaver, Project Officer</p> <p>Clarence Regional Library Richard Nichols, Regional Librarian</p> <p>Northern Rivers IT Glen Schaefer, Manager</p> <p>Southern Cross University Janet Scharbow, Infrastructure Manager also Board Member, Norlink</p> <p>Nornet Gerard Criss, Managing Director</p> <p>Guyra Shire Council Geoff Brooks, General Manager</p> <p>Northern Rivers Health Service Gary Alcock, Telecommunications Officer</p> <p>Catholic Education Centre Peter Corless</p>
<b>Dubbo</b> 25 July 2000	<p>Central West Regional Development Board Paul Forbes, Community Development Officer, IT&amp;T</p> <p>Federal Member for Calare Peter Andren, MP Tim Payne, Senior Adviser</p> <p>Cabonne Council Bill Barber</p> <p>Dubbo City Council Gerry Peacocke, Mayor Warwick Burke, Manager – Information Technology</p> <p>Dubbo Chamber of Commerce Joe Knagge, President</p>

<b>Location and date</b>	<b>Participant</b>
<b>Dubbo</b> <i>continued...</i>	<p>Australian Council for the Rehabilitation of Disabilities (ACROD) Vicki Aurisch, Secretary, Western Region</p> <p>Connie Eales</p> <p>Raymond Morgan</p> <p>Kate Symonds and Goldie Ridley</p>
<b>Wagga Wagga</b> 25 July 2000	<p>Riverina Regional Development Sharonne Moore, Telecommunications Coordinator Katrina Tehan, Western Riverina Project Officer</p> <p>Tumbarumba Shire Council Mauro Dei Agnolli, Director, Technical Services Ian Chaffey Jeff Sowiak</p> <p>Narrandera Shire Council Des Edwards, Mayor Bob Manning Ken Murphy, General Manager</p> <p>Crookwell Shire Council Bob Wilkinson, General Manager</p> <p>Hume Shire Council Gary Arnold</p> <p>Heartland Communications Doug Miell, Manager – Regional Sales and Marketing</p> <p>Australian Seafood Industry Council Trogan Fisheries Dennis Brown, Spokesperson, Marine Telephony Commercial Fisher, Owner</p> <p>Anne &amp; Laurie Martin</p> <p>Michael Murray</p> <p>Michael Tonner</p>
<b>Wangaratta</b> 26 July 2000	<p>Delatite Shire Council Peter Bascomb, Director of Administrative and Community Services</p> <p>Rural City of Wangaratta Paul Comensoli, Development Manager</p> <p>Federal Member for Murray Sharman Stone MP</p> <p>Goulburn Valley Regional Library Corporation and MurrayLink Libraries Susan Liepa</p> <p>John Sykes</p>

<b>Location and date</b>	<b>Participant</b>
<b>Wangaratta</b> <i>continued...</i>	J Schulz Lance Gawley NETCoop Peter Jamieson, Executive Officer Peter Twomey Ted Hatty Kevin Balaam
<b>Ballarat</b> 26 July 2000	Regional Connectivity Project Peter Ziebell, Coordinator  The Grampians Information, Information Technology & Telecommunications Alliance of Rural Hospitals Paul Mannix, Chief Information Officer  Ballarat City Council Gary Purton, Economic Development Office  Rural City of Ararat Ivan Surridge, Manager, Economic Development  Ballarat Chamber of Commerce Tim Roberts, Vice-President  Neighborhood Cable Craig Freeman, Technical Director  CAS Netlink (Cyberlink) Gary Smith, Manager  Peter Collins  Viesha Lewand  Joan Chambers  Angela Turner and Claire Turner  Golden Plains Shire David Madden, Director Technical Operations
<b>Hamilton</b> 27 July 2000	Federal Member for Wannon David Hawker MP  Greater Green Triangle Region Association Michael Whitehead, Executive Officer  Kate Joseph  Wartook Gardens Bed and Breakfast and Grampians-Wartook Promotion Group Royce and Jeanne Raleigh

<b>Location and date</b>	<b>Participant</b>
<b>Hamilton</b> <i>continued...</i>	David Smith James Owens-Brownbill George Belfield
<b>Devonport</b> 28 July 2000	Federal Member for Braddon Sid Sidebottom MP Matthew Sullivan, Adviser  Veterinary Surgeon Jim Reilly  Middle-Earth Susan Hart  Trevor Johnstone and David Johnstone  Ian Sauer  Graham McKenna  Myrtle Park Hall Committee Brenda Imlach  Patricia Barwick  Federal Member for Lyons Dick Adams MP
<b>Hobart</b> 28 July 2000	Department of Education Simon Barnsley, Deputy Secretary, Corporate Services  Southport Community Centre Diane Oakley  Channel Enterprise Inc. and HELEC Sales and Systems Colin Hocking  Kingborough Council Rick McLean, General Manager  Bondin Computer Services Joseph Bondin  Tasmanian Farmers and Graziers' Association Peter McKay, Membership Services  Boyes Bros Jim and Anne Taylor

The Inquiry also held an industry roundtable with nine of the larger carriers and service providers participating.

#### **PARTICIPANTS AT INDUSTRY ROUNDTABLE MEETING**

<b>Location and date</b>	<b>Participant</b>
<b>Sydney</b> 12 July 2000	<p>Telstra Corporation Deena Shiff, Director – Regulatory Martin Mercer, Director – Strategy and Business Development Paul Granville, National Manager – Regional Australia, Infrastructure Services and Wholesale</p> <p>Cable and Wireless Optus Paul Fletcher, Director – Regulatory and Public Affairs Judy Anderson, Manager – Regulatory Policy</p> <p>Vodafone Chris Dalton, Regulatory Policy Manager Craig Norton, Regional Strategy Manager</p> <p>AAPT Brian Perkins, Director – Legal and Regulatory David Havyatt, Manager – Regulatory</p> <p>One.Tel Tracey Moore, Corporate Counsel David Wright, CEO One.Tel Networks</p> <p>PowerTel Russell Emery, Manager, Competition Policy Issues</p> <p>Austar Bruce Meagher, Head of Corporate Affairs</p> <p>Macquarie Corporate Telecommunications Maha Kirshnapilli, Senior Executive, Strategy</p> <p>Macrocom Barney Blundell, CEO</p>

## CONSULTATIONS WITH KEY PARTIES AND ORGANISATIONS

In addition to the consultative meetings, the Inquiry held informal meetings in several locations. Inquiry members also visited projects of particular relevance to the terms of reference. Presentations were made by the Queensland Telemedicine Network, Coorong Microwave Project and the Inquiry members viewed operations at the Vodafone Globalstar gateway at Dubbo.

### INFORMAL CONSULTATIONS

Aboriginal and Torres Strait Islander Commission  
Australian Communications Authority  
Australian Telecommunications Users Group (ATUG)  
Cable and Wireless Optus  
Carpentaria Shire Council  
Croydon Shire Council  
Goldfields Esperance Development Commission  
House of Representatives Standing Committee on Communications, Transport and the Arts  
Johanna Plante, CEO, Australian Communications Industry Forum  
John Pinnock, Telecommunications Industry Ombudsman  
Macrocom Pty Limited  
Mugarinya Aboriginal Community  
Multimedia Victoria  
National Farmers' Federation  
Networking the Nation Board  
Pilbara Development Commission  
Queensland Rural Ministerial Advisory Council  
Senate Environment, Communications, Information Technology and the Arts Committee  
Small Enterprise Telecommunications Centre Limited  
Smart Radio Systems  
Tanami Network and Outback Digital Network  
Telstra Corporation  
Terry Cutler, Chairman, National Bandwidth Inquiry  
TransACT Communications Pty Ltd  
Vodafone  
WA Department of Commerce and Trade and Office of Information and Communications  
Warlpiri Media Association  
Women with Disabilities (Australia)  
Yuendumu Community Government Council  
Yuendumu Health Clinic  
Yuendumu Substance Abuse Program  
Yuendumu Women's Centre



## LIST OF SUBMITTERS

- 528 AAPT Limited  
374 Aboriginal Economic Development Advisory Committee  
179 ABSIP Pty Ltd  
1061 ACROD Western Region  
90 Adami, V  
521 Adams, M  
385 Adams, S  
611 Adams, the Hon D MP, Federal Member for Lyons  
871 Agars, C  
765 Agforce Queensland  
955 Agribusiness Committee of the NW Development Initiative  
617 Albany Business Telephones  
547 Albany Chamber of Commerce  
1008 Alice Springs School of the Air  
1011 Anderson, J L  
929 Andrea, P & others  
849 Andreallo, ML  
171 Andren, P MP, Federal Member for Calare  
968 Andrews, CR & NJ  
482 Anonymous  
911 Anonymous  
1046 Anthony Rt Hon JD  
235 Aramac Shire Council  
115 Armstrong, D  
43 Aronson, J  
1023 Atkinson, J E  
32 Atkinson, VR  
236 ATSIC  
827 Auspace Ltd  
1058 Austar  
907 Austen, L  
779 Australian Association of the Deaf  
854 Australian Business Ltd  
1042 Australian Capital Region  
924 Australian Communication Exchange  
988 Australian Competition and Consumer Commission  
986 Australian Council of Social Service  
610 Australian Family Alliance  
461 Australian Information Industry Association  
879 Australian Library and Information Association  
1034 Australian Pensioners & Superannuants League, Qld  
465 Australian Telecommunications Users Group (ATUG)  
974 Australian Telecommunications Users Group (ATUG), Qld  
1044 Bacon, Jim MHA, Premier of Tasmania  
185 Baidon, BG  
914 Bailey, F MP, Federal Member for McEwen  
922 Baily, J & J  
531 Baird, P  
778 Balanced State Development Working Group  
1057 Ballarat Chamber of Commerce  
833 Ballina District Community Services Assn  
612 Baptist Rural Support Services  
697 Barber, R  
299 Barcaldine Shire Council  
666 Barker, N  
422 Barnett, J  
667 Barraba Shire Council  
307 Barrett, FM  
348 Barry, C  
92 Bartlett, R  
326 Barwick, I & P  
913 Barwick, J  
912 Barwick, R & S  
270 Bassingthwaighte, J  
499 Batlow Development League Inc.  
131 Battista, P  
132 Bauer, K & R  
81 Baxter, B  
855 Beck, D & L  
251 Beeson, P  
14 Behrendorff, NB  
992 Belfield, GD  
20 Bell, C  
1010 Beltridge, S  
672 Bennett & Morton  
719 Bennett, AA  
102 Bent, R & T  
760 Better Hearing Australia  
1010 Bettridge, S  
293 Beveridge, B  
113 Biddle, N  
788 Bidwell, P  
214 Bignold, J  
797 bigvolcano.com.au  
981 Billingham, A  
1045 Bingham, J  
105 Birt, P  
504 Black, E  
368 Black, P  
79 Blackall, C  
676 Blackburn, S  
269 Blackmore, R  
223 Blake, P  
442 Blewes, M  
783 Block, S  
636 Blomfield, K  
191 Blyton, IJ  
157 Boggiss, G JP  
31 Boland, G  
56 Boling, MJ  
4 Bolles, HW  
741 Bollinger, AJ  
263 Bombala Council  
129 Bondin Computer Services  
1006 Bonnes, C  
54 Boom, T  
301 Boom-Clarke, ME  
432 Boonah Shire Council  
218 Booth, D  
835 Bordia, Prof S, PNG University of Technology  
840 Bosmac Pty Ltd  
47 Boucher, T  
327 Boulia Shire Council  
808 Bourke Shire Council  
576 Bowden, RH  
356 Bowen Pastoral Company  
313 Bowler, JC & RB  
39 Boxall, D  
420 Boxhall, GW  
168 Boyer, C  
337 Boyes Bros  
119 Boyle, A & R  
721 Bradley, P  
768 Brandenburg, S  
985 Braun, L  
209 Brennan, MM & D  
128 Brentwood Community  
239 Brewster, P  
587 Briggs, J  
998 Broken Hill Chamber of Commerce Inc  
1033 Broken Hill City Council  
999 Broken Hill School of the Air  
45 Brons, R  
492 Brooks, A  
495 Brooks, JK  
848 Brown, B & L  
99 Brown, K  
344 Brown, V  
637 Bruce, K  
161 Bryant, S

165	Bucknell Enterprises Pty Ltd	375	Central Western Queensland Remote Area Planning	555	Communications, Electrical and Plumbing Union (CEPU)
818	Bucknell, R	1050	Central Western Regional Development Board	542	Community and Public Sector Union
490	Budden, C	560	Centre for International Research on Communication and IT (CIRCIT)	416	Connell, LJ
715	Bundilla Partnership	664	CEPU Exec Summary	710	Connolly, P
63	Bunn, R & I	793	Cessnock Wine Country Chamber of Commerce	810	Consumers Telecommunications Network
607	Bunnett, D	698	Chadwick, M	819	Cook Shire Council
973	Bunyarra Christian Centre Whyalla Baptist Church	585	Chaffey, R	873	Cook, S
204	Burgoyne, PF & KL	13	Chalmers, R	163	Cooke, B
294	Burke, B	816	Chamber of Minerals and Energy of WA Inc	386	Cooke, G
17	Burnett, V	844	Chambers, J	885	Cooke, H
6	Bushby, G	982	Chambers, J	958	Cooktown & District Family Resource Centre
84	Bushell, R	875	Chambers, M	122	Coolah Shire Council
632	Buskermolen, F	187	Chandler, GC	436	Cooma-Monaro Shire Council
66	Butcher, SJ	980	Charleville School of Distance Education	139	Coombes, J
352	Byron Shire Echo	501	Chisholm, FE	28	Coombs, J QC
836	C Squared (Aust) Pty Ltd	198	Christensen, RE	140	Cooper, S
972	Cable and Telecoms Ltd	717	Cin, D & D	994	Coromandel Valley Community Association (SA)
563	Cable and Wireless Optus	702	Circular Head Council	516	Coughlan, J
971	Cabonne Council	619	City of Greater Shepparton– Economic Development Unit	107	Coulston, L
257	Callan, WE	514	City of Kalgoorlie-Boulder	724	Council of Australian State Libraries
86	Callow, N	468	Clarence Regional Library	957	Council on the Ageing
832	Cameron, B	196	Clark, P	730	Country Women's Association of WA
449	Cameron, D	614	Clark, P	464	Cowles, C
398	Cameron, R	908	Clarke, JM	18	Crescent Head Chamber of Commerce
640	Cameron, T	312	Clarke, S	395	Croft, R
839	Campaspe Economic Development Board Inc	215	Cleary, M	941	Crome, I
320	Campbell, A	331	Clee, P	369	Crook, DR
274	Campbell, JR & LM	1020	Clifton Shire Council	145	Crook, FC
477	Campbell, K	415	Clorvs, D	247	Crookwell Shire Council
125	Campbell, M	934	Cloudesley, B	194	Crowden, GN & BE
377	Campbell, RD	515	Cluff, K	1030	Croydon Shire Council
815	Canary Island Appin South Road Users	1047	Cobar Shire Council	345	Cullum, J
828	Canegrowers Mackay District	246	Cobb, T	260	Cutler, T
938	Cantelo, G	1066	Coconut Well Ratepayers' & Residents' Association	947	Cyber Justice Pty Ltd
853	Cape Bridgewater Holiday Camp	1032	Cocos (Keeling) Island Administration	658	Dal Zotto, O
950	Cape York Peninsula Development Association Inc	735	Code, G	880	Dartmouth & Eskdale Progress Assn
394	Capp, P	207	Collett, HL & OP	383	Davidson, J
1054	Care Communications and Data	1017	Collings, S	744	Davidson, JS
93	Carlingford Insurance Broker	277	Collins, P	262	Davies, J
863	Carpenter, D & N	421	Collins, RA	713	Davies, LR
631	Carrington, R & V	596	Colville, J	276	Davies, RJ
1069	CAS Netlink (Cyberlink)	856	Combined Pensioners and Superannuants of Victoria Inc	275	Davies, W
655	Cassanet, M	858	Combridge, D	106	Davies, Y
799	Cassels, P & B	202	Commodore Station Pty Ltd	722	Davis, J
16	Catholic Education Centre	535	Communications Experts Group	900	Davnet
538	Caulfield, E			136	Day Dream Island Resort
1075	Central Darling Shire Council			680	De Groot, P
750	Central Great Southern Zone, WA Farmers Federation			371	De Lepervanche, P
124	Central Oz Motorcycle Adventures			889	de Smit, C
803	Central West College of TAFE				

946	Deafness Council of NSW Inc	1040	Eyre Peninsula Local Govt Association	1056	Grampians Info IT & Telecoms Alliance of Rural Hospital
789	Delatite Shire Council	51	Eyre, R	358	Grampians Wartook Promotion Group
75	Denham, J	726	Farnell, S	1013	Grant, J
373	Denison Hotel Pty Ltd	681	Farrall, G	160	Grant, K
451	Dennis Electrical	288	Faulks, EG	524	Grant, R
291	Dent, DL	123	Feather Touch Secretarial Service	552	Great Southern Development Commission
796	Department of Defence	522	Fennell, P	1065	Greater Green Triangle Region Association
904	Destni Park	355	Ferguson, D	1053	Greenhill Enterprise Centre
285	Diener, G	668	Findlay, I	169	Grice, N
454	Diffey, R	570	Finlay, A	929	Griffiths, P and others
771	Dinnie, B	597	Finlay, M	536	Groat, C
817	Disability Services Commission (DSC)	641	Finlay, M	210	Groom, D
52	District Council of Barunga West	802	Fire and Emergency Services of WA	463	Groves, J
758	District Council of Elliston	1035	Fitzgerald, JN	883	GrowZone
841	District Council of Grant	529	Flanagan, M	166	Guinea, V
860	Dodd, K	642	Flannery, R	870	Gulliver, G
87	Doran, J	229	Fletcher, M	467	Gumala Aboriginal Corporation
259	Dosser, L	413	Flinders Council	684	Guyatt, SD
1004	Dossetor, M	88	Flint, R	729	Guyra Shire Council
652	Douglas, K	453	Flying Fish Point & The Coconuts Ratepayers' Ass.	72	Haddrell, D
931	Douglas-Menzies, SJ	469	Ford, G	662	Haddrill, E
186	Douglass, R	234	Fordyce, P & L	930	Hall, P
671	Doxey, H	266	Forth Valley Vet Clinic	333	Hamblin, DR
648	Doyle, P & S	887	Foskey, D	167	Hamilton, P
351	Draper, D	942	Foster, J & L	507	Hamparsum, J
110	Driver, C	661	Frater, D	903	Hanel, L
866	Dubbo Chamber of Commerce	517	Gaden, J	44	Hanna, D
1060	Dubbo City Council	792	Galea, J	162	Hansen, M
895	Ducksbury, A	396	Gamble, W	606	Hanson
1025	Duigan, REV	133	Gawley Plumbing Pty Ltd	101	Hanush, P
865	Duncan, R	484	Gazzoli, M	279	Hardy, B
245	Dunkley, C	117	Gemellaro, T	714	Harper, K
180	Dunn, D	433	Geny, P	150	Harris, M
441	Dunn, NK	608	George Close & Associates	91	Harris, P JP
650	Dunne, J	867	George, A	98	Harris, R
254	Dwyer, G	862	George, M	888	Harris, WR
921	Eales, C	864	Gibson, P & J	318	Harrison, B
937	East Arnhem Land Tourist Association	716	Gill, RW	418	Harrison, M
965	Eastern River Pastoral	513	Gippsland Development Ltd	1	Hart, P & S
593	EdNA Schools Advisory Group	357	Glen Eagle Pastoral Company	943	Hartigan, S
525	Ehret, J	1043	Gold Coast City Council	192	Harvestroad Communications
203	Elliott, L	598	Golden Plains Shire	181	Hatcher, R
740	Emery, H	512	Goldfields Esperance Development Commission	146	Hattam, R
189	English, B	60	Gollan, J	1063	Hawker, D MP, Federal Member for Wannan
302	Ericsson Australia	317	Goodfellow, J	620	Hawthorn, B
747	Esperance Chamber of Commerce and Industry	763	Gotschall, S	89	Hay Accounting & Taxation Services
800	Evans Shire Council	822	Goulburn Valley Regional Library Corporation	580	Haynes, SD
967	Evans, GL & JE	846	Government of Western Australia	22	Healy, E
55	Evans, P	635	Gowing, P	153	Heaney, N
486	Evista Pty Ltd	199	Grail Productions	752	Heartland Communications
1039	Eyre Office of Dept of Education Training Employment			738	Heathcote, D

572	Heffernan, M	993	Jericho, DG & LC	1028	Lawler, Tony MP, Federal Member for Parkes
685	HELEC Sales and Systems	582	Jirman, J	69	Lawless, TD
330	Hemming, N	689	John Packham & Sons	281	Lawry, J
65	Hempton, D	473	John Sykes Rural Consulting	935	Leahy, B
959	Henderson, G	178	Johnson, R	25	Lee, P
390	Henwood, P	95	Johnson, RJ & JO	621	Lesses, T
404	Herberton Shire Council	364	Johnston, AJ & KJ	910	Lewis, J
283	Hertslet, PM	909	Johnstone, GES	660	Liernert, C & A
837	Hildebrandt, M	339	Jones, J	678	Lifeline Newcastle and Hunter
711	Hill, DH	324	Joseph, JW & RG	332	Limon, JL
791	Hindmarsh, R	690	Joseph, K	431	Linden, C
1064	Hobbit Computers	325	JR Morgan & Company	777	Lindsay, C & J
152	Hobbs, H	842	Judd, N	949	Local Emergency Management Committee – Wingecarribee Shire
170	Hodges, P	382	Julbgh, G	1009	Local Government Association of the Northern Territory
264	Hogan, T	703	Jupp, C	448	Local Government Association of Queensland Inc
137	Holt, K	450	Kalgoorlie Regional Hospital	701	Locke, R & L
1001	Horne, B & M	496	Kamsma, P	154	Logan, R
581	Hosking, D	311	Kane, GK&M	286	Longmire, I
723	Howard Nominees Pty Ltd	699	Karacanta, A	227	Longreach Shire Council
341	Howarth, S	975	Karratha College	954	Lord Howe Island Board
430	Howie, GL	289	Kater, EH	402	Lowrey, GJ
295	Huckel, J	725	Katter the Hon R MP, Federal Member for Kennedy	50	Lukes, AM
365	Hufton, J	58	Kehoe, M	932	Lynch, K
694	Hughes-Owen, A & D	205	Keller, A	706	Macauley, D
1022	Hulme, S	622	Kelly, A	923	MacDonald, L
376	Hume Shire Council	523	Kemp, J	534	MacDougall, A
995	Hunt, J	739	Kendell, G	29	Mackay Children's Support Programs Inc
766	Hutchison Telecommunications (Australia)	109	Kennedy, AJ	899	Mackay Hearing Centre
787	Iain Massey and Associates Strategic Consultants	487	Kennedy, J	459	Mackay Tourism and Development Bureau
569	Iansov, P	509	Keys, B	24	Mackay, JE
556	iiNet Group	1027	Killarney Co-Op	491	Macneil, A
894	Ilfracombe Shire Council	435	Kimber, B	918	MacPherson, D
794	Independent Living Centre of Western Australia	877	Kimberley Development Commission	460	Macquarie Corporate Telecommunications
120	Indigo Shire Council	657	King, A & J	155	Maitland, D
1031	Inglewood Shire	483	Kingham, SJ	936	Manassa, D
174	Ingram, J	334	Kingham, W	419	Mann, P
268	Irvin, CN	323	Kinnoul Group	19	Marnie, J
603	Irvine, G	527	Kirby, JK	444	Martel, AH
969	ISIS Telecommunications P/L	530	Kitchener P & C Association	575	Martin, G
674	Isolated Children's Parents Association of Aust	963	Klaute, J	707	Martin, I
804	Isolated Children's Parents Association SA Council	230	Knight, JP	363	Martin, L
940	Jackson, E	466	Knox, T	656	Maslin, R
746	Jackson, F	618	Kohihagen, L	1019	Mather, K & I
321	Jacobs, K	786	Kondys, E	370	Matilda Internet
745	Jansen, O	952	Krause, P & S	526	Maybury, L
40	Jaques, K	574	Kung, J	428	McAuley, WJ
182	Jarlmadangah Burru Aboriginal Corporation	216	Kurrle, LM	537	McCaughey Memorial Institute
718	Jed, A	693	Lambie, J	1018	McClymont, J A
902	Jelbont, J	349	Lamprell, B		
439	Jennings, W	213	Lancelin Medical Centre		
541	Jenny's Lake Farmstay	609	Landers, FG		
		979	Landers, JW		
		379	Lane, G		
		296	Laurie, C		
		384	Laurie, D		
		434	Laver		

308	McDonald, B	554	Mount Barker Primary School	956	Northern Territory Library and Information Service
589	McDonald, C	595	Mount Helena Residents & Ratepayers Association	933	Norton, S
244	McDonald, D			696	NSW Farmers Federation
329	McDonald, S	960	Mount Isa Chamber of Commerce	558	NSW Farmers Federation (supplementary submission)
850	McDougall, S	983	Mount Isa School of the Air	926	NSW Fire Brigade
316	McGee, S	476	Mt Zero Log Cabins	876	NSW Young National Party
634	McGinnis, D	1012	Mudra, M	545	Nullagine Medical Clinic
649	McGinnis, L	188	Mueller, F	644	O'Brien, G & A
505	McIntosh, WR	488	Muffet, W	211	O'Donoghue, D
561	McIntyre, AM	996	Muir, AR	300	O'Donnell, M
30	McIntyre, I	544	Multimedia Victoria	925	Office of the Regional Commander WA Police Service
566	McIntyre, PG	219	Mundy, A	939	O'Flynn, G
953	McKenzie-Fox, M	915	Murphy, MI	859	Ogden, R
540	McKeon, J	233	Murphy, RM	677	O'Hara, K
742	McLean, DJ	709	Murray, D	951	O'Hara, W
869	McLean, E	417	Murray, GS	633	O'Mally, W & P
869	McLean, E	1036	Murray, MB & GA	1048	One.Tel GSM 1800 Pty Ltd
48	McManus, L	851	MurrayLink Libraries Inc	782	Onsite Mechanical Services
494	McMaster, AR	423	Myrtle Park Hall Committee	737	Orange Chamber of Commerce and Industry
743	McRae, M	424	Narrandera Shire Council	452	Osborne, S
1071	McWaros Pty Ltd	67	Nation, B	616	Osstini, B
708	Meares, T	757	National Indigenous Media Association of Australia	438	Ottens, JT
588	Menkens, JJ	767	National Party of Australia (Queensland)	682	Outback Areas Community Development
736	Menzies, SF	15	NatTel Pty Ltd	997	Outback Regional Development Organisation Inc
564	Miguel, J & P	144	Nayada, RL & YE	695	Owens, S
221	Mike's Angus Cattle Stud	592	NCL Purvis and Son	156	Owens-Brownbill, J
1003	Milde, R	1070	Neighborhood Cable	795	Palmer, JA
83	Milera, P	2	Neil, C	412	Parker, F
12	Miles, R	226	Nerong Progress Association	387	Parker, FM
1055	Miller, A	338	New England-North West Regional Devlpmt Board	1015	Parker, N
46	Miller, M	546	Newton, I	397	Parkin, J
498	Miller, NR	1076	Newton, M	770	Parry, J
206	Millsom, M	141	Nhulunbuy Corporation Limited	732	Parslow, C
217	Millwood, ND	651	Nicholson, B	639	Parsons, D
1002	Mirani Medical Pty Ltd	970	Noble, B	114	Passfield, L
753	Mistake Creek Area Progress Association Inc.	112	Noble, P	559	Pastoralists & Grazers Association of W.A.
663	Mitchell, K & S	764	Norlink Telecomms	429	Patton, W
905	MITEZ Inc	628	Normandy Mining - Tennant Creek	100	Pearce, P
948	Mitra Internet Consulting	1062	Norris, R	116	Pearson, MD
626	Moller, P	769	North Eastern Wheatbelt Regional Org. of Councils	566	Pechette, D
243	Montgomerie, AD	149	North Ward of Swan Shire Community	111	Peel Development Commission
1007	Moody, N	819	Northern Rivers Area Health Service	26	Pemberton, M
228	Mooney, G	687	Northern Rivers Group Training	319	Penfold, T
599	Moore Park Community Association Inc	683	Northern Rivers IT	74	Perkins, S
675	Moore, G	1026	Northern Territory Cattlemen's Association	1038	Perry Shire Council
406	Moore, J	688	Northern Territory Government	151	Peters, F
1052	Morgan, J			108	Picknell, T
284	Morphett, D & AL			80	Pihl, E
142	Morphett, G & H				
249	Morris, C				
1073	Morrison, D				
479	Morrissey, J				
401	Morton, HS				
728	Morton, PW				
518	Mossy Point Community Association				

354	Pike, S	646	Rogers, H	34	Skipper, B
748	Pilbara Development Commission	9	Rokita, R	389	Skrivan, J
990	Pilz, WP	820	Rolls, T	847	Slack, B
64	Pines, JE & EF	600	Rosalie Shire Council	549	Small Enterprise Telecommunications Centre Limited (SETEL)
78	Pipers Brook Vineyard	426	Rose, B	601	Small, G
1072	Pitman, M	784	Ross, W & B	261	Small, P
173	Pollard, P	886	Rostron, G	256	Smallwood, D
400	Pollock, K	659	Rouse, R	785	Smart Radio Systems Pty Ltd
305	Poole, V	1000	Royal Flying Doctor Service (South Eastern Section)	624	Smith, B
884	Port Hedland Chamber of Commerce	976	Royal Flying Doctor Service Queensland	1029	Smith, DJ
5	Powell, D	557	Royal Flying Doctors Service, Western Operations	61	Smith, I
809	Powertel	1051	Rural City of Ararat	242	Smith, JA
159	Practical Engineering	705	Russell, G	35	Smith, K
927	Pratt, CS	480	Ryan, JE	8	Smith, R
23	Pride, D	267	Rylstone Shire Council	485	Smith, V
425	Priestly, S	121	S & S Ironbark Pastoral	369	Smith, W
861	Provel, B	96	Salih, E	172	Smith's Vineyard
225	Pursehouse, R	456	Salmon Gums Development Group	237	Solar-Mesh Sun Control Device
59	Putty Community Association	812	Sampson, J	627	Solly, D
135	Quagliata, P & C	346	Sampson, R	761	South Australian Farmers Federation
1037	Queensland Chamber of Commerce & Industry SW Qld	978	Sands, R	360	South West Development Commission
917	Queensland Chamber of Commerce and Industry	991	Sarina Shire Council	843	South West Strategy
1016	Queensland Country Women's Assoc - Winton Branch	309	Sarnowski, J	551	Southern Province Projects Group (SPPG)
977	Queensland Government	42	Sauer, I	457	Southern Telecentres
445	Queensland Rural Women's Network Inc	71	Saul, E	353	Southport Community Centre
195	Quiggin, J	586	Savage, R	1041	Spencer Institute of TAFE
399	Quirindi Shire Council	127	Sawday, R	103	Speon, C
813	Randall's Newsagency	945	Scales, J	248	Spouge, B
638	Rathmell, P	232	Schmidt, WH	731	Springer, EJ
405	Rawlins, RW	573	Schmitzer, D	366	Squire, B
647	Rawsthorn, D	36	Schwartz, L	772	St James and Devenish Communities
388	Ray, G	700	Scott, R	625	St John Ambulance-Kambalda Sub Centre
27	Ray, J	85	Sealy, P	489	Stackman, E
411	Read, P	773	Seekamp, R	961	Stallion Networking
367	Reardon, P	928	Severin, B & H	591	Stanley, I
1053	Regional Connectivity Project	630	Shaw, R & J	378	Stanley, N
290	Reid, D&E	629	Shearsby, G	282	Stanthorpe Shire Council
919	Reid, P	712	Shipp, R	197	Steele, R
987	Relf, M	984	Shire of Ashburton	147	Stephens, KR
350	Richard, J	493	Shire of Carnamah	565	Stevenson, RT
391	Richards, R	252	Shire of Gnowangerup	143	Stewart, C
440	Ridley and Co	1021	Shire of Laverton	893	Stewart, D
427	Riley, S	126	Shire of Menzies	665	Stokes, C
403	Ripps, C	890	Shire of Nannup	503	Stone, J
798	Riverina Regional Development Board	474	Shire of Ngaanyatjarraku	881	Stone, the Hon Dr S MP, Federal Member for Murray
776	Roach, RD	455	Shire of Westonia	502	Stoney, T
253	Roberts, H	824	Shire of Wyndham	814	Storio, D & A
583	Robinson, P & M	380	Shore, L	297	Strachan, N
304	Rochford, JA	602	Sidebottom, S MP, Federal Member for Braddon	811	Sturt Vale Station
578	Rockview Station	193	Simmons, K		
		872	Simpson, P & R		
		362	Single, J		
		780	Skennar, L		

604	Suckling, N	838	Trogan Fisheries	443	Wheatley, L
41	Sun City Business Centre	201	Tuffield, N	310	Wheaton, B
176	Swain, B	446	Tumbarumba Shire Council	857	Whillock, JA
720	Swain, P	500	Tweedie, B	1074	Whitmore, DM
73	Sweeney, R	57	Twigg, RJ	158	Wildblood, P
409	Sweet, H	605	Twomey, P	292	Wilkes, GK
408	Sweet, J	805	University of WA, Albany Centre	70	Williams, D & N
410	Sweet, JR	669	Urapuntja Health Service	692	Williams, J
407	Sweet, K	781	Vallentine, R	807	Williams, S
874	Symonds, R & K	508	van der Lee, A	891	Willis's Walkabouts
920	Tablelands Online	3	van Geytenbeek, P	584	Willowie Pastoral Co
447	Tallaganda Shire Council	553	Victorian Farmers Federation (VFF)	303	Wilson, GM
343	Tambellup Telecentre	733	Victorian Government	966	Wilson, R
577	Tamplon, G	519	Vidler, RD	381	Wilsons Creek/Huonbrook Progress Association Inc
1068	Tanami Network	184	Vile, RG	762	Wimmera Development Association
208	Taplin, M	372	Vogel, R	361	Windeyer, MF
1059	Tasmanian Farmers & Graziers Association	68	Von Kontz, S	148	Windridge Pig Farm
1044	Tasmanian Government	532	WA Department of Education	10	Wing, R
238	Taylor, A	845	Wakefield Regional Council	1024	Wise, H
906	Telecentre Committee Coonamble	481	Wakelin, B MP, Federal Member for Grey	892	Withers, WR
896	Telecommunications Industry Ombudsman	916	Walgett Aboriginal Medical Service	241	Womblebank Cattle Co
704	TeleTask Pty Ltd	11	Walk North-Byron Bay Walking Tours	462	Women for Power
751	Telstra Corporation	571	Walker	38	Women With Disabilities Australia
511	Temcrown Pty Ltd t/as Nullagine Roadhouse	1014	Walker, D	177	Wonderley, A
231	Temple, J	37	Walker, K	821	Woolner Station
258	Thackeray, AJ & P	138	Wallace, PB & PR	347	Worrell, I
756	The Institute of Strata Title Management Ltd	7	Wangaratta Unlimited	392	Worthington, V
670	The Queensland Country Women's Association	775	Ward, M	53	Wowan/Dululu Landcare Group
759	The Rural Development Centre	567	Warg, AW	497	Wright, P
645	The Technology Group	898	Warren Blackwood Health Service	539	Wright, WA
878	Thompson, K	359	Wartook Gardens Bed & Breakfast	654	Wudinna & Districts Telecentre Committee
183	Thompson, N	1067	Waters, AG	82	Wyong Shire Council
437	Thomson, K	989	Watson, DL & NA	901	Yandeyarra Remote Community School
686	Thorburn, R	613	Webb, R	590	Yeadon, K
240	Thornton, J	118	Weissenfeld, PE	691	Yetholm Pastoral Company
852	Thynne & Macartney, Solicitors	533	West Australian Farmer's Federation	322	Young, C
265	Tibbles, G	1005	Western Australian Government	897	Young, E
220	Tint-A-Car	255	Western Division Group of the Shires Assoc of NSW	962	Young, G
673	Todd, GE	882	Western Flora	287	Young, JH
562	Tom Moss Auto Repairs	272	WF Garnham & Son	964	Young, R
510	Towong Shire Council	944	Whatmore, C	550	Yuryevic, R
579	Toynon, D	834	Wheatbelt Development Commission	104	Zippel, R
315	Tresname Pty Limited Murray Grey Stud			76	Zivkovic, T
224	TriTel Australia Pty Ltd			175	Zweck, A
				475	Zweck, P



## APPENDIX B—INDEPENDENT RESEARCH

To assist in its research on performance issues the Inquiry commissioned three consultancies. The consultants were selected following an open tender process. Final reports for each consultancy are available at <http://www.telinquiry.gov.au>.

### CONSULTANCY FOR MARKET RESEARCH ON CONSUMER DEMAND FOR, AND EXPECTATIONS OF, TELECOMMUNICATIONS SERVICES

This consultancy was undertaken by Research International. It commenced in May 2000 and was completed in August 2000.

The main aim of this research was to identify telecommunications needs and service expectations of residents and small businesses.

Other research objectives included:

- ▶ investigating the overall satisfaction with, and relative importance of, telecommunications in relation to other service industries;
- ▶ identifying consumer perception of change in the overall delivery of telecommunication services in the last two years;
- ▶ identifying consumers' current and future requirements with respect to telecommunication services;
- ▶ identifying the service aspects which are important to consumers and whether these service aspects are identified in the Customer Service Guarantee; and
- ▶ identifying whether the needs of consumers with special telecommunication requirements are being met.

The research was based on a national telephone survey of 2008 residential households and small businesses from metropolitan, regional, rural and remote areas of Australia.

### CONSULTANCY TO ASSESS THE TELECOMMUNICATION NEEDS FOR A COMPREHENSIVE RANGE OF USER GROUPS

This consultancy was undertaken by Gibson Quai. It commenced in May 2000 and was completed in August 2000. The research was commissioned to assist the Inquiry assess the basic and advanced telecommunications needs of all Australians and form judgements as to whether their needs are being met.

The purpose of the consultancy was to frame and perform comprehensive research and analysis into the full range of telecommunications requirements for all Australians, within an agreed set of broad user categories. A key objective was to develop appropriate user categories and provide an analysis of the hierarchy of telecommunications requirements for each category, taking into account any geographical differences.



## **CONSULTANCY TO CONDUCT RESEARCH AND ANALYSIS INTO NEW MARKET MODELS FOR DELIVERY OF TELECOMMUNICATIONS AND ONLINE SERVICES IN REGIONAL AUSTRALIA**

This consultancy was undertaken by Network Economics Consulting Group, in association with Regional Innovation Pty Ltd and ADP Consulting. It commenced in May 2000 and was completed in July 2000.

The project provided input to the work of the Inquiry by undertaking research and related analysis on the types of new market models that have been developed and implemented in various regions of Australia and comparable overseas countries. It assessed the effectiveness of these models in improving regional service delivery, and assessed the wider applicability of models in regional, rural and remote Australia.

The outcome of the consultancy was a report to the Inquiry on how new market models may be applied in Australia, taking into account:

- ▶ new market models that have not been effective on a self-sustainable basis;
- ▶ new market models that have been effective and self-sustaining; and
- ▶ the existence of background conditions, more generally in regional Australia, that are similar to those applying where new market models have been effective and self-sustaining.

## APPENDIX C—CUSTOMER SERVICE GUARANTEE TIMEFRAMES

The Customer Service Guarantee (CSG) Standard sets out minimum timeframes for the connection of services and repairs of faults based both on the type of connection and the geographic location of the site. The following tables define the geographic areas and the relevant timeframes that existed under the original Standard that commenced in 1998 and apply under the CSG Standard which commenced on 7 July 2000.

**TABLE C.1: CONNECTIONS**

Type of Connection	Connection time under CSG Standard 1997	Connection time under CSG Standard 2000
<b>In-place connection</b>		
All sites that have an 'in-place' connection	Within 3 working days of customer's application	Within 2 working days of customer's application
<b>Close to available cabling or other infrastructure</b>		
Community of more than 10 000 people (Urban)	Within 5 working days of customer request	Within 5 working days of customer's application
Community of between 2500 and 10 000 people (Major rural)	Within 10 working days of customer request	Within 10 working days of customer's application
Community of between 200 and 2500 people (Minor rural)	Within 40 working days of customer request	Within 30 working days of customer's application*
Community of less than 200 people (Remote)	Within 40 working days of customer request.	Within 30 working days of customer's application*
<b>Not close to available cabling or other infrastructure</b>		
Community of more than 10 000 people	Within 1 month of customer request	Within 1 month of customer's application
Community of between 2500 and 10 000 people	Within 1 month of customer request	Within 1 month of customer's application
Community of between 200 and 2500 people	Within 6 months of customer request	Within 6 months of customer's application
Community of less than 200 people or where the community is not within a standard call charging zone	Within 12 months of customer request for new applications made after 1 July 1998	Within 12 months of customer's application

\* This timeframe will be reduced to within 15 working days after 30 June 2001.

**TABLE C.2: REPAIR OF FAULTS**

<b>Location</b>	<b>Time for repair under CSG Standard 1997</b>	<b>Time for repair under CSG Standard 2000</b>
Urban (areas in Australia population greater than 10 000 people)	End of next working day after report	End of next working day with a after report
Rural and remote	End of next working day after report in certain situations*	End of next working day after report in certain situations*
Rural (areas in Australia other than urban areas and remote areas)	End of second working day after report	End of second working day after report
Remote (areas in Australia with a population less than 200 people)	End of third working day after report	End of third working day after report

\* These situations include where the fault occurs due to an administrative error by the phone company, or if the fault can be rectified without the company attending customer premises or undertaking external plant work.

## APPENDIX D—CUSTOMER SERVICE GUARANTEE PERFORMANCE AND SERVICE RELIABILITY

### IMPACT ON PERFORMANCE CAUSED BY THE CHANGES IN THE NEW CUSTOMER SERVICE GUARANTEE

To enable some judgement regarding the impact of the new Customer Service Guarantee (CSG) Standard on service performance, Telstra provided the Inquiry with its March 2000 quarter results adjusted to reflect what its performance would have been using the new CSG Standard 2000 and its actual July and August 2000 performance figures. The tables that follow present the results for each State and Territory.

**TABLE D.1: ESTIMATED IMPACT ON TELSTRA'S PERFORMANCE CAUSED BY CHANGES IN THE CSG STANDARD, IN-PLACE CONNECTIONS, JANUARY–MARCH 2000**

	Performance against the CSG Standard 1997			Estimated performance against the CSG Standard 2000			Difference		
	Jan-00	Feb-00	Mar-00	Jan-00	Feb-00	Mar-00	Jan-00	Feb-00	Mar-00
NATIONAL	97.5%	96.9%	96.4%	97.0%	96.3%	95.9%	-0.5%	-0.6%	-0.6%
QLD	97.8%	96.7%	96.4%	97.3%	96.0%	96.0%	-0.4%	-0.7%	-0.4%
NSW/ACT	97.5%	97.2%	96.4%	97.1%	96.8%	95.7%	-0.4%	-0.4%	-0.7%
VIC	96.6%	95.9%	96.1%	96.0%	95.1%	95.4%	-0.6%	-0.8%	-0.7%
TAS	98.3%	97.8%	96.9%	97.7%	97.2%	96.3%	-0.5%	-0.7%	-0.7%
SA	97.8%	97.3%	97.3%	97.4%	97.0%	97.2%	-0.4%	-0.4%	-0.2%
NT	97.4%	95.6%	97.0%	96.8%	93.7%	96.7%	-0.6%	-1.9%	-0.3%
WA	98.2%	97.8%	96.7%	97.9%	97.4%	96.4%	-0.4%	-0.3%	-0.3%

Source: Telstra (adjusted data).

Note: Difference calculations may contain some rounding adjustments. Telstra's performance is adjusted for factors that are outside the control of Telstra and where Telstra has been granted an exemption from the CSG Standard.

Telstra provided data concerning its performance in reconnecting in-place services for the first two months under the new CSG Standard 2000 (refer Table D.2). There is insufficient data to make direct comparison or infer any trends but the results are, in general, consistent with Telstra's recent performance in each State and Territory.

**TABLE D.2: TELSTRA'S ACTUAL PERFORMANCE AGAINST THE NEW CSG STANDARD, IN-PLACE CONNECTIONS**

	Performance against the CSG Standard 2000	
	July 2000	August 2000
NATIONAL	95.2%	94.1%
QLD	94.8%	94.0%
NSW/ACT	95.2%	93.8%
VIC	94.7%	93.6%
TAS	96.2%	95.2%
SA	96.4%	95.0%
NT	96.9%	95.8%
WA	96.4%	95.0%

Source: Telstra (adjusted data).

Note: Telstra's performance is adjusted for factors that are outside the control of Telstra and where Telstra has been granted an exemption from the CSG Standard.

**TABLE D.3: ESTIMATED IMPACT ON TELSTRA'S PERFORMANCE CAUSED BY CHANGES IN THE CSG STANDARD, NEW SERVICE CONNECTIONS IN MINOR RURAL AREAS WITH INFRASTRUCTURE, JANUARY–MARCH 2000**

	Performance against the CSG Standard 1997			Estimated performance against the CSG Standard 2000			Difference		
	Jan-00	Feb-00	Mar-00	Jan-00	Feb-00	Mar-00	Jan-00	Feb-00	Mar-00
NATIONAL	98.9%	98.9%	98.9%	98.1%	98.1%	98.3%	-0.8%	-0.8%	-0.5%
QLD	99.3%	99.3%	98.8%	99.0%	99.2%	99.1%	-0.2%	-0.1%	0.3%
NSW/ACT	98.5%	99.0%	98.6%	97.7%	98.1%	97.6%	-0.8%	-0.9%	-1.0%
VIC	99.0%	98.0%	99.3%	97.6%	96.6%	98.5%	-1.5%	-1.4%	-0.8%
TAS	99.5%	98.3%	100%	99.4%	97.4%	99.4%	0.0%	-0.9%	-0.6%
SA	98.9%	99.6%	98.6%	97.8%	98.2%	98.4%	-1.0%	-1.4%	-0.2%
NT	100%	100%	100%	100%	100%	100%	0.0%	0.0%	0.0%
WA	98.7%	99.1%	98.7%	98.0%	98.1%	97.4%	-0.7%	-0.9%	-1.3%

Source: Telstra (adjusted data).

Note: Difference calculations may contain some rounding adjustments. Telstra's performance is adjusted for factors that are outside the control of Telstra and where Telstra has been granted an exemption from the CSG Standard.

Table D.4 shows that in the first two months after the introduction of the new Standard Telstra's performance remained well above 90 per cent in each State and Territory for connecting new services in minor rural areas where there was available infrastructure.

**TABLE D.4: TELSTRA'S ACTUAL PERFORMANCE AGAINST THE NEW CSG STANDARD, NEW SERVICE CONNECTIONS IN MINOR RURAL AREAS WITH INFRASTRUCTURE**

	Performance against the CSG Standard 2000	
	July 2000	August 2000
NATIONAL	97.9%	98.5%
QLD	97.6%	98.9%
NSW/ ACT	98.6%	98.6%
VIC	98.0%	98.1%
TAS	98.8%	99.2%
SA	98.3%	97.8%
NT	100%	93.7%
WA	96.4%	98.4%

Source: Telstra (adjusted data).

Note: Telstra's performance is adjusted for factors that are outside the control of Telstra and where Telstra has been granted an exemption from the CSG Standard.

**TABLE D.5: ESTIMATED IMPACT ON TELSTRA'S PERFORMANCE CAUSED BY CHANGES IN THE CSG STANDARD, NEW SERVICE CONNECTIONS IN REMOTE AREAS WITH INFRASTRUCTURE, JANUARY–MARCH 2000**

	Performance against the CSG Standard 1997			Estimated performance against the CSG Standard 2000			Difference		
	Jan-00	Feb-00	Mar-00	Jan-00	Feb-00	Mar-00	Jan-00	Feb-00	Mar-00
NATIONAL	96.4%	97.3%	99%	95.7%	97.9%	98.3%	-0.7%	0.6%	-0.7%
QLD	97.9%	97.9%	98.4%	98.5%	97.1%	99%	0.5%	-0.8%	0.6%
NSW/ACT	100%	100%	100%	100%	100%	93.3%	0.0%	0.0%	-6.7%
VIC	100%	–	100%	100%	–	100%	0.0%	n/a	0.0%
TAS	–	–	–	–	–	–	n/a	n/a	n/a
SA	100%	100%	100%	100%	100%	100%	0.0%	0.0%	0.0%
NT	90.9%	98.9%	98.7%	93.5%	97.3%	96.7%	2.6%	-1.6%	-2.0%
WA	96.6%	94.7%	100%	91.8%	98.8%	100%	-4.8%	4.1%	0.0%

Source: Telstra (adjusted data).

Note: There are no remote areas, as defined under the CSG Standard, in Tasmania. For February 2000 there were no new connections requested in Victorian remote areas. Difference calculations may contain some rounding adjustments. Telstra's performance is adjusted for factors that are outside the control of Telstra and where Telstra has been granted an exemption from the CSG Standard.

n/a: Not applicable.

Table D.6 shows that similar to its performance in minor rural areas, in the first two months after the introduction of the new Standard, Telstra's performance was well above 90 per cent in remote areas of each of the States and Territories.

**TABLE D.6: TELSTRA'S ACTUAL PERFORMANCE AGAINST THE NEW CSG STANDARD, NEW SERVICE CONNECTIONS IN REMOTE AREAS WITH INFRASTRUCTURE**

	Performance against the CSG Standard 2000	
	July 2000	August 2000
<b>NATIONAL</b>	<b>96.1%</b>	<b>98.8%</b>
QLD	100%	100%
NSW/ ACT	95.5%	100%
VIC	n/a	100%
TAS	n/a	n/a
SA	93.3%	100%
NT	96.2%	97.6%
WA	90.2%	98.3%

Source: Telstra (adjusted data).

Note: There are no remote areas, as defined under the CSG Standard, in Tasmania. For July 2000 there were no new connections requested in Victorian remote areas. Telstra's performance is adjusted for factors that are outside the control of Telstra and where Telstra has been granted an exemption from the CSG Standard.

n/a: Not applicable.

## TELSTRA'S PERFORMANCE UNDER THE NEW STANDARD

Table D.7 details Telstra's performance in July and August 2000 against the CSG Standard for both connections and repairs, across different geographic areas. This represents the first two months of performance data against the new Standard.

**TABLE D.7: TELSTRA'S PERFORMANCE AGAINST THE CSG STANDARD 2000 TIMEFRAMES FOR CONNECTING SERVICES WITH AND WITHOUT INFRASTRUCTURE, RECONNECTING SERVICES AND FAULT REPAIRS, BY GEOGRAPHIC AREA**

Type of service	Area	Performance against the CSG Standard 2000	
		July 2000	August 2000
In-place connections	<b>National *</b>	<b>95%</b>	<b>94%</b>
New connections with infrastructure	Urban	93%	94%
	Major rural	96%	96%
	Minor rural	98%	98%
	Remote	96%	99%
	<b>National</b>	<b>93%</b>	<b>94%</b>
New connections without Infrastructure	Urban	86%	84%
	Major rural	82%	85%
	Minor rural	99%	97%
	Remote	100%	100%
	<b>National</b>	<b>89%</b>	<b>88%</b>
Fault repair	Urban	87%	91%
	Rural	90%	95%
	Remote	83%	88%
	<b>National</b>	<b>88%</b>	<b>92%</b>

Source: Telstra (adjusted data).

Note: Telstra's performance is adjusted for factors that are outside the control of Telstra and where Telstra has been granted an exemption from the CSG Standard.

\* As the CSG timeframes to connect an in-place service are the same wherever the consumer resides, this figure is an aggregate for urban, rural and remote areas.

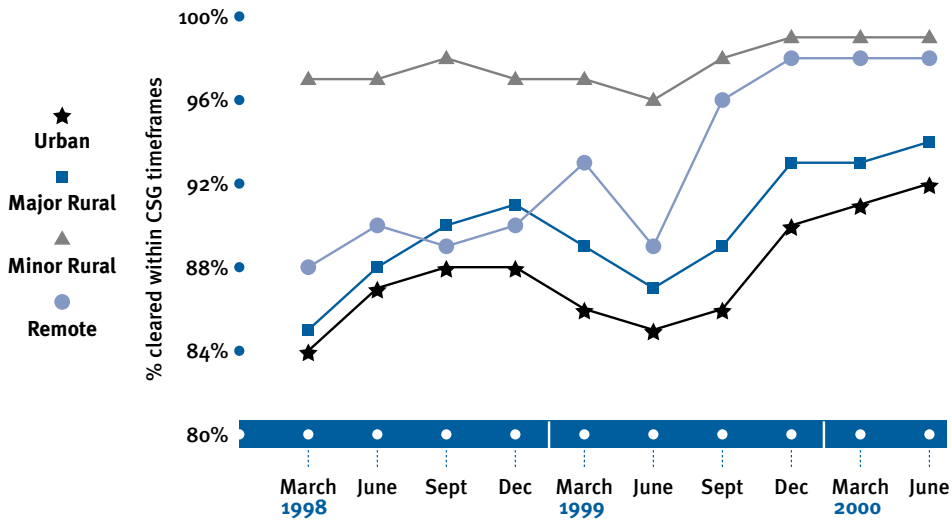


## TELSTRA'S CSG PERFORMANCE UNDER THE 1997 STANDARD

### SERVICE CONNECTIONS WITH INFRASTRUCTURE

Figure D.1 refers to Telstra's performance since the March 1998 quarter at the national level for the provision of new services against the CSG Standard for urban, major and minor rural and remote areas with available infrastructure. Since January 1998 there have been approximately 1.4 million requests for new services where there was available infrastructure that were subject to the CSG. While showing only marginal levels of improvement over time, Telstra's best performance was recorded in minor rural areas where it was able to consistently connect 96 per cent or greater of new services. Telstra has improved its performance in all four geographical areas since the March 1998 quarter, with much of the improvement occurring since the first quarter of 1999. By the first and second quarters of 2000 performance figures exceed 90 per cent.

**FIGURE D.1: TELSTRA'S PERFORMANCE AGAINST THE CSG STANDARD, NEW SERVICE CONNECTIONS IN AREAS WITH INFRASTRUCTURE, MARCH QUARTER 1998 TO JUNE QUARTER 2000**



Source: Australian Communications Authority (unadjusted data).

Telstra's performance in each State and Territory for the last two financial years varied only marginally from the national average. Only in the Northern Territory and Western Australia was Telstra's performance below the public's expectations of performance as identified in Chapter 5.

**TABLE D.8: TELSTRA'S PERFORMANCE AGAINST THE CSG STANDARD, NEW SERVICE CONNECTIONS IN AREAS WITH INFRASTRUCTURE, BY STATE/TERRITORY, 1998-99 AND 1999-2000**

	Urban areas		Major rural areas		Minor rural areas		Remote areas	
	98-99	99-00	98-99	99-00	98-99	99-00	98-99	99-00
QLD	91%	91%	91%	95%	98%	99%	95%	98%
NSW/ACT	87%	90%	89%	92%	97%	98%	94%	99%
VIC	91%	91%	90%	92%	97%	99%	100%	100%
TAS	87%	92%	91%	93%	98%	99%	–	–
SA	85%	91%	88%	93%	97%	99%	98%	99%
NT	74%	85%	78%	90%	94%	99%	80%	95%
WA	86%	88%	86%	92%	95%	98%	94%	97%
<b>NATIONAL</b>	<b>88%</b>	<b>90%</b>	<b>89%</b>	<b>93%</b>	<b>97%</b>	<b>99%</b>	<b>91%</b>	<b>97%</b>

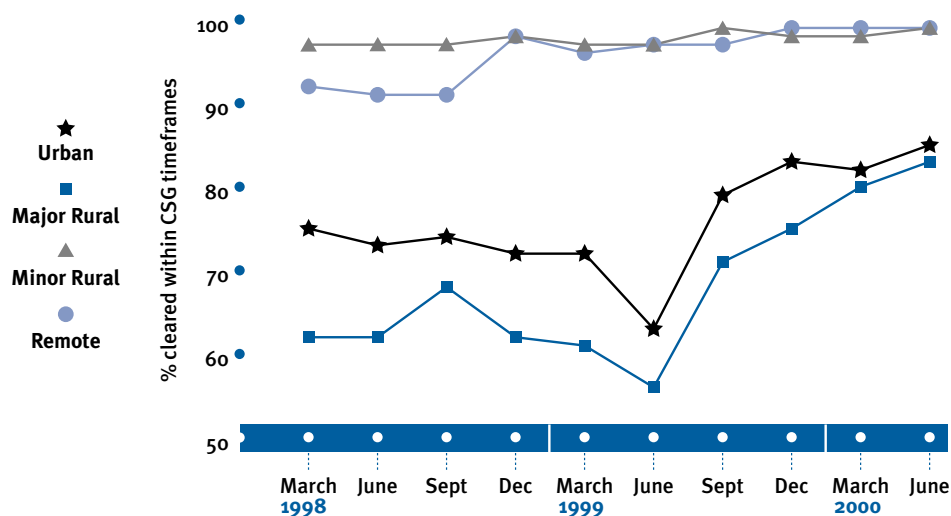
Source: Telstra (adjusted data).

Note: Tasmania has no remote areas as defined under the CSG Standard. Telstra's performance is adjusted for factors that are outside the control of Telstra and where Telstra has been granted an exemption from the CSG Standard.

## SERVICE CONNECTIONS WITHOUT INFRASTRUCTURE

Figure D.2 refers to Telstra's quarterly performance since the March 1998 quarter, at the national level, for the provision of new services in urban, major and minor rural and remote areas without available infrastructure. There have been approximately 140 000 such requests since 1998. Again, Telstra improved its performance in each of the four geographic areas since the March 1998 quarter. However, unlike performance in areas where there was available infrastructure, there is a significant variation in performance across the four geographical areas. In minor rural and remote areas Telstra has consistently connected over 96 per cent of services within the prescribed timeframe since the December quarter 1998. In urban and major rural areas, Telstra has performed at significantly lower levels.

**FIGURE D.2: TELSTRA'S PERFORMANCE AGAINST THE CSG STANDARD, NEW SERVICE CONNECTIONS IN AREAS WITHOUT INFRASTRUCTURE, MARCH QUARTER 1998 TO JUNE QUARTER 2000**



Source: Australian Communications Authority (unadjusted data).

Again, there were only minor variations between Telstra's annual performance in each State and Territory for the last two financial years. However, with the exception of its performance in remote areas, Telstra performed significantly below the national average in the Northern Territory.

**TABLE D.9: TELSTRA'S PERFORMANCE AGAINST THE CSG STANDARD, NEW SERVICE CONNECTIONS IN AREAS WITHOUT INFRASTRUCTURE, BY STATE/TERRITORY, 1998-99 AND 1999-2000**

	Urban areas		Major rural areas		Minor rural areas		Remote areas	
	98-99	99-00	98-99	99-00	98-99	99-00	98-99	99-00
QLD	84%	87%	73%	84%	99%	99%	98%	100%
NSW/ACT	64%	82%	62%	77%	94%	97%	92%	98%
VIC	71%	80%	54%	75%	98%	99%	100%	100%
TAS	70%	88%	58%	81%	99%	100%	-	-
SA	62%	84%	69%	82%	99%	99%	97%	100%
NT	66%	76%	41%	60%	82%	91%	94%	97%
WA	83%	82%	69%	80%	98%	99%	98%	99%
<b>NATIONAL</b>	<b>71%</b>	<b>83%</b>	<b>62%</b>	<b>77%</b>	<b>97%</b>	<b>98%</b>	<b>96%</b>	<b>99%</b>

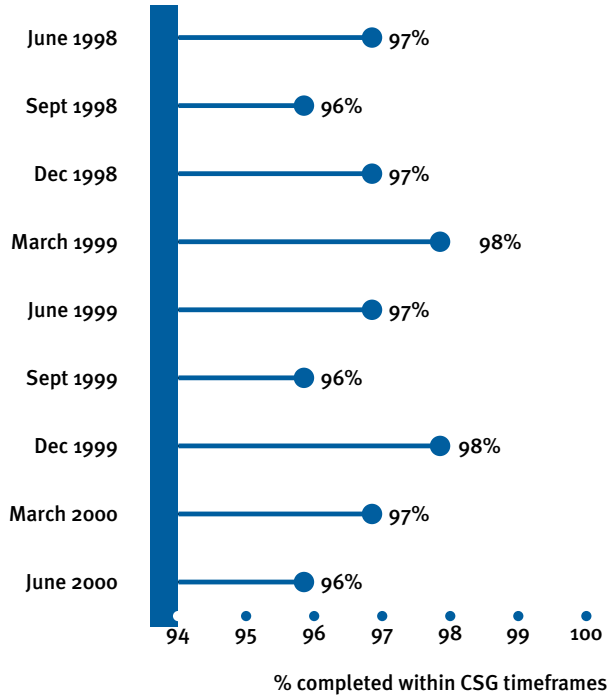
Source: Telstra (adjusted data).

Note: Tasmania has no remote areas as defined under the CSG Standard. Telstra's performance is adjusted for factors that are outside the control of Telstra and where Telstra has been granted an exemption from the CSG Standard.

## IN-PLACE SERVICE CONNECTIONS

Figure D.3 refers to Telstra's performance since the June 1998 quarter at the national level for the provision of in-place services against the CSG Standard. Telstra was able to consistently connect 96 per cent or greater of all in-place services over the period of the analysis. There were approximately 4.2 million requests for reconnections since April 1998.

**FIGURE D.3: TELSTRA'S PERFORMANCE AGAINST THE CSG STANDARD, IN-PLACE SERVICE CONNECTIONS, JUNE QUARTER 1998 TO JUNE QUARTER 2000**



Source: Australian Communications Authority (unadjusted data).

There were no significant differences in performance at the State and Territory level (refer to Table D.10).

**TABLE D.10: TELSTRA'S PERFORMANCE AGAINST THE CSG STANDARD, IN-PLACE SERVICE CONNECTIONS, BY STATE AND TERRITORY, 1998–1999 AND 1999–2000**

	1998-99	1999-2000
QLD	97%	97%
NSW/ACT	97%	97%
VIC	97%	96%
TAS	98%	98%
SA	96%	97%
NT	95%	97%
WA	97%	97%
<b>NATIONAL</b>	<b>97%</b>	<b>97%</b>

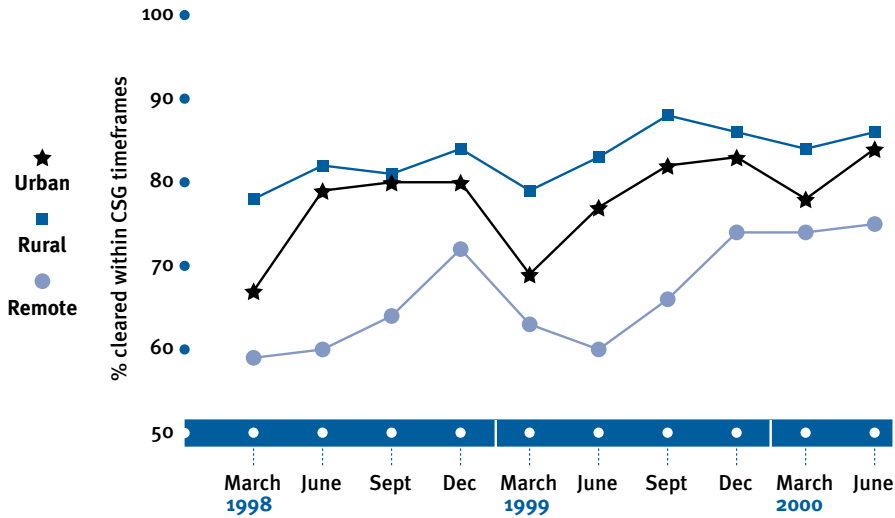
Source: Telstra (adjusted data).

Note: Telstra's performance is adjusted for factors that are outside the control of Telstra and where Telstra has been granted an exemption from the CSG Standard.

## FAULT RESTORATION

Figure D.4 refers to Telstra's performance against the CSG Standard since the March 1998 quarter, at the national level, for the restoration of faults. There were approximately two million faults reported that were subject to the CSG. Telstra cleared a higher percentage of faults within the CSG timeframes in rural areas than urban and remote areas. Performance in rural areas was variable, with between 84 and 88 per cent of all faults being cleared within CSG timeframes for all four quarters of 1999–2000. For the same period in urban areas, between 78 and 84 per cent of faults were cleared, while remote areas experienced the greatest variation, with between 66 and 75 per cent of faults cleared.

**FIGURE D.4: TELSTRA'S FAULT CLEARANCE PERFORMANCE AGAINST THE CSG STANDARD IN URBAN, RURAL AND REMOTE AREAS, MARCH QUARTER 1998 TO JUNE QUARTER 2000**



Source: Australian Communications Authority (unadjusted data).

Telstra's performance in the Northern Territory and in rural and remote areas of Western Australia was significantly below its performance at the national level (refer Table D.11).

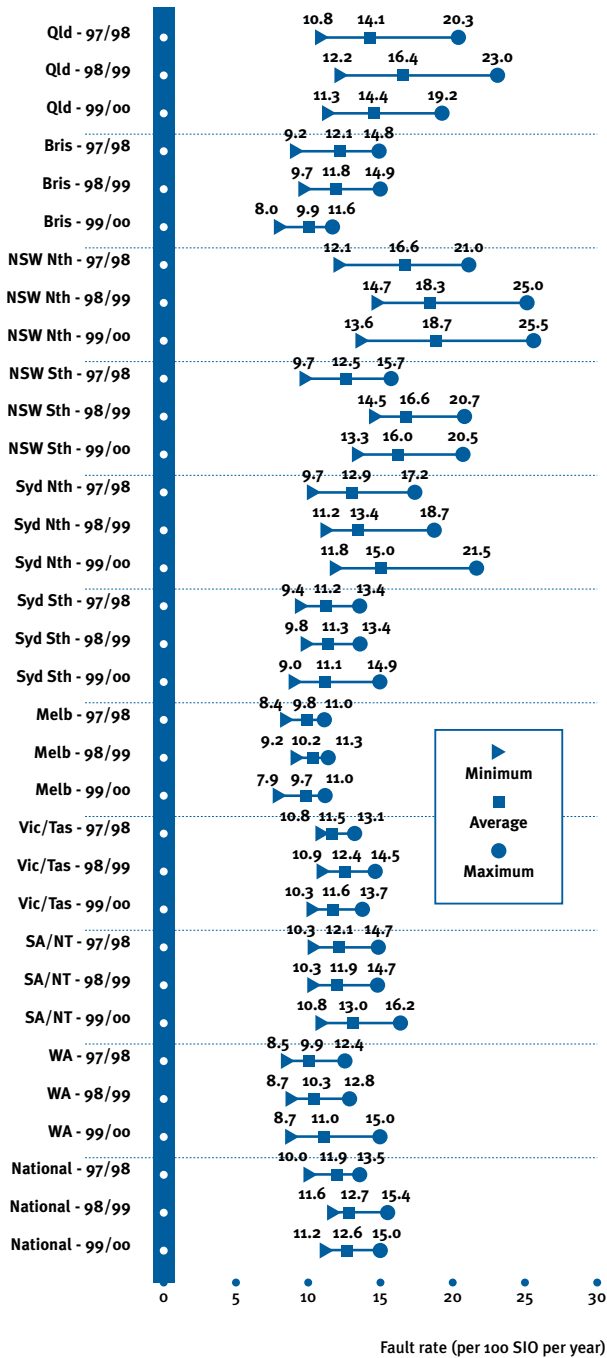
**TABLE D.11: TELSTRA'S FAULT CLEARANCE PERFORMANCE AGAINST THE CSG STANDARD, IN URBAN, RURAL AND REMOTE AREAS BY STATE AND TERRITORY, 1998-99 AND 1999-2000**

	Urban areas		Rural areas		Remote areas	
	98-99	99-00	98-99	99-00	98-99	99-00
QLD	85%	86%	88%	91%	73%	81%
NSW/ACT	78%	82%	82%	87%	77%	86%
VIC	82%	85%	84%	85%	81%	80%
TAS	78%	88%	84%	88%	-	-
SA	82%	79%	93%	89%	76%	75%
NT	68%	74%	76%	79%	53%	61%
WA	78%	84%	71%	78%	55%	57%
<b>NATIONAL</b>	<b>80%</b>	<b>83%</b>	<b>83%</b>	<b>86%</b>	<b>67%</b>	<b>73%</b>

Source: Telstra (adjusted data).

Note: Tasmania has no remote areas as defined under the CSG Standard. Telstra's performance is adjusted for factors that are outside the control of Telstra and where Telstra has been granted an exemption from the CSG Standard.

FIGURE D.5: TELSTRA'S REGIONAL FAULT RATES FOR 1997-98, 1998-99 AND 1999-2000



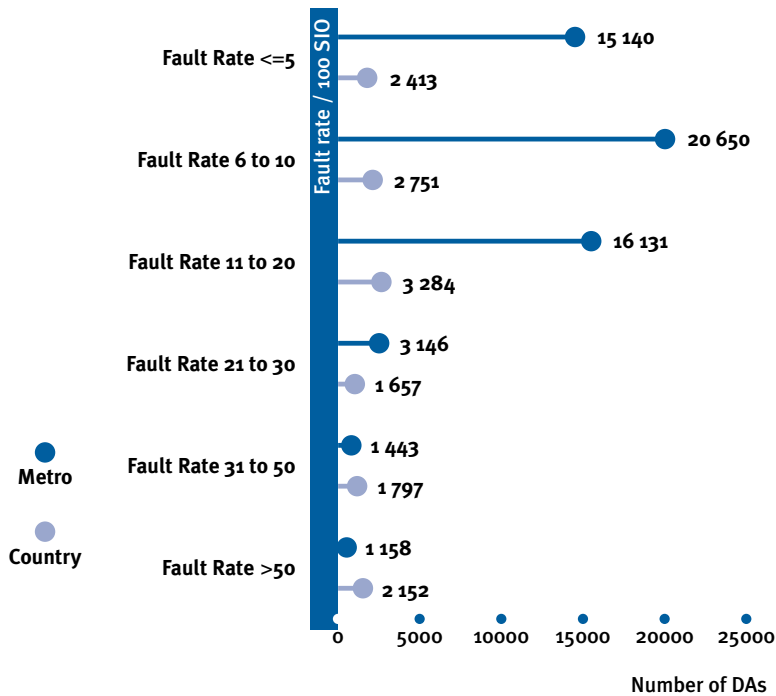
Source: Telstra.

## SERVICE RELIABILITY

The large variation of fault rates in Telstra’s Customer Access Network is reflected in Figures D.5 and D.6. Figure D.5 shows the annualised average, minimum and maximum fault rates per 100 services in operation (SIO) for the years 1997–98, 1998–99 and 1999–2000 in various service areas. Fault rates are particularly high in areas of Queensland outside of Brisbane and for northern and southern New South Wales. For example, fault rates have been as high as 23 per 100 SIO in Queensland in 1998–99 and 25.5 per 100 SIO in northern NSW in 1999–2000.

Figure D.6 shows the number of distribution areas with various fault rates across country and metropolitan areas of Australia during 1998–99. Collectively, 60 300 or 84 per cent of all distribution areas had less than 20 faults per annum. However, of the 14 000 distribution areas within country areas, approximately 5600 or 40 per cent had fault rates in excess of 20 per annum.

**FIGURE D.6: FAULT RATES FOR DISTRIBUTION AREAS — TELSTRA’S CUSTOMER ACCESS NETWORK 1998–99**



Source: Telstra.

Note: A ‘distribution area’ is a customer area fed by a network distribution element such as a pillar, cabinet or main cable direct feed. A distribution area will typically have several hundred services but can range from tens to thousands.



## APPENDIX E – INTERNATIONAL COMPARISONS FOR HIGH SPEED SERVICES

The Communications Research Unit of the Department of Communications, Information Technology and the Arts prepared analyses for the Inquiry of the prices of various high speed services available internationally.

The tables below provide comparisons for ISDN, ADSL, cable modem and satellite services.

**TABLE E.1: INTERNATIONAL COMPARISONS FOR ISDN SERVICES**

Country	ISDN Provider	ISDN Product	Connection \$Aus	Annual Rental \$Aus	Average Annual Fixed Cost \$Aus	Cost for 20 hrs Local Calls \$Aus
<b>Australia (incl GST)</b>						
	Telstra	OnRamp 2	324.50	660.00	768.17	49.94
		On Ramp Home Highway	324.50 (190.30 upgrade of exist. Line)	514.80 (5.50 free calls)	622.97	32.67*
		OnRamp Business Highway	324.50 (190.30 upgrade of exist. line)	792.00 (22.00 free calls)	900.17	27.94
<b>Canada</b>						
	Bell Canada	Microlink ISDN	233.86	1,348.77	1,426.73	0.00
<b>UK</b>						
	BT	ISDN 2e	498.50	1,382.77	1,548.93	120.24
<b>USA</b>						
	Bell Atlantic	ISDN BRI (Maryland)	199.07	831.72	898.08	155.94
	Pacific Bell	Personal ISDN (California)	196.98	694.96	760.62	107.50
<b>New Zealand</b>						
	NZ Telecom	ISDN BRA	136.09	1,045.18	1,090.55	46.66
<b>Singapore</b>						
	Singapore Telecom	ISDN-d-way	0.00	113.68	113.68	15.92
<b>Sth Africa</b>						
	Telkom SA	ISDN 2	104.91	571.39	606.36	52.34

Note: Exact comparisons cannot be made given the differences associated with ISDN packages in different countries.

Telstra's Home Highway service includes untimed local voice calls.

Average Annual Fixed Cost includes Annual Rental plus Connection Costs averaged over three years.

**TABLE E.2: INTERNET ACCESS BY DSL AND OECD MEMBER COUNTRIES, (\$US)**

Country	Company	Connection charge (\$US)	Monthly rental (\$US)	Mbs included	Extra cost per Mb (\$US)	Add. Mthly fees – ISP access &/or set up fees (\$US)	Extra cost for equipment (\$US)	Speed: down/up stream kbits/s)
Australia	Telstra (Blast off)	157.99*	54.60/44.53**	250	11.53***			256/64
	Telstra (Business Standard)	157.99*	61.31/51.24**	500	11.53***			512/128
	Telstra (Business Deluxe)	157.99*	80.83/70.76**	500	11.53***			1500/256
	Telstra (Freedom Standard)	157.99*	57.65/47.58**	AUP#	.			256/64
	Telstra (Freedom Deluxe)	157.99*	64.36/54.29**	AUP#	.			512/128
Austria	Telekom Austria (A-online Speed alpha)	7.04	56.83	1000	0.07	Included		512/64
Belgium	Belgacom – Turbo Line (Plus)	215.93	38.07	3000	0.10	67.89		1000/128
Canada	Bell Canada Sympatico (Bell Sympatico High Speed Edition)	39.56	27.51	Unlimited		Included		
Denmark	TeleDanmark (NetExpress)	216.84	51.91	100	0.03		255.60	512/128
France	France Telecom (Netissimo1)	115.64	39.54	Unlimited		24.62		500/128
	France Telecom (Netissimo2)	147.72	104.45	Unlimited		24.62		1000/256
Germany	Deutsche Telecom (T-Online Speed 100)	149.63	74.56					768/128
Iceland	Iceland Telecom (ADSL 256)	82.16	41.08	1000	0.07	61.62	328.63	256/128
Japan	NTT (Trial)	190.22	40.69			111.67	7.57 /month	512/224
Korea	Korea Telecom	29.04	38.72					128/128
New Zealand	Telecom NZ (Xtra Velocity 1500)	165.83	97.07	1500	0.17	9.76	219.51	
Norway	Telinor	741.54	185.39					640/256
Spain	Telefonica (Terra Familiar)	180.82	44.35				156.94	256/128
	Telefonica (Terra Professional)	249.06	95.3				156.94	512/128
USA	Bell Atlantic (Prof. Infospeed)	99	99.95			Included	350.00	1600/90

Source: OECD (modified by DOCTA CRU). OECD figures as at March 2000 while Telstra figures are August 2000.

Notes: \* Telstra Connection - 3 months = \$243.39; 12 months = \$157.99; 18 months = \$115.29

\*\* Without/with Telstra long distance pre-selection

\*\*\* \$11.53 per Mb up to 5Gb; \$10.68 per Mb after 5Gb

# AUP: Subject to Telstra acceptable use policy

**TABLE E.3: INTERNET ACCESS BY CABLE IN OECD MEMBER COUNTRIES, (\$US)**

Country	Company	Plan	Connection charge (\$US)	Monthly rental (\$US)	Mbytes included	Additional cost per Mbyte (\$US)	Additional mthly cost for cable modem	Speed of connection and upstream (kbits/s)
Australia	Telstra Big Pond	Freedom	61.1	40.7	Unlimited	0	0	400/128
	Telstra Big Pond	Blast Off	61.1	30.83	250	0.15	0	400/128
	Optus@Home	Warp Speed	243	39.01	Unlimited	0		
	Optus@home	Lightening Speed	121	45.72	Unlimited	0		
Belgium	ALE	Economy Pack	70.24	24.14	250	0.14	10.84	
		Family Pack	70.24	38.7	1024	0.14	10.84	
		Power Pack	70.24	111.49	Unlimited		10.84	
Canada	Shaw Communications	Shaw @ Home	118.8	34.4	Unlimited	0	0	
Denmark	TeleDanmark		262.18	12.88			0	512
France	France Telecom Cable (Wanadoo)	Prime@access	80.57	47.75	500	0.37	0	512/128
Ireland	Cablenet	Cable Net Plus	186.4	55.92				256/128
Japan	Titus Communications	ALLNET	208.2	56.78	Unlimited	0	0	512/100
Mexico	InterCable	CableLink 300	64.03	31.91	300	0.15	10.67	
New Zealand	Saturn Communication		146.34	56.07	85.37 worth of traffic	0.17/ Mb intern., 0.017/ Mb national		512/128
Sweden	Tele2		57.49	35.64			9.77	512
Switzerland	Cablecom	Hispeed: BUSINESS	118.6	115.56	2000	0.12	9.12	
UK	NTL	Hispeed	39.86	78.52				
USA	Cablecision Systems Corp.	Optimum online	0	43.95	Unlimited	0		

Source: OECD modified by DOCITA CRU. OECD figures as at March 2000 and Telstra figures as at August 2000.

**TABLE E.4: SATELLITE INTERNET DIRECT TO SUBSCRIBER COMPARISON — JULY 2000 (\$AUS)**

Country	Provider	Product	Connection	Monthly access	Call allowance per month	Additional hours/ Mb costs	Download speed
Australia	Telstra	Basic Sat	\$108.90	\$44.00	250Mb	26.4c per Mb	64 kbps
		Liberty Sat	\$108.90	\$54.95	Unlimited	n/a	64 kbps
		Business Sat	\$108.90	\$60.50	1Gb	26.4c per Mb	400 kbps
		Giga Sat Residential only	\$108.90	\$76.95	3Gb	26.4c per Mb	400 kbps
U.S.	Hughes Corp DirecPC	Executive Surfer	Equipment costs only	\$49.75	25 hours	\$3.30	400 kbps
		Family Surfer	Equipment costs only	\$82.93	100 hours	\$3.30	400 kbps
Canada	Bell Express Vu	Office Surfer	Equipment costs only	\$215.64	200 hours	\$3.30	400 kbps
		DirecPC	\$334.56	\$55.89	60 hours		400 kbps
South Africa	InfoSat	Solo 24	\$726.99	\$72.46	Unlimited		64 kbps
N.Z	lhug Ultra	Swift Satellite	\$115.87	\$46.62	300 hours	\$1.17 per hour	
Europe (Slovakia)	Astra		\$46.64	\$23.32			500 kbps

Sources: Company websites researched by DOCITA CRU.

Note: Currency conversion from Australian Financial Review published 'buy' rate at 30 June 2000, sourced from Westpac 29 June 2000.

Telstra connection fees vary according to location, from \$108.90 for supported self installation up to \$2036 for a remote business installation of a large satellite dish. lhug requires modem connection for upstream access, and local call access is only available from Sydney, Melbourne and Brisbane.

# APPENDIX F—NETWORKING THE NATION AND SOCIAL BONUS PROGRAMS

## PROGRAM ELEMENTS

The Networking the Nation (NTN) program consists of the General Fund, established in 1997 following the sale of the first third of Telstra, and the various parts of the Social Bonus package allocated to NTN resulting from the sale of a further 16.6 per cent of Telstra in 1999.

Under the General Fund, \$250 million was allocated over a five-year period commencing in 1997. Funding was allocated to the States and Territories on the following basis:

- New South Wales—\$37.4 million
- Victoria—\$28.5 million
- Queensland—\$53.1 million
- Western Australia—\$26.5 million
- South Australia—\$26.5 million
- Tasmania—\$58 million
- Australian Capital Territory—\$4 million
- Northern Territory—\$16 million

Further funding initiatives to assist the development of telecommunications infrastructure and services in regional, rural and remote Australia have been established through the Social Bonus package provided through the second partial sale of Telstra. Many of the Social Bonus elements have been added to the NTN fund, including:

- ▶ **Remote and Isolated Islands Fund** (\$20 million over three years)—funding to meet the telecommunications needs of remote island communities;
- ▶ **Internet Access for Regional and Rural Australia** (\$36 million over three years)—Internet access (at least equivalent to untimed local call access) for people in all rural and regional areas;
- ▶ **Building Additional Rural Networks** (BARN—\$70 million)—to support and develop innovative market models for regional communications service delivery;
- ▶ **Local Government Fund** (\$45 million)—to support local government authorities to improve access to local government services online for their communities;
- ▶ **Expanded mobile phone coverage** (\$1 million per State)—in South Australia, Western Australia and Tasmania; and
- ▶ **Connecting Tasmanian schools** (\$15 million)—to support the Tasmanian Government to put their schools online.

Additional funding has been made available under a range of Social Bonus programs which fall outside NTN, to support improvements in regional communications, including:

- ▶ continuous **mobile phone coverage** along designated major highways (\$25 million over three years);
- ▶ **access to untimed local calls** for remote Australians living in extended zones (\$150 million over three years);

- ▶ a **Television Fund** to extend SBS service and enable improved television reception in regional areas (\$120 million over five years);
- ▶ the **Launceston Broadband Project** (\$15 million) involving the establishment of a product development centre in Tasmania, together with a development fund for small businesses and a broadband network in Launceston linking up to 5000 customers; and
- ▶ **Trials in Innovative Government Electronic Regional Services** (TIGERS—\$10 million), to trial a range of innovative means of delivering government services over the Internet, through call centres and over-the-counter facilities (supported electronically) with an emphasis on regional and remote areas.

In addition, \$70 million has been allocated to improve service delivery to small rural communities through the **Rural Transaction Centres Program**, administered through the Commonwealth Department of Transport and Regional Services.

Finally, a key initiative within the Social Bonus which does not specifically target regional communities, but which will provide broad benefits to the information technology and telecommunications (IT&T) sector and users in Australia is the \$158 million **Building IT Strengths (BITS) Program**. The program is designed to address perceived current market failures and promote the growth of new and innovative Australian IT&T businesses. BITS has three main elements: a \$78 million Incubator Centres program to assist IT&T small to medium enterprises; a \$40 million Advanced Networks and Test-beds program; and a \$40 million program aimed at Developing Tasmania as an 'Intelligent Island'.

## NTN FUNDED PROJECTS

As at 29 August 2000, over 400 projects worth approximately \$197 million had been funded through NTN.

Funded projects can be classified under ten categories. Table F.1 shows funded projects categorised by project type and State and Territory, since the inception of the program. Note that as many projects involve a number of elements, the total number of projects and funding amounts are greater than the amount actually allocated.

Projects are categorised as follows:

### **Internet points of presence and/or Internet services**

Projects that provide Internet infrastructure and/or services, including those where ownership of infrastructure and/or provision of services is outsourced to commercial service providers.

### **Video conferencing equipment and/or services**

Projects that provide video-conferencing facilities to the public, or to specific groups, whether or not the project is actually providing services over the video-conferencing facilities.

### **Public access facilities and services**

Projects that are seeking to establish access facilities to online services for the public (excluding video-conferencing), including where the facility is part of a range of other services, such as libraries, telecentres, cybercafes, etc.

**Telecommunications/IT related training equipment and/or services**

Projects that are providing training services specifically related to developing skills in using telecommunications and online services.

**Network equipment and/or services and/or IT products**

Provision of equipment/links/services relating to a telecommunications network (public or private), or to projects seeking to develop, trial or test telecommunications or Information Technology equipment.

**Support services**

Projects that provide technical and other user support services.

**Delivery of online services and information**

Provision of an online service such as telehealth, education online etc. directly to end-users, whether or not they own the equipment through which the online service is provided.

**E-commerce and/or other online service delivery**

Provision of facilities to allow e-commerce or e-business to take place, or to allow other online services to be provided to end-users by service providers. Examples of such projects include those providing secure electronic trading facilities, those providing regional portals or gateways, and those brokering e-business activity through an online system.

**Planning studies and/or development of regional telecommunications strategies**

Development of planning studies, including such activities as telecommunications audit, community consultation, needs analysis, opportunity analysis, demand aggregation and other strategic development.

**Projects to raise awareness**

Raising broad community awareness of the benefits of enhanced telecommunications services and facilities.

**TABLE F.1: NTN FUNDING BY STATE, TERRITORY AND PROJECT TYPE**

	No. Projects	Funding Allocated
<b>Internet points of presence and/or Internet services</b>		
QLD	12	\$8 317 416
NSW	16	\$3 924 857
ACT	–	–
VIC	7	\$8 113 147
TAS	4	\$214 336
SA	7	\$1 953 863
NT	3	\$649 800
WA	4	\$1 806 425
MST	5	\$28 052 000
<b>TOTAL</b>	<b>58</b>	<b>\$53 031 844</b>
<b>Video conferencing equipment and/or services</b>		
QLD	8	\$5 383 815
NSW	5	\$2 143 927
VIC	3	\$1 307 000
TAS	6	\$308 502
SA	10	\$2 193 511
NT	–	–
WA	4	\$867 950
MST	1	\$2 000 000
<b>TOTAL</b>	<b>37</b>	<b>\$14 204 705</b>
<b>Public access facilities and services</b>		
QLD	26	\$10 454 445
NSW	33	\$13 267 594
ACT	2	\$1 140 966
VIC	20	\$6 112 325
TAS	13	\$6 492 849
SA	13	\$2 929 749
NT	–	–
WA	5	\$4 176 152
MST	5	\$5 430 000
<b>TOTAL</b>	<b>117</b>	<b>\$50 004 080</b>



	No. Projects	Funding Allocated
<b>Telecomms/IT related training equipment and/or services</b>		
QLD	17	\$7 846 511
NSW	37	\$8 191 769
ACT	2	\$1 170 326
VIC	19	\$5 745 139
TAS	5	\$2 120 907
SA	4	\$529 415
NT	7	\$1 907 554
WA	7	\$845 152
MST	5	\$3 913 000
<b>TOTAL</b>	<b>103</b>	<b>\$32 269 773</b>

<b>Network equipment and/or services and/or IT products</b>		
QLD	5	\$351 000
NSW	7	\$1 591 328
ACT	–	–
VIC	6	\$5 914 907
TAS	6	\$1 488 062
SA	5	\$3 286 144
NT	2	\$3 375 000
WA	10	\$10 886 334
MST	4	\$5 546 000
EXT	1	\$199 000
<b>TOTAL</b>	<b>46</b>	<b>\$32 637 775</b>

<b>Support services</b>		
QLD	4	\$1 227 435
NSW	6	\$3 109 978
ACT	2	\$1 170 326
VIC	5	\$2 300 000
TAS	7	\$7 133 226
SA	2	\$221 513
NT	3	\$670 250
WA	1	\$370 000
MST	5	\$2 856 500
<b>TOTAL</b>	<b>35</b>	<b>\$19 059 228</b>

	No. Projects	Funding Allocated
<b>Delivery of online services and information</b>		
QLD	7	\$3 570 280
NSW	9	\$3 259 815
ACT	2	\$1 140 966
VIC	5	\$1 881 275
TAS	18	\$12 640 288
SA	6	\$1 670 066
NT	1	\$186 250
WA	3	\$8 983 275
MST	2	\$5 620 000
EXT	1	\$80 000
<b>TOTAL</b>	<b>54</b>	<b>\$39 032 215</b>
<b>E-commerce and/or other online service delivery</b>		
QLD	7	1 857 301
NSW	11	3 600 065
ACT	1	300 000
VIC	5	2 170 000
TAS	13	14 301 867
SA	3	330 600
NT	–	–
WA	3	1 391 000
MST	5	4 101 800
EXT	–	–
<b>TOTAL</b>	<b>48</b>	<b>28 052 633</b>
<b>Planning studies and/or develop regional telecomms strategies</b>		
QLD	9	\$1 726 058
NSW	21	\$1 790 990
ACT	2	\$374 360
VIC	13	\$1 575 740
TAS	6	\$6 940 000
SA	11	\$590 000
NT	3	\$150 000
WA	5	\$277 000
MST	7	\$1 230 000
EXT	1	\$80 000
<b>TOTAL</b>	<b>78</b>	<b>\$14 734 148</b>

	No. Projects	Funding Allocated
<b>Projects to raise awareness</b>		
QLD	7	\$2 878 998
NSW	43	\$8 703 224
ACT	3	\$1 470 326
VIC	13	\$5 841 800
TAS	11	\$8 530 211
SA	2	\$462 500
NT	–	–
WA	2	\$747 000
MST	12	\$4 382 040
EXT	–	–
<b>TOTAL</b>	<b>93</b>	<b>\$33 016 099</b>

Note: MST refers to M projects covering multiple States/Territories;  
EXT refers to Australia's External Territories.

# GLOSSARY OF TERMS



## A

### **ACA Australian Communications Authority**

Commonwealth regulatory authority for telecommunications and radiocommunications.

### **ACCC Australian Competition and Consumer Commission**

Commonwealth regulatory body with responsibilities derived from the *Trade Practices Act 1974* and other telecommunications-specific legislation, with competition and trade practices responsibilities in relation to the telecommunications industry.

### **ACE Australian Communications Exchange**

The current National Relay Service provider.

### **ACIF Australian Communications Industry Forum**

Established in May 1997 as a communications industry self-regulatory body. ACIF is responsible for developing industry codes and standards and service specifications.

### **ADSL Asymmetrical Digital Subscriber Line**

A compressions technology for transmitting combinations of services (voice, data and one-way full motion video) at high speeds over existing copper feeder, distribution and subscriber lines. ADSL is asymmetric—it uses most of the channel to transmit downstream to the user and only a small part to receive information from the user.

### **AMPS Advanced Mobile Phone System**

The analogue mobile phone service, 80 per cent of the network was closed on 1 January 2000, a further 15 per cent was shut down on 30 June 2000, and the remaining five per cent will be closed on 3 October 2000.

### **ATIA Australian Telecommunications Industry Association**

Australia's peak industry association representing local and international companies engaged in the design, development and production of telecommunications products and systems in Australia.

### **ATM Asynchronous Transfer Mode**

A high bandwidth, low-delay, packet-based switching protocol that allows voice, video, text and data to be multiplexed together into a single transmission network with different qualities of service.

### **ATUG Australian Telecommunications Users Group**

A not-for-profit, membership-based organisation with Branches across Australia which seeks to represent the communication needs of business users to Government, Parliamentary members, regulators, carriers, service providers and industry suppliers.

### **AUSTEL Australian Telecommunications Authority**

The telecommunications industry regulator until 30 June 1997.

## B

### **Backbone network**

Trunk or inter-exchange network.

### **Bandwidth**

Measure of throughput capacity of a given communications network link or transmission protocol.

### **BARN Building Additional Rural Networks**

A program administered by Networking the Nation and funded from the sale of the second tranche of Telstra shares.

### **BITS Building IT strengths**

A Social Bonus initiative arising from the second partial sale of Telstra.

### **bps bits per second**

A common measure of data speed for transmission carriers. The speed in bps is equal to the number of bits transmitted or received each second. Larger units are often used to denote high data speeds for example, kbps (kilobits per second) = one thousand bits per second; mbps (megabits per second) = one million bits per second; gbps (gigabits per second) = one thousand million bits per second; and tbps (terabits per second) = one million million bits per second.

### **Broadband**

A communications technique using high frequency transmission over a coaxial cable or optical fibres. It can transmit large amounts of data, voice or video over long distances.

## C

### **CAN Customer Access Network**

The network sometimes referred to as the 'local loop' consisting of the customer telephone attached to a local area switch which is mainly comprised of copper cable but may use wireless or satellite technologies.

### **Call congestion**

The failure by a telecommunications network to accept a bid to establish a call. This becomes apparent to an originating caller by a tone heard after the number has been called, known as *fast busy* tone. Callers to a mobile phone can encounter congestion for the same reasons, but they normally receive a recorded voice announcement.

### **Call drop-out**

The unintended disconnection of a call either by a mobile handset (usually owing to a fall in the strength of the radio signal) or on a fixed line modem connection (i.e. the Internet). The likelihood of call drop-out can be influenced by reflections and shadowing by physical features such as high rise buildings, by the size of the customer base at any particular time in a mobile service area, and by some aspects of customer usage of equipment.

### **Carrier**

The holder of a telecommunications carrier license in force under the *Telecommunications Act 1997*.

### **CDMA Code Division Multiple Access**

An access technique for digital wireless communications including mobile phone and satellite services. The technique employs a bandwidth much larger than the original signal. Each signal is uniquely encoded and decoded, and in this way many signals can occupy the same spectrum.

**Communications satellite**

A radio relay station in orbit above the Earth that receives, amplifies and redirects radiocommunications signals. There are a number of orbit types, including geostationary, low Earth orbit and medium Earth orbit.

**Coverage area**

A geographic area in which calls are able to be made on a mobile phone. Coverage can be increased by installing radio base stations in new areas or by installing equipment which can effectively extend the range of coverage.

**CRU Communications Research Unit**

An economic research branch within the Department of Communications, Information Technology and the Arts providing a research program for the Department and a consultancy research service to external clients.

**CSG Customer Service Guarantee**

A standard that has been operating since 1 January 1998 which was replaced by a revised standard on 7 July 2000. The standard requires phone companies to meet minimum standards and for customers to receive financial compensation where performance requirements are not being met. The CSG covers the supply of standard telephone services. It also covers some enhanced call features.

**CSP Carriage Service Provider**

A person who supplies, or proposes to supply, certain carriage services, including a commercial entity acquiring telecommunications capacity or services from a carrier for resale to a third party. Internet and pay television service providers also fall within the definition of carriage service providers under the *Telecommunications Act 1997*.

**CWO Cable and Wireless Optus**

Licensed carrier, previously named Optus Communications.

**D****Datacasting**

A type of wireless data transmission involving services which are delivered on frequencies which can be accessed by consumers through television sets and receiving antennae.

**Dark fibre**

Optical fibre infrastructure that is currently in place but not in use. As optical fibre conveys information in the form of light pulses, 'dark' means that no light pulses are being sent.

**DDSO Digital Data Service Obligation**

An obligation to ensure the availability of data services operating at a specified minimum speed (around 64 kbps).

**DOCITA Department of Communications, Information Technology and the Arts**

Commonwealth Department responsible for communications policy.

**DRCS Digital Radio Concentrator System**

A solar power communications system designed by Telstra for voice and very low speed data applications in remote areas. It is an ageing technology and is currently being replaced under Telstra's Remote Areas Telecommunications Enhancement program (RATE) with High Capacity Digital Radio Concentrator Systems (HCRC).

**DSL or xDSL Digital Subscriber Line**

A technology that enables the copper telephone network to carry data-streams of up to 6 mbps. The 'x' denotes that there is more than one DSL technology (e.g. ADSL and VDSL).

**DWDM Dense Wavelength Division Multiplexing**

A technology that puts data from different sources together on an optical fibre, with each signal carried on its own separate light wavelength. Using DWDM, up to 80 (and theoretically more) separate wavelengths or channel of data can be multiplexing into a lightstream transmitted on a single optical fibre.

**E****Easycall™**

Telstra product for a range of exchange-based enhanced call handling facilities.

**Exchange**

Network node where various numbers and types of communication lines are switched by the telecommunications user or network operator. Exchanges operate at local, trunk and international levels.

**Extended Zones**

The charging zones for remote areas of Australia. There are 111 Extended Zones covering approximately 80 per cent of the Australian landmass and containing approximately 40 000 subscribers in total.

**F****Frame relay**

A telecommunication service designed for data transmission for intermittent traffic between local area networks and between end-points in a wide area network. Frame relay puts data in a variable-size unit called a frame and leaves any necessary error correction up to the end-points, which speeds up overall data transmission. For most services, the network provides a permanent virtual circuit which means that the customer sees a continuous, dedicated connection without having to pay for a full-time leased line. Meanwhile, the service provider determines the route each frame travels to its destination, and can charge based on usage.

**G****GEO or GSO Geostationary Earth orbit or geostationary orbit**

Communications satellites used for both broadcasting and telecommunications services in orbit 36 000 kilometres above the Earth's equator, with a rotation period nominally of 24 hours. It thus appears stationary over any location on the Earth.

**GPRS General Packet Radio Service**

A packet based data protocol for mobile phones that overlays GSM networks. GPRS differs from standard GSM data services in that it enables faster data rates (up to 115 kbps compared with 9.6 kbps) and enables data to be sent in discrete packets.

**GSM Global System for Mobile Communication**

A digital cellular telecommunications standard used by many countries.

## H

### **HFC cable Hybrid Fibre Coaxial cable**

A network consisting of optical fibre on main routes, and supplemented by coaxial cable closer to the customer's premises.

### **HREOC Human Rights and Equal Opportunity Commission**

Administers Federal legislation in the area of human rights, anti-discrimination, social justice and privacy.

## I

### **ISDN Integrated Services Digital Network**

A digital access technique, for voice and data. It is a digital alternative to an analogue public switched telephone service.

### **ISP Internet Service Provider**

A service provider offering Internet access to the public or another service provider.

### **ITU International Telecommunications Union**

An agency of the United Nations established to promote international cooperation in telecommunications. It establishes standards and recommends regulations.

## L

### **LEO Low Earth Orbit**

A non-geostationary—typically polar—orbit used by satellites at an altitude no more than 1500 kilometres above the Earth.

### **LMDS Local Multipoint Distribution System**

Microwave broadband point-to-multipoint radiocommunication services that are capable of delivering a range of basic and advanced broadcasting and telecommunications services. These services include wireless pay TV (or alternative to cable TV); two-way interactive video communications; high speed data including Internet; telemedicine; teleconferencing; telecommuting; other multimedia; support cable networks and 'off air' programming; and telephony.

## M

### **MEO Medium Earth Orbit**

Communications satellites in orbit 10–20,000 kilometres above Earth.

### **MMDS Multichannel Multipoint Distribution System**

A wireless system which has historically been used to deliver one-way pay television broadcasts but is now seen as a way to provide advanced two-way digital broadband access.

### **Modem**

A device that converts digital data into analogue data for transmission on narrowband networks such as telephone lines to another modem. The data is then converted back into digital data to be processed by the receiving computer.



**NTN Networking the Nation**

A Commonwealth grants program providing funding to not-for-profit organisations to support activities and projects designed to address a range of telecommunications needs in regional, rural and remote Australia.

**NRS National Relay Service**

A service providing people who are deaf or who have a hearing or speech impairment with access to the standard telephone service through the relay of voice, modem or telephone typewriter communications. It operates as a translation service between voice and non-voice users of the standard telephone service, and is currently provided by the Australian Communications Exchange.

**P****Packet**

In a packet-switched network such as the Internet, data is packaged and routed in 'blocks' or packets, each having a header with the network destination address.

**Pair gain system**

A transmission system that uses concentrators or multiplexers so that fewer wire pairs may be used than would otherwise be required to provide service to a given number of subscribers.

**POP Point of Presence**

A geographic location where a CSP (including ISPs and some other CSPs) can be accessed by a customer. Whether the nearest point of presence is within a customer's local call area (a local POP) is related to the cost of accessing the service. Normally used in relation to services requiring dial-up access to the Internet.

**PSTN Public Switched Telephone Network**

The part of the telecommunications network which enables any customer to establish a connection for voice communication with any other customer either automatically or with operator assistance.

**R****Roaming**

A mobile communications service which allows subscribers to use their cellular telephone in the area of another carrier.

**S****SDH Synchronous Digital Hierarchy**

A standard technology for synchronous data transmission on optical media.

**Service area**

A geographic area in which radiocommunications services, e.g. mobile phone or broadcast, are planned to be available.

**Social Bonus**

Government financial assistance for communications projects from the proceeds of the sale of the second tranche of Telstra shares.

**STS Standard Telephone Service**

Provides a voice telephony service or an equivalent service to meet the requirements of the *Telecommunications Act 1997* and the *Disability Discrimination Act 1992*.

**2G 2nd generation**

Existing narrowband digital mobile phone systems providing voice and data messaging.

**T****3G 3rd generation**

High capacity digital mobile phone systems which will offer services such as voice, Internet and real time video, operating on terrestrial and satellite based networks.

**TIO Telecommunications Industry Ombudsman**

An industry-funded independent dispute resolution service established in December 1993, for consumers unable to resolve complaints with their telecommunications carrier or carriage service provider.

**TTY Telephone typewriter**

Equipment used for communication with people who are deaf or who have a hearing, speech or communication impairment. Communication is typed after the call is connected.

**U****USO Universal Service Obligation**

The obligation under the Telecommunications (Consumer Protection and Service Standards) Act 1999 to ensure that standard telephone services, payphones and prescribed carriage services are reasonably accessible to all Australians on an equitable basis, wherever they reside or carry on business.

**USO contestability**

The opening to competition of rights and obligations associated with being a universal service provider.

**USP Universal Service Provider**

A carrier responsible for fulfilling the universal service obligation.

**V****VoIP Voice over Internet Protocol**

Voice communication transmitted via the Internet.

**W****WAP Wireless Application Protocol**

A set of protocols which standardise the way in which wireless devices, such as mobile telephones, can be used for Internet access.

**Web browser**

A program specifically designed for navigation of the Internet, including the World Wide Web.

**WLL Wireless Local Loop**

Technology using radio transmission, rather than wire or coaxial cable, to provide connection between a handset (fixed or mobile) and a telecommunications base station or network. Particularly suitable for use in large facilities (such as airports or military bases) or in regional areas.





