

# 30 Years After Launch

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### Abstract

This year is the 30th anniversary of Telecom Australia's launch of the cellular mobile service in Australia. There has been a huge evolution in mobile services since then. The Postmaster-General's Department (PMG) introduced a manually (operator) connected mobile service in Australia in 1950. As this service approached full capacity, Telecom launched a Public Automatic Mobile Telephone Service (PAMTS) in 1981. The PAMTS service had no future technology evolution, a 12 year life, and reached a peak of 14,000 customers. By 1985 a small engineering team had developed a cellular mobile service concept based on the Analogue Mobile Phone Service (AMPS) standard. Development was accelerated and refined and the service was launched in 1987, arguably two and perhaps three years late. This is the story of the development and launch of the service and the growth over the first four years to 1991. Noting the experience of cellular operators in the USA, Canada and the UK, Telecom's mobile service concept was a "gold standard" for cellular services around the world, and the service achieved one of the fastest growth rates in its early years. Within four years it was a cash flow powerhouse, and one of only three services within Telecom that were profitable; the others were the basic telephone service and directory publishing. When transferred to Telstra in 1992 it was a strategically strong, highly profitable business prepared to defend against competition being introduced into the Australian telecommunications market, and was a foundation of Telstra's financial strength for the next 30 years.

## Introduction

In 1974 the Vernon Royal Commission of Inquiry into the Post-Master General's Department (PMG) recommended to the Whitlam Labor Government that the PMG be split into two businesses, the Australian Telecommunications Commission (Telecom Australia) and the Australian Postal Commission (Australia Post). Each business was to be operated using "commercial business principles", with personnel and other employment policies, including industrial relations, suited to the new business and independent of the Public Service Board.

The new Telecom was designed and implemented in 1975 by senior managers transferring from the PMG. Key recommendations of the Vernon Report were not implemented; for example, the new district organisation was based on state boundaries rather than on commercial criteria; the one senior manager appointed from the private sector had little commercial experience; and the personnel and other employment policies, processes, and culture of the public service were retained. From 1975 until 1989, except for a brief period, there was only one senior manager in Telecom who had significant commercial, private sector experience.

The resulting business was minimally commercial in organisation, skills, focus, priorities and processes. Telecom, with its monopolies, union constraints and public sector legacy, preferred change on its own terms with minimal risk; it was familiar with managed technical change but not commercial change.

This background is crucial to understanding Telecom's approach to the introduction of mobile services in Australia.

The Australian Telecommunications Act 1975 required Telecom to "best meet the social, industrial and commercial needs of the Australian people for telecommunications services" and "make those services available throughout Australia for all people who reasonably required those services", including "the special needs for telecommunications of those who resided or carried on business outside the cities". The Act introduced the concept of a "Universal Service" – the provision of a baseline telephone service to every resident and business in the nation at a minimum quality of service at affordable nationwide rates. This meant that rates charged for the telephone service would be the same for customers in urban, rural and outback areas, even though the telephone service outside the cities and major towns operated at a loss.

To finance the cross-subsidy the regulated monopolies enjoyed by the PMG were continued for Telecom: building and operating the national telecommunications network (including mobile networks) and the sale, rental and maintenance of certain customer premises equipment, providing a market share approaching 90%. More transparent forms of funding the cross-subsidy were overlooked, the main aim appearing to be to reassure Telecom's management, staff and unions so that there was a smooth transition from the PMG to Telecom.

The new Telecom was a massive business. It was the largest capital enterprise in the country with assets almost double those of Australia's biggest private company, BHP. In the first year revenue was \$1.4 billion, profit was \$152 million and there were over 87,000 employees.

## Disclosure

This is not an academic paper; a more apt description would be a reflective recollection of the early years of the cellular mobile service in Australia.

The paper is supported by a number of records from the period, including business plans, business cases and trading statements, as listed under "References". The records are incomplete but are sufficient to support the points made. A number of these records no longer exist or are not easily accessible, such as those in the archives of the Australian Telecommunications Commission and Telstra.

Opinions and judgments about Telecom are expressed using standard private sector criteria including growth, market share, customer service and profit, rather than using public service criteria.

The paper provides some detail about Telecom's task as the national carrier and its operations and culture to afford a better understanding of judgements and events. Other mobile services are mentioned as a context for the cellular mobile service.

# Telecom in 1981

1981 seems to have been a pivotal year for Telecom; pressure was building for relaxation of Telecom's monopolies and Telecom launched a new mobile service.

During the first six years Telecom's business was booming; the annual growth rate from 1975 ranged from 8 to 13%, and 14% in the last year to \$2.6 billion. Telephone services had increased from 3.7 million to 5.1 million. Almost 80% of homes in Australia now had phones, up from 62% in 1975.

In 1975 the public network primarily carried voice traffic, but by 1981 a major data market and a value-added services market began to emerge.

Even with its monopoly advantages, Telecom faced a number of huge challenges in the early years. For example, a new national district organisation with some 83 districts was implemented throughout Australia in the first three years. A new computer-based District Customer Record Information System (DCRIS) for processing telephone service transactions was being deployed in the districts, converting over three million paper-based telephone customer service records to the new system by 1985. Emerging technologies, particularly digitisation, optic fibre and computer controlled exchanges, offered a wider range of services and significantly lower capital and operating costs. Government and business networks were growing in size and complexity.

It was clear that Telecom's introduction of new products and services and modernisation of the network were falling behind, particularly in mobile and data services.

Aggressive and massively damaging industrial action taken by the Australian Telecommunications Employees Association (ATEA) in 1978 angered many in government, commerce and industry, and action threatened again in 1981.

By 1981 there was mounting pressure for competition in Australia's telecommunications market. Large businesses were demanding relaxation of Telecom's monopolies, full access to the customer premises equipment market and the right to provide network services.

In short, in the six years since Telecom was formed, not only had the market changed radically, but technology and other factors, including industrial action, seemed to make the relaxation of Telecom's network and permitted attachments monopolies almost inevitable.

## The Davidson Inquiry

In response to the calls for telecommunications de-regulation, in 1981 the Fraser Coalition Government commissioned an inquiry into 'Telecommunications Services in Australia' - the Davidson Inquiry - to determine the desired level of involvement of the private sector in the delivery of existing and proposed telecommunications services, including "value added" services.

In 1982 Davidson recommended far-reaching reforms in Australia's telecommunications market. Five of the most important were: permitting independent networks with no restriction on use; networks based on Telecom's leased lines; resale of capacity leased from Telecom; the interconnection of private networks with Telecom's network; and introducing full competition for marketing and maintenance in the terminals and the value-added services markets. An independent regulator would approve attachments to the network.

It is interesting that Davidson appears to have considered landline and mobile networks together, although satellite networks are mentioned separately.

The Davidson Report raised some of Telecom's worst fears. Telecom had minimal commercial capability and no sales capability. Competition, depending on the form and timetable, foreshadowed a rapid decline in market share. Deregulation of the telecommunications market in the USA indicated that Telecom could conceivably lose over 30% of its market share within a decade.

In March, 1983, the incoming Hawke Labor government shelved almost all of Davidson's recommendations except for some relaxation of the regulation of customer premises equipment.

This at least provided some time for Telecom to become more competitive.

# Telecom's Entry to Australia's Mobile Services Market

In 1950 the PMG launched a manually (operator) connected mobile telephone service using base stations serving a large area. This system had a very limited capacity, allowing only hundreds of services in a city, and there was a long waiting list for connection. The car- or truck-mounted mobile telephones were made locally by Amalgamated Wireless Australia (AWA), were very large and heavy, and coverage was limited. Towards the late 1970s demand was expected to exceed the capacity of the service.

At the same time first-generation cellular mobile technology (1G) emerged, which made mobile communications practical for mass markets; the first commercial service was launched by Nippon Telephone and Telegraph (NTT) in Tokyo in 1979. Pressure was mounting on Telecom, with its monopoly for public services, to provide a superior automatic telephone service which would support the growing mobile market.

1G cellular systems such as the USA's Advanced Mobile Telephone System (AMPS) and the Nordic Mobile Telephone System (NMT) were proposed within Telecom but were not commercially available. AMPS was first launched in Chicago, Illinois, in 1979, and NMT in Finland, Sweden, Denmark and Norway in 1981.

After calling for tenders in 1978, Telecom selected a system supplied by the Nippon Electric Company (NEC) for which the network and mobile equipment was locally assembled. Named PAMTS ? Public Automatic Mobile Telephone System ? the system and mobiles were based on a system supplied by NEC to Nippon Telephone & Telegraph (NTT) and other markets such as Hong Kong. The design of the PAMTS system was not cellular in that channel frequencies were not reused in an area, although a call could be handed over slowly from one base station to another as the mobile moved around the coverage area.

The PAMTS system was launched in August, 1981, in Melbourne with just three base stations, and was rolled out to Sydney, Brisbane, Perth, Adelaide and the Gold Coast. The number of customers reached a peak of 14,000 before gradually declining following the launch of the "true" cellular service, and was finally closed in 1993.

PAMTS mobile units were usually mounted in cars and, weighing 9 kg, were only nominally mobile. The mobile units cost \$4,999 (equivalent to around \$18,000 in 2016) to buy and \$1,000 per year (\$3,500/2016) to rent. The initial connection fee was \$350 (\$1,200/2016), a typical installation cost \$150 (\$500/2016), and the annual network access cost was \$800 (\$3,000/2016). All calls were at Subscriber Trunk Dialling (STD) timed rates with a minimum cost, including for local calls, of 39 cents per minute (\$1.40/2016). With the monopoly, Telecom was the only provider for the service and the only installer in cars and trucks.

The PAMTS system had several serious shortcomings. The technology was obsolete when launched and had no future evolution. The number of customers it could serve was limited and, after 1983, was far less than the scale of market demand emerging for 1G services elsewhere. PAMTS customers were not offered the rapid fall in mobile terminal prices with the escalating volumes experienced in 1G markets after 1984.

The delay until 1987 for the launch of a 1G service in Australia was costly to Telecom and the nation. The number of cellular mobile services in operation in 1990 was 200,000 and in 1993 915,000. If the service had been launched in 1984 or 1985, two or three years earlier, the benefit to the economy and the customers would have been very substantial, perhaps exceeding \$400 million in revenue to Telecom and several times more in economic activity in Australia.

## Telecom's Cellular Mobile Service

By 1982 the progress in places such as the USA, the Nordic countries, Japan and Hong Kong clearly demonstrated the scale of demand and profitability of cellular mobile services.

By 1985 the Australian market was well aware of the popularity of the cellular service overseas and there was mounting pressure for a similar service in Australia, particularly from the business sector. The potential profits from cellular services in Australia were too high for the private sector to be excluded for long. By 1985 a small engineering team in Telecom had developed a limited cellular mobile concept based on the AMPS standard. In the following two years this was accelerated and refined and the service was launched in 1987, arguably two and

possibly three years late.

## The (Cellular) "Mobilenet" Service Concept

Telecom's Commercial Services people had extensively researched two broad models for cellular network services overseas; the European model and the US model.

The European model was a "national" service similar to that adopted in Australia ? see later ? and contrasted with the "regional" US model which is outlined below. The US research was supplemented by other studies such as the Coopers & Lybrand study ? see later.

With this information, the concept designed for Telecom's Mobilenet service for Australia was substantially superior to that operating in the USA and most other advanced economies.

For example, the US market was divided into service regions with two operators in each of more than six regions; a "wireline" mobile carrier associated with the landline operator competing with a "non-wireline" mobile carrier. This fragmentation of the market and other aspects of the service caused customers to have such serious concerns about the cost, markedly hindering take-up and usage.

For example, many customers left their mobile phones "off" as some incoming calls would be billed to the receiver; a customer of mobile operator "X" receiving a call from a customer of mobile operator "Y" was billed by the "X" operator for the component of the call from the "X" base station to the receiver. Customers also were also concerned about the very high cost of roaming between service providers. For example, a customer of mobile operator "X" making a call outside the home territory of operator "X" paid a very high premium. The roaming "surcharge" could be up to 80% of the call cost, and particularly deterred the business people who travelled frequently outside a home territory. Both the receiver and roaming factors resulted from the fragmented market structure and because the billing method was convenient for the carriers and increased carrier revenues.

Typically US mobile operators charged calls on the radio occupancy time (or "airtime") rather than connect time; the charging increment was in expensive 60 seconds rather than 30 seconds or less; and voicemail was usually charged for all components including mailbox occupancy and calls.

**Mobilenet was established as a "national" network** rather than the US "regional" concept, with a national call structure, no roaming fee, and a "customer friendly", simple and low cost billing system for settlements between carriers when competition was introduced. This approach encouraged growth and was, as intended, difficult for a future regulator to unwind when considering alternative models for competition.

**The caller always paid for the call to completion, as for the landline network.** This removed one objection in the US to buying the service, encouraged calling by leaving the handsets on, and consequently increased calls and call revenue.

**The call structure was simple, easily understood and customer friendly.** All calls were timed and there were three calling zones across the Australia ? local, medium distance and long distance. In the USA there were many cellular operators, two in each service area, and each had different and relatively complex call rates.

**Billing was based on connect time** ? the time the call was connected ? rather than the longer radio "air time". In the USA the call was charged on the "radio time" which, depending on the length of the call, could be up to 10% higher.

**Charging was in 30 second charging increments,** rather than the more expensive 60 seconds.

**The mobile voice mailbox was free.** This ensured that almost every call made was completed and billed, regardless of whether the call was answered. The called party then could then make another billable call to the mailbox service, and perhaps another call again as a result.

This "generous" customer oriented concept may appear altruistic to a predatory marketer, but it appears to have been a key factor in the rapid growth of the service and set the standard for when competition arrived.

# Some Other Marketing Issues

The business strategy was to drive growth to the limits and prepare for competition. The strategy addressed perhaps three main marketing issues beyond the service concept: the objections to buying the service, systems and distribution.

While the service concept was similar to those used in Europe, the strategy and marketing plans were based on the highly competitive US market.

The main objections to buying the service were the high prices of the handsets, the bulk and weight of the ?portable? handsets, and the short battery life of the "portables".

The prices of the handsets were high, as much as five times today's prices; about \$1,500 (\$3,500/2016) for the vehicle-mounted model, \$2,500 (\$5,500) for the ?heavy duty? shoulder-carried ?portable? model, and \$4,000-5,000 (\$9,000-12,000) for the so-called portable model (the "Brick"). The shoulder-carried portable model weighed almost 20 kilograms and both the shoulder and fully portable models were bulky, heavy and had a relatively short battery life. Clearly a selling story had to be developed for each market segment ? say early adopters, trades people, and business people ? which promoted the benefits sufficient to overcome the price, bulk, weight and battery life objections.

A second serious problem was the mobile mainstream computer system for sales, order processing, activation, fault reporting and service restoration, billing, collections, customer service and customer data management. The Telecom order processing system (DCRIS) and the Customer Automatic Billing System (CABS) were too basic to be modified to match the capabilities of mobile systems already operating in the USA and Canada. Research of the mobile systems available around the world, particularly in the competitive mobile markets including those used by AT&T, GTE and Bell Canada, found that the most advanced system was that recently installed by Bell Canada called RACE (the meaning of the acronym is not known). The system was superior to any Telecom might adapt, appeared to be easily modified to requirements in Australia, and was likely to be competitive until at least 1992.

The system offered all of the required components of a mobiles system in a competitive market. Crucially important, it allowed access, equipment and call packages to be introduced quickly as conditions changed in the market, fast changes in call charges, and would support the very high growth rates expected for the mobile service. It could also produce bills in different formats for third parties such as distributors and agents. The US experience was that as much as 60% of services could be sold by these outlets, and airtime resale could be required by an Australian regulator when appointed.

RACE was years ahead of other similar systems in Telecom, and was the first ?product? system in Telecom to provide all of the product functions in one suite. Unlike the DCRIS/CABS option, it did not use scarce Telecom systems people who were needed for other urgent systems development in Telecom.

A problem was that RACE was yet another mainstream computer system in Telecom ? others included DCRIS/CABS, directory publishing, and DDS/AUSTPAC (for data). Until RACE was replaced by a superior Telecom system or CABS was modified, customers would receive at least two bills ? one for the fixed telephone service and one for the mobile service (and possibly another for data) ? initially printed in slightly different formats.

The conversion to Telecom?s requirements and installation was completed on time and slightly over budget, which was an unusually good result for computer systems development of this scale in Telecom or any business at that time.

## The Strategic Assumptions for the Cellular Service

Noting the narrow escape from network deregulation after the Davidson Inquiry in 1983, the limitations of the PAMTS system in the market, and the how far behind Telecom was in deploying a cellular service, a number of strategic planning decisions were made to design, launch and rollout a cellular service in Australia.

Observations of the mobile market in the USA and strong business contacts with a number of landline and mobile

operators in the USA ? including AT&T, some of the Regional Bell Operating Companies, (Southwestern Bell Mobile and Bell Atlantic Mobile), GTE and GTE Mobile ? concluded that the US mobile market was one of the most intensively competitive globally, ranking with such as Hong Kong and Japan.

Based on this, the strategic assumption adopted in 1985 was that the high level of competition in the USA would likely influence the Australian Government to adopt a similar regulatory model for Australia ? a duopoly ? and a competitor using technology and experience from the USA would enter the cellular mobile market in Australia in five years ? that is, by 1990.

Put another way, Telecom had five years to build and operate a cellular service which was sufficiently strong to hold, say, 70% of the market after five years of competition.

## The Drive for Competitiveness

In 1985, ten years after its creation as a separate business entity, Telecom was still basically a public service business totally unprepared for any competition, and competition was now assumed to arrive in 1990.

To achieve a rapid network coverage and quality, build a mobile business which would thrive against a competitor and perform at "best practice levels" within five years was a huge task. Mobiles staff were untrained and inexperienced in every business function except engineering, and most, even the engineers, were afflicted with the Telecom culture of complacency.

How would Telecom establish this strong market position, match a competitor, and at the same time try to negotiate a regulatory framework with as few imposed disadvantages as possible within five years?

The strategic approach was to understand what a competitive market would look like in five years, what would be the likely tactics used by competitors, and at the same time, what was world benchmark performance. This would define the standard that Telecom's mobile business must reach when the competition arrived.

Four approaches were used to attempt to transfer the skills and experience in the USA to Telecom's mobile service.

**Firstly**, in 1987 senior executives from Southwestern Bell Mobile Services Corporation (SWBMSC) delivered a series of tutorials to the Telecom's mobiles services people over a month. AT&T and McCaw Communications were the largest mobile operators in the USA, and SWBMSC was high in the second tier, the dominant operator in the US mid-west.

The senior executives covered the marketing, operations and engineering areas by outlining their operations, experience and plans for their market in the US. The visit proved very useful. The SWMBSC people were completely open about their business and provided a generous range of data; marketing, engineering design, construction, operations and accounting plans and processes that Telecom could adapt to make faster progress. Perhaps as important, Telecom mobiles marketing, engineering, systems and accounting people could observe first-hand the type of people with whom they would be competing, how they thought and how they were motivated.

**Secondly**, in 1988 Coopers & Lybrand reported on the wider US cellular mobiles market. The results are summarised later.

**Thirdly**, 18 months after launch, Booz Allen-Hamilton, a world leading benchmarking consultancy at that time, reported on how Telecom's mobiles business compared to the US benchmark. The results allowed sufficient time for mobiles to bridge any gaps, and are provided later in this paper.

Towards the end of 1988, within 20 months after launch, Telecom's mobile services management clearly knew the standard required and broadly how to achieve it. The results were factored into the business plans for 1989/90.

**Finally**, during 1991 contacts with AT&T, GTE Mobilenet and SWBMC provided briefings of their business plans, and these were used to update the business plan for 1992/93.

## The Coopers & Lybrand Report

Early in 1988, within months of the SWBMSC seminars, Coopers & Lybrand (C&L) reported the results of a 'Study of the USA Cellular Market'.

It was understood that while the USA was well ahead in terms of strategy, marketing, service and billing, the USA was falling behind Europe in setting and following network standards – for example, GSM, GPRS and UMTS.

The main items of interest in the C&L report which might be helpful to Australia were:

- in the USA **in the first four years of competition?** (1985-88) mobile operators charged a high premium for the convenience of the mobile service compared to charges for the fixed (wire-line) service; the activation charge – the charge for "switching on" the handset to the radio network, the equivalent of the fixed line connection charge, the monthly access charge and the per-minute call charge were far higher. The belief was that this premium had virtually no effect on cellular growth and activations;
- cellular network activation fees and access charges varied widely over the cellular markets, but had moved little over the five years;
- operators charged very high roaming fees because customers moved frequently between the many cellular market areas – some markets charged a registration fee, a per-day charge and a per minute charge. Roaming revenues increased from 7% of total revenues in 1986 to 18% in 1988;
- the most common billing policy was airtime (the time the call occupied the radio link for the call) rather than the shorter connect-time for the call. The billing unit was commonly one minute;
- mobile operators offered a medium degree of bundling of terminals, access and call charges;
- Typically four additional features (such as all forwarding, call waiting, speed calling and emergency hotline directory listing) were offered with the basic service. Discounts were offered on the basis of the number of minutes billed per month, the number of users on an account, and the degree of competition in a market. The maximum discount on a minute basis was about 15% and on a line basis about 23%;
- the average monthly cellular bill had fallen from \$141 in 1984 to \$92 in 1988 and was expected to drop to \$60 by the mid 1990's. Apart from the effect of competition on prices and revenue over time, new customers tended to make fewer calls and more of their calls were local calls;
- by the end of 1988, after five years, carriers were covering 75% of the US population and this was expected to reach 95% by the late 1990's. The number of customers had reached 1.9 million. The service penetration was 6% of the population;
- "de facto" network performance standards were operating within the industry which would likely take another year or so to be agreed formally and promulgated;
- Ideally mobile networks were designed to allow no more than 2% of calls to be blocked at peak traffic periods, but rapid growth has caused considerably greater blocking. Similarly, the de facto standard for call dropouts was 2-3% which was regarded as acceptable; if exceeded it was assumed that there was a system or subsystem failure and an investigation was triggered by the operator;
- there were basically three types of cellular phones offered. Portable (5% of the market), transportable (a phone with a battery pack - 20%), and fixed phone (installed in a vehicle - 75%), with several variants totalling less than 1%, including a credit card phone;
- customers selected a phone mainly on the basis of cost. Average wholesale prices for phones were falling; from mid 1983 to the end of 1987: "fixed" cellular phones fell from \$3027 to \$1432; transportable phones from \$2292 to \$1734; and portable phones from \$2704 to \$2304;
- Retail prices of phones were now more affordable for tradespeople, business people and residential people. In January, 1988, mobile phones were advertised for as little as \$350;
- 56% of customers bought a terminal from the carrier or its agent; 19% from a radio dealer, 15% from a retail outlet, 6% from an audio sound store and 11% from others;
- the carrier and its agents sold 64% of phones and network access, independent dealers and manufacturers 12%, subagents 9%, resellers 9%, and others 6%;
- to service the phone, 43 % went to the carrier or its agent;
- knowing the customer base in the market was crucial. Churn, the loss of customers to a competitor, had reached 30% in a year in some markets. The network battle was for the highest number of the most profitable customers and minimising "churn";



- SWBMSC's customer distribution by usage in 1991 was typical ? see Table 1.

**Table 1: SWBMC Distribution of Airtime Usage (Call Time)**

**The top 10% of customers contribute 45.3% of airtime.**

Users (%)	10	30	50	80	90	100
Airtime Usage (%)	0	1.78	5.36	7.54	7.100	

**Source: SWBMSC, 1991**

- market share depended almost totally on direct or tied distribution; the customers who are known to the operator. Customers of airtime resellers were vulnerable;
- Tied distribution insured against loss of customers due to reseller takeover, financial failure or disloyalty;
- resellers were motivated almost entirely by payments offered. The higher the influence of resellers in the market the higher tended to be the network retail prices (to meet reseller profit expectations);
- the emergence of mobile networks had driven the development of a wide range of new applications, including fixed cellular service for locations difficult or costly to connect to the fixed network, remote monitoring and sensing, security and medical alarms, coin and credit card operated payphones, fleet vehicles and data transmission.

From this report Telecom's decisions on access charges, call charges, charging (or not) for roaming, and connect time billing seemed sound to drive growth. The fall in average monthly billing and phone retail prices were compared with the assumptions in the business plan and adjusted to the extent considered applicable to Australia. Three fundamental areas needed more work: bundling of terminal and network charges including discounting; network performance standards; and distribution through resellers and agents.

## Deloitte Ross Tohmatsu

In November, 1990, Deloitte, Ross Tohmatsu provided a report comparing the cellular businesses of Telecom and Bell Canada. It supported almost all of the Coopers & Lybrand study. The four levels of rate packages were remarkably similar.

The main reasons that customers in Canada chose Bell Cellular were service and coverage (53%), price (27%), reputation (7%), customer service (6%), liked the sales person (5%) and extra service features (2%). Revenue per customer per month had fallen from \$108 to \$93 over four years. The monthly churn rate had increased from 1.7% to 3.0% over the same period, later reaching 4%. While the two businesses had about the same number of employees, Mobilenet had half the sales representatives (118 vs 233) and 17% more technical and engineering people, primarily due to the luxury of a network monopoly.

## The Main Strategic Actions

The main strategic actions taken from 1985 were textbook actions, unremarkable in the private sector.

The priority was to drive growth and match any competitor entering the market in five years to 1990. To achieve faster progress the business would adapt overseas experience, technology and systems, using the contacts in the USA as the major source of experience and information.

1. Drive revenue growth as rapidly as possible to establish a strong market position by 1990 (assumed entry of competition) and a major share

This would generate a higher cash flow and an earlier return on investment, support a dominant branding, market position and market share in the market in 1990 and beyond, and set a standard for any competitor to attempt to match.

The launch of the cellular service would be, at latest, in early 1987. This allowed three years to establish the

required strong market position by 1990.

The service concept and key characteristics should be superior to those in the USA.

## 2. Deploy the Network to provide 90% coverage in 1990 and superior calling quality.

Comprehensive coverage, a superior call quality, network performance, and capacity would support the required high customer growth, establish a perception of superior performance and service, and achieve a dominant market position in the early years of competition with premium prices.

In overseas competitive markets two of the three most important factors in achieving the dominant position were **service coverage** ? both in terms of population covered and service reach, for example, at street level and within buildings and basements ? and **calling quality**. Also, to have any chance of maintaining the cellular monopoly (which was very unlikely), Telecom had to be perceived as acting responsibly by providing a rapid build-up in coverage.

Growth in coverage was limited by construction capacity and funding, both of which would be driven within the business. The growth in services was expected to be higher than in the USA, and without competition operating margins would be greater.

Coverage of 90% of the population by year five was a high-risk target. A rapidly expanding coverage and a high growth in the number of customers risked compromising the calling quality: either calls could not be connected, faded when the radio signal weakened, or terminated when the radio signal was lost. Causes included traffic congestion (calls exceeding capacity), calling beyond the service coverage, and "black spots" or "holes", places where the radio signal did not reach. Black spots would multiply as the price of handheld mobiles fell and many more calls would be originated from handhelds within cars, buildings and other radio sheltered locations.

It was a huge challenge to build capacity in an area ahead of a rapidly increasing customer base, expand to other population centres on the coverage schedule, and quickly respond when customers inevitably discovered "gaps" in the network.

3. Adopt and deliver the US "de facto" network standards until a future regulator introduced national standards.

These seemed appropriate and would provide a reasonable rationale in negotiations with a regulator for any national standards and the handling of complaints.

## 4. Attempt to maintain the Call Charge and Billing Structure, although different from the US.

The key feature of the structure was that it was customer friendly and encouraged high growth and usage. While a competitor could challenge with a charging increment shorter than 30 seconds, other elements such as caller pays, connect time billing, free roaming and free voicemail could all be changed, but would be difficult for a competitor to change unless Telecom followed.

## 5. Because Network competition was almost certain ? perhaps in 1990 ? attempt to influence Government policy to minimise any negative regulatory impact on Telecom

The most likely time for a regulator to introduce competition was when Australia decided, through a regulator, the standard and launching date for the next generation of mobile technology that would replace AMPS. This

technology would be digital and possibly the service proposed for Europe ? General Service Mobile (GSM) ? planned for the early 1990's. This timing was later than the assumption that competition would begin in 1990.

Telecom's corporate policy was to oppose network competition, but this was unrealistic.

Within that policy, and using the overseas studies as precedents, Telecom would attempt to influence the development of the new regulatory framework so that it imposed few, if any, disadvantages on Telecom. Concerns within Telecom included that the new digital technology was acceptable to Telecom; Telecom would not be required to provide air time resale to a competitor; interconnect fees for competitors and airtime reseller wholesale prices would be reasonable; Telecom would not be required to accept calls initiated by a competitor's customer outside the competitor's coverage area; and sharing sites and equipment including mobile towers with competitors would not be required.

## 6. Structure a strong Marketing, Sales and Customer Service capability

Noting the US experience, the priority was to drive growth and, when competition arrived, minimise churn. Logical actions followed from this, for example:

- segment the market based initially on the US experience, identifying the higher profit segments;
- develop early profit contribution tracking by customer to assist in identifying and retaining higher profit customers;
- maintain the initial service concept to encourage take-up and calling, and in the year before the introduction of competition, prepare a range of bundles of terminals with service charges and with discounts based on call minutes;
- attempt to "own" at least 70% of the customer base by confining the airtime resale customer base to less than 30%. This meant a strong sales force perhaps gaining at least 50% of the customer base and solid support for distributors and agents with services expertise, promotion and support for their sales activities. Customers "owned" by airtime resellers could be lost overnight to a competitor or through reseller bankruptcy;
- provide almost "instant" activation by 1988 to support take-up;
- provide 24/7 customer service. This would take a year or so. Initially customer service would be offered by Telecom's low productivity operator services area with full unionisation and strong resistance to change;
- monitor the RACE system to ensure it would be fully competitive, particularly its capability to identify early any market trends such as churn, which in the USA and Canada could exceed 30% in a year. Around 1990 seek a superior national computer system to support more flexible service pricing, packaging, billing and distribution to be installed nationwide within two years;
- attempt to develop a range of unique and sustainable features that would provide a competitive advantage ? see later.

## 7. In 1988, based on the planned Booz Allen Hamilton (BAH) benchmark study, lift the customer service, operations and performance to benchmark within two years.

1988 was almost two years after launch which allowed time for the business to settle down.

The BAH study would identify gaps in performance which must be bridged before the competition arrived, assumed to be in 1990.

8. Recognising that Cellular is likely the Core business; expand into other Mobile markets that satisfy profit, market

strength and other criteria

In 1985 Telecom was already providing a radio paging service and the PAMTS mobile service. Radio paging services were transitioning to digital technology, but were likely to be largely replaced by cellular mobile services over the next decade.

A number of mobile technologies were emerging or would do so in the next few years.

The cellular technology provided a large number of mobile applications as well as "fixed" cellular services. Trunked private mobile radio (TPMR) was a vehicle-fleet-based radio service attractive mainly to transport businesses. Data despatch was a low cost communication service. Land mobile satellite services offered vehicle and fixed point communications which were particularly useful in the rural and remote areas. Aeronautical mobile services could operate from planes.

CT2, a UK standard, was an advanced cordless, short range cellular mobile service which might complement AMPS. A European digital standard for short range cordless systems, DECT, was expected to be widely used for homes and wireless business systems.

Each of the emerging technologies would be monitored against several investment criteria. For example, the standard must be internationally accepted (as was GSM), the demand must be nationwide (as was TPMP and GSM), and the demand must be economic and complementary to Telecom's range of services. If the demand were doubtful or unproven, a low-cost trial might be undertaken to assess the service and demonstrate Telecom's responsiveness as the national carrier. See later.

## 9. Attempt to create a range of Service Differentiators which will support market leadership and the largest market share at a price premium.

A differentiator is a service feature valued by a customer or market sector that can be introduced at any time and which a competitor is unlikely to match within three months. The thinking was that with a range of features available, one or more could be introduced at times to support Telecom's price premium, accelerate demand or to counter a competitor's action.

Telecom would aim to maintain the advantages of network coverage and calling quality which would be reinforced by differentiators such as unique distribution capabilities and service offerings.

GSM, being a digital technology, offered a huge potential for developing differentiators. At the time examples might include immediate activation, immediate billing, short messaging, conferencing, user call reporting systems for business customers, Fleetswitch for vehicle fleets, find-your-phone, and personal and property security.

## 10. Operate the Mobile business "Independently" of and physically apart from Telecom.

All the cellular mobile businesses in the USA and Canada - SWBMC, GTEM, and Bell Cellular - operated as independent companies, to have the flexibility needed in the highly competitive mobile markets. Those associated with the Bell System and GTE were certain that to work within the parent would cost substantial market share and profits. Telecom mobiles needed the same flexibility to achieve the ambitious deployment and build-up, and to prepare for competition.

To be credibly competitive Mobile Services had to be physically separated from the Telecom public service culture. This would allow faster and more focussed improvement.

This meant that:

- the business strategy and marketing strategy would operate "independently" of Telecom's fixed network,

- but take advantage of synergies such as branding and using the Telecom sales force as another sales arm;
- Noting the experience in the US mobiles market, a substantially different approach was needed for marketing mobile services compared to the landline market. For example, even without competition there would be network resale of mobile services but not for landline services. Most mobile terminals would be installed and repaired at depots while landline customers would continue to be connected and serviced by visits of technicians to premises. When competition began the churn of mobile customers was expected to be substantially higher than for landline customers;
- the mobile network would be designed and built "independently" of Telecom's landline network. This would avoid delays and limitations usual in Telecom engineering, but take advantage of synergies such as common facilities - exchanges, the marginal cost of base station back haul and property sites;
- information systems would operate "independently", particularly the adaptation and operation of the RACE system, but take advantage of synergies such as computer processing centres and computer networking;
- all other business functions would operate independently of Telecom including accounting systems;
- the business should be located physically apart from Telecom and at arm's length to attempt to eventually extinguish the public service policies as well as the culture. In time this could permit the negotiation of workplace agreements and working practices appropriate to the market and the competition, in most instances significantly different from mainstream Telecom.

Separation from mainstream Telecom and incorporation would enforce a more disciplined, responsible and accountable behaviour among the management and staff. Outside the Telecom "comfort zone" the consequences of workplace complacency and incompetence would soon be apparent in loss of market share and of employment.

In 1987 the new mobiles businesses was located about three kilometres from Telecom's headquarters.

The eventual aim was to establish Mobile Services as a separately incorporated "arm's length" subsidiary of Telecom.

## 11. Implement a formal business relationship between Telecom and Mobile Services

This relationship would include "arm's length" interconnect conditions and the provision of services such as network services, computing and accommodation at commercial rates.

The aim was to attempt to minimise the negative effects of deregulation on Telecom as a whole, and to make Mobilenet's trading statement more commercially realistic.

Under network de-regulation, the industry regulator would be expected to rule on such as fees for a competitor to pay for interconnection with Telecom's landline network and for wholesale rates for resale of Telecom's capacity. With Mobilenet paying a high interconnect fee to Telecom - a rate at that time of 13 cents per minute - this might support a higher fee to apply for a longer period to interconnecting carriers.

## Modelling Mobilenet

Mobilenet was a service which required extensive and continuing mathematical modelling for the business plan, the related trading statement and for the design and deployment network.

There were six main variables: the rocketing demand for the AMPS service beyond forecasts: the falling prices of the mobile phones; the transition from the AMPS technology to the GSM technology; the upgrading of the business plan after the SWBMSC seminars (1987), the Coopers & Lybrand report (1988) and the Booz Allen Hamilton benchmarking study (1988); the nature and timing of competition; and the costs of distribution -- direct, agents and resellers under competition.

Specifically, some parameters to be modelled included market demand and shares for different market entry dates

of network competitors, customer bases for AMPS and GSM after the launch of GSM, both for Mobilenet and competitors, and payments to resellers and distributors to attempt to secure the customer base.

Both the growth in customers and related calls from 1987 were higher than expected each time the business plan was reviewed, and higher than experienced in other markets around the world except perhaps Hong Kong.

## Booz Allen Hamilton Benchmarking Study

Information from the mobile businesses in the USA since 1987 indicated that Mobilenet was broadly on track to be competitive. As a check, Booz Allen Hamilton, a US-based benchmarking consultancy, was engaged to report on progress in 1988.

BAH reported that, after almost two years in operation, overall Mobilenet's performance was at parity with typical US performance in terms of network performance and financial performance. The service concept, including call charging, was a sound basis for network competition. One superior factor was that the calling party pays. It seemed that given the decisions taken for pricing and billing, revenue, network performance and the interconnect regime were satisfactory. See Table 2.

Areas of lower performance were daunting: that is, revenue generation; marketing costs (unrealistic when there was network competition); engineering efficiency (might save \$5 million per year); customer service performance (unacceptable when there was network competition); and capital efficiency (might save up to \$30 million).

Revenue performance was lower than the best US performance ? \$1,600 in Australia vs \$1,600-1,900 per service in operation in the United States ? mainly due to deliberate current policies such as 30 second billing increments, free roaming and messaging.

Marketing and sales costs were very low compared to the US due to the monopoly, and would be far higher when competition began; for example, the sales cost per customer was \$100 compared to \$170 in the US.

Customer service quality and efficiency were at the low end of US ranges and were unacceptable for future competition. This was due to the service being provided by Telecom's low performance and low productivity operator services. Closer to competition, a separate mobiles service team would provide a 24-hour service at high service quality and cost parity.

The construction and operating performance was clearly affected by three factors: the service was still bedding down two years after launch, the very ambitious increase in the network coverage and the high growth rate in customers.

Overall the quality of performance of the network was comparable to the US, but improving engineering efficiency might save \$5 million per year, and capital efficiency could save up to \$30 million.

Considering the priority for rapid growth, the related ambitious network rollout and the two years' experience in operations, most gaps in construction and operating performance would be bridged in the short term.

Parity with the US in engineering efficiency and capital efficiency could be improved by increasing the number of customers per radio channel.

All gaps demanded early and strong action, and would be bridged over the next year. The huge difference in spending between pre- and post-competition in marketing and sales was factored into the business plan for the year prior to competition, part financed by productivity improvements and savings across the business.

**Table 2: Booz Allen Hamilton Study - Mobile Performance against the US Benchmark - 1988**

		USA	Telecom
Sales	Sales cost per customer	\$170	\$100
	Commissions	\$345	\$14
	Marketing	\$200	\$150

Customer Service	% of customers with billing enquiries	8-9%	14.8%
	% of billing enquiries answered within 40 seconds	98%	12%
	Billing calls dealt with per day per operator	80-100	54
	Service hours	24 hours	8.30-5.00
Network	Minutes of use per month - Outgoing	220-225	180
	Incoming	20-35	70
	Dropped calls	1.7%	3.4%
	Target ? less than	5%	5%
	Blocked calls %	1.6	2.2
	System outage mins (peak)	2.5	4.1
Engineering	Engineering and field operations ? costs per SIO	\$40	\$183
	Field operations staff SIOs per person	6500	3500
	Development and support staff	10	25
	Plan & design engineers SIOs per person (Telecom high due to large build program)	6000	3500
	Software engineers (High in Mobilenet due to customisation of software and in-house capability which is normally left to the supplier in the US)		
	Average cost per channel	\$7-9,000	\$8,750
	Switching cost per channel	\$2,600	\$3,450
	Infrastructure (cost per base station excluding buildings)	\$290,000	\$260,000
	SIO per channel	26-33	19
	Subscribers per base station	730-1300	607
	Capacity reserve (weeks)	8	13
	Incremental capital/incremental SIOs (Mobilenet?s plan to incremental capital per incremental SIOs \$920 in 1991/2, \$750 in 1992)	\$800	\$1200
	Capex	Capital investment per SIO (Capital efficiency, normalised for traffic patterns was 10% off best US performance)	\$830
Admin	Staffing: Customers per employee	1850	1800-2500

## Other Mobile Services

In addition to the basic mobile telephone service, the AMPS cellular service became increasingly popular as public (cellular) mobile phones in taxis, and were successfully trialled in trains and buses and, in Sydney, ferries. Mobile fax machines became available with potential new applications in public places and offices. Automatic vehicle location and monitoring systems enabled improved security and utilisation of vehicles, particularly for fleets. Mobile point of sale terminals could be used where fixed network connection was difficult or inconvenient. ?Fixed mobile? allowed remote monitoring of sensors such as those used to monitor water levels in reservoirs or security systems in businesses, warehouses and homes.

The PAMTS service launched in 1981 was continuing to operate for the peak of 14,000 customers connected, but was phased out as the cellular service became available in each area as AMPS offered superior service and portable handsets.

Telecom's radio paging business reached a peak in 1989 with over 130,000 customers and was the largest in Australia covering more than 110 major metropolitan and regional localities. Messagebank, a computerised voice messaging service, allowed storage and retrieval and immediate or delayed redirection of phone messages to one or multiple destinations. Telecom's share of the network market was 45% and paging terminals about 35%. With

the success of the cellular mobile service becoming obvious, with expanding coverage and handset prices falling, new connections of pagers fell for the first time from 36,000 in 1990 to about 27,000 in 1991. The arrival of digital paging with enhanced messaging in the pager was unlikely to reverse the trend. Under open competition, the paging service was unprofitable to Telecom; any margin earned in the sale of pagers and network usage was almost soaked up by the cost of Telecom's inefficient operator services in handling the calls and overheads. After 1990 the paging business was wound down. The arrival of the short message service (SMS), a feature of GSM, introduced in Australia by all three carriers in 1994, made paging obsolete.

Trunked private mobile radio (TPMR) was a vehicle-fleet-based radio service mainly attractive to transport businesses. Land mobile satellite services offered vehicle and fixed point communications which were particularly useful in the rural and remote areas. Aeronautical mobile services could operate from planes. A business case for TPMR was developed and approved in 1990. After spending about \$3 million on design and development the service was abandoned when the formation of the Australian & Overseas Telecommunications Corporation (AOTC) was announced by the merger of Telecom with the Overseas Telecommunications Corporation (OTC). OTC's Maritime Services was already preparing to provide a TPMR service.

CT2, a UK standard, was an advanced public cordless, short range mobile service which might complement AMPS in public areas; one application was Telepoint, a low-cost phone which called through base stations located in public locations such as streets, petrol stations and restaurants. A European digital standard for short range cordless systems, DECT, was expected to be widely used for homes and wireless business systems. Telecom proceeded with a small trial of the CT2 service in 1990 costing about \$2 million. The technology worked well but there were limitations. The range of less than 200 metres, the susceptibility to electro-magnetic interference, the inability to receive calls unless near the registered base station (usually the home or business), the number of rival standards available that would not interwork, and the emerging DECT standard, argued against proceeding beyond the trial. It was a disappointment for the technologists and visionaries at the time. Their thought was of a ubiquitous ?Universal Mobile Telephone Service? (UMTS) perhaps based on the European "son of CT2" as well as future improvements in DECT and GSM. As is known, the widespread coverage and falling cost of digital cellular services and the falling prices and expanding feature set for cellular handsets became a "UMTS".

An Aircraft Telephone Service was assessed for covering major flight paths between all capital cities (including Canberra) and extending north to Cairns. Telephones on aircraft would make calls automatically to anywhere in Australia and overseas charging to a major credit card. Work with the airlines on some tests indicated that, with competition approaching, their level of interest was not sufficient for Telecom to invest.

As previously mentioned, each of the emerging technologies was monitored against several investment criteria. For example, if the demand was unproven, as for the CT2 service, a low-cost trial might be undertaken to assess the service and demonstrate Telecom's responsiveness as the national carrier.

## So What Happened ? Regulation?

In 1988 the Commonwealth Government released a statement on the future structure of the telecommunications industry; ?Australian Telecommunications Services: a New Framework?. For the time being Telecom and OTC would continue with network monopolies and the customer premises market and the value-added services market would be open to competition. A new industry regulator would be created which would ensure maintenance of standards, fair and efficient competition in open markets and the efficiency and accountability of the monopoly carriers.

In 1989 legislation created a common carrier licence for the landline line market including all telephony and broadband based public services and private networks, with Telecom granted a licence. The licence confined Telecom's monopoly to the public switched network and the conditions under which the monopoly would operate. The significance of the licence was that other such licences could be granted in the future. From 1989 others could compete for any services other than the public switched network such as value added services and the emerging internet type of services. The Act also created a regulator (AUSTEL).

AUSTEL began regulating the market in 1989 and held a number of inquiries. The ?Inquiry into the Implications of



Licensing an Additional Network Operator for Cellular Mobile Telephone Services? recommended that GSM would be the digital cellular standard for Australia, and that there should be two licences issued for digital cellular networks in addition to Telecom. The reason for selecting GSM standard was that it was the only 2G technology that at the time could, by design, support more than two operators. AUSTEL concluded that a duopoly was insufficient to achieve a satisfactory level of competition. The ?Inquiry into The Best Means of Introducing Public Access Cordless Telephone Services to Australia? recommended that there should be no limitations on a service provider other than technical standards and radio spectrum.

Related outcomes of legislation and regulation in 1991 were:

- the establishment of the Australian and Overseas Telecommunications Corporation (AOTC - later Telstra) in 1992 with the merging of Telecom and the Overseas Telecommunications Corporation (OTC);
- the granting of licences to Optus for landline and mobile network services and to Arena for mobile network services;
- AOTC was required to permit Optus to resell AOTC's landline services and Optus and Arena to resell AOTC's mobile services from 1992 with wholesale rates to be determined by AUSTEL;
- Optus and Arena could begin marketing of GSM mobile services on their own networks in 1993 with rates for interconnection with Telstra's networks to be determined by AUSTEL;
- if a review assessed the 1989 de-regulation a success, full-scale competition would be introduced by 1997;
- to make the two new mobile licences more attractive to bidders and to release radio spectrum, Telstra's AMPS network would be shut down when the three digital networks had sufficient coverage, so as not to disadvantage analogue customers.

Although Telstra could have provided GSM services in 1992, and was the first operator outside Europe to join the GSM club, in order to create a "level playing field" Telstra was constrained from offering GSM services until 1st April, 1993 when Optus was expected to be ready. Telstra was required to again delay its launch until 23rd April to meet the government's interception requirements.

Optus began marketing by reselling Telecom's network services in June, 1992, and services on its own fixed and GSM mobile networks around May, 1993. Arena (later known as Vodafone) entered the GSM mobile telephone market later in October, 1993.

Until the decision was made to issue two landline carrier licences and three mobile carrier licences Telecom's public position was that the landline and mobile monopolies should continue for several reasons, including the funding of the Telecom's service obligations (CSO's) and the importance of support for local manufacture. In fact Telecom's (and later Telstra's) real concern was that when, inevitably, competition was introduced, Telecom would not be disadvantaged by requirements such as funding of CSO's, providing resale capacity to competing carriers, unreasonably low interconnect charges and wholesale prices charged to competitors, future relationships with unions and government, or be impeded in expanding into overseas markets.

Telecom advocated GSM as the new mobile standard. Except for some Telecom insiders, the third mobile licence was a surprise, and all within Telstra were unprepared that the mandated closure of AMPS on 1st January, 2000 as an incentive to Optus and Arena. There was also some concern that the interconnect rates and wholesale prices for resale were too low.

The extraordinary gift of resale of the AMPS network to Optus and Arena was potentially very damaging to Telstra. Without one dollar of investment in a mobile network ? a network in which Telecom had invested about \$1 billion ? all a competitor needed to do was offer Telstra's mobile customers a discount to transfer, with the potential of gaining perhaps 20% of the market within the first year or two.

Telstra was not required to share base station or to provide backhaul transmission. Wholesale domestic mobile roaming ? for example, an Optus customer in an area not covered by Optus, being able to use the Telstra network ? was also not required.

Apart from the regulatory arrangements for the new telecommunications industry, it is interesting to note the wide range of other regulations and regulators that Mobilenet managed at the time. These included standards, spectrum,

trade practices, prices surveillance, privacy, environment (base stations), brain damage from use of handsets and consumer affairs.

## So What Happened in the Business to 1991?

Telecom's cellular mobile service, Mobilenet, was launched in Sydney in February, 1987.

The service was billed separately from the landline services, and unlike the landline bills, provided full itemisation of calls.

The handsets were clumsy, heavy and expensive for the times; about \$1,500 (\$3,500/2016) for the vehicle-mounted model, \$2,500 (\$5,800/2016) for the 'heavy duty' shoulder-carried 'portable' model, and \$4,000-5,000 (\$9,000-11,500/2016) for the hand-held "Walkabout" model. After one year the percentage of portable (hand-held) phones being used in Australia was 20% compared with Hong Kong 80% and the USA 10%.

Mobilenet's rollout of coverage was very fast, a triumph for Telecom's mobile network engineering group. Mobilenet was operating in Sydney in February, 1987, and Melbourne in May, 1987. By June, 1988, the service was operating in all capital cities except Perth and in 10 regional areas; there were over 30,000 connections, and sales exceeded 2,000 per month; Perth was covered several months later. In the first ten months the number of cellular services in Sydney and Melbourne exceeded those sold nationally on the PAMPTS network over the preceding seven years.

By the end of 1988 it was clear that competition would not begin in 1990 as assumed, but likely three years later. Also clear was that the strategic aim of 90% coverage was impractical. Telecom continued to rapidly expand the network. After less than four years, in June, 1991, coverage reached 77% of the Australian population; most of the regional towns were covered as were most of the intercity highways. It was possible to drive from Bundaberg to Melbourne along the Pacific and Hume Highways and never be out of telephone contact. Mobilenet was thought to provide the longest corridor of cellular coverage in the world.

In June, 1992, the number of services exceeded all forecasts, particularly among small and medium business customers, reaching 440,000, coverage exceeded 84% and call quality was at benchmark.

In January 1992, the Mobilenet network was reasonably well prepared for competition. New customers were connected to the network within 30 minutes for six days a week (Sunday trading was yet to come). A range of 'Flexi-Plan' tariffs combined various combinations of access fees and discounted call charges provided customers with greater control over calling costs. Call tariffs were simplified from three charging periods to two; 'peak' and 'off-peak'. A 24 hour a day customer service was operating seven days a week.

Untested was Telecom's skills and experience in competition against Optus and Arena (later Vodafone).

### Table 3: Analogue Cellular Radio Networks - Size & Penetration - 1985-1991

Source: World Bank, Collection of Development Indicators

Country	Number of Customers Penetration Rate per 1,000 inhabitants - 1991			Year of Launch
	30.6.1985	30.6.1991		
Australia		291,459	17	1987
Canada	12,000	775,831	28	1985
Denmark	46,100	175,943	34	1981
Finland	67,639	319,137	52	1981
France (RC2000 system)		375,000	7	1985
Germany	1,080	532,251	7	1985
Italy	6,415	568,000	10	1985
Japan	61,800	1,378,108	11	1979
New Zealand		72,300	21	1987
Norway	63,075	196,828	55	1981
Sweden	73,000	568,200	66	1981

United Kingdom	5,000	1,260,000	22				1985
United States	340,213	7,557,148	29				1983

**Table 4: Growth in Telecom's Mobile Service (Mobilenet) - 1987/93**

**Source: Australian Telecommunications Corporation Annual Report, 1991.**

Year ending 30 June	1987	1988	1989	1990	1991	1992	1993
Cellular Mobile Services in Operation	4,423	31,622	94,529	184,943	291,459	440,000	635,000
Cellular Mobile Call (millions)	3.1	27.9	74.0	156.0	158.3		
Coverage of the Population (%)					77	84	

After four years the growth rate of Mobilenet services was one of the highest in the world, having regard for the small population, the distances to be covered, and the rate of deployment required to cover the capital cities and highways. Table 3 shows the year of launch, customer base and rate of penetration of analogue cellular networks for range of countries to 1991. Table 4 shows the growth in mobile services in Australia to 1993. Between January and June, 1991, the penetration of cellular services in Australia rose from 15.2 to 24 services per 1,000 population.

Rapidly expanding coverage and the high growth in the number of customers risked compromising the calling quality; either calls could not be connected or were terminated when the radio signal was lost. The engineers had a challenging task increasing the coverage area, raising the capacity where traffic congestion emerged and filling in the "black spots".

### An Evolution of the Cellular Mobile Phone

**Top left: PAMTS in-car unit with the (white) cabin handset; Top centre, right & middle row left: AMPS units; Middle row 2nd left: Mitsubishi Walkabout - the first AMPS hand held; Front row first four: GSM handsets; Front row 5th from left: Qualcomm QCP860 - the first CDMA hand set.**

During the first four years of operation of the AMPS service terminal prices plummeted due to the economies of scale and the effect on unit prices, and was one of the main drivers of network growth. Network competition after 1991 would likely lead to some cross subsidisation from network revenues of terminal prices, offering customers an even lower entry price to join the service, likely accelerating the already high network growth.

In 1989, within two years of launch, Mobilenet was profitable - see Table 5. Mobilenet and the basic telephone service were the only network services within Telecom to achieve profitability during the 1980's. The data services incurred losses over that period with DDS making a profit for the first year in 1989/90. ISDN was launched in 1987 and by 1990 had accumulated losses exceeding 90 million.

By the end of 1991 it was clear that mobile services would be a strategically crucial profit stream for the new Telstra - see Table 6.

**Table 5: Telecom's Product Accounting Results - 1989/90**

**Source: Finance & Accounting**

	Revenue	Expenses	Contribution	Non- Attributed Overheads	Net Contribution
	(\$millions)				
Telephone Service:					
Basic Access, Local Calls, STD calls, International					

Calls, 008,	5858	3868	1988	614	1372
National Operator Assisted					
International Assisted					
DDS	271	204	67	31	35
AUSTPAC	46	120	74	11	85
Leased Lines	304	28	20	40	19
ISDN	4	45	41	4	45
Mobiles Network	259	138	120	21	99
Directory Publishing	557	299	257	30	228
<b>Grand Total</b>	<b>8,823</b>	<b>7,531</b>	<b>1,293</b>	<b>888</b>	<b>1,293</b>

**Note that the product accounting data was controversial within Telecom, with many product people reluctant to accept the methodology and results. 1989/90 was the first year that DDS broke even and the year that the ISDN service was launched.**

## The Mobile Services Business transferred to Telstra in 1992

AOTC (later Telstra) was established in 1992.

The mobile business handed over to AOTC was a strategically strong and profitable platform for the future:

1. the projected trading performance over the five years to 1997 was strong ? see Table 6. Although competitors would begin network resale in 1992 and network competition in 1993, revenue was expected to increase from about \$600 million to almost \$1.3 billion in 1997. More significantly, projected profit was planned to rise from about \$115 million to about \$0.4 billion over the same period. Return on Assets would grow from about 17% to about 40%;
2. the projected product and service range and service levels appeared competitive;
3. market positioning and branding seemed strong.

However, while the mobile network appeared overall to be competitive, there appeared to be four potential weaknesses:

- the potentially very damaging requirement that the competitors must be permitted to resell Telstra's AMPS network at a low wholesale price determined by the regulator. This might result in a loss in market share exceeding 20% in the first few years;
- Telstra's marketing and sales skills and experience had yet to be tested against the two competitors;
- the distribution system of agents and resellers was not as solid as in the USA;
- a nationwide standard and world parity mainstream computer system would likely be needed to replace the RACE system about 1992.

**Table 6: AOTC Mobile Communication Services - Business Plan - 1991/97**

**Source: Enterprises Division Business Plan - 1992/97**

Year ending 30 June	1992	1993	1994	1995	1996	1997
	Budget????????????????????Plan????????????????????-					
	(\$ millions - future prices)					
Revenue	595	829	985	1,110	1,110	1,348
Expenses	480	585	669	771	867	935
Profit	115	244	315	339	372	413
Capital Additions	166	176	187	223	204	239

Assets (WDV)	533	470	534	602	627	682
Staff (EOY)	1,015	1,210	1,224	1,334	1,449	1,521

#### Ratios

Revenue Growth (%)	39	19	13	12	9
Profit/Revenue (%)	19	29	32	31	31
ROA (%) (3)	17	35	40	38	41

**Notes: 1. Dated September, 1991.**

**2. The complete mobiles product & service range including PAMTS, AMPS, GSM, analogue & digital radio paging, Messagebank, CT-2 and PCN.**

**3. ROA - Profit before Interest and after Tax/Total Assets.**

**4. Resale of Telstra's network by competitors is assumed to begin early in 1992.**

**5. Network competition is assumed to begin in mid-1993.**

**6. The "Contribution" of \$99 million in Table 5 is not directly comparable with the Profit in the above table. There are differences in accounting rules, and the Table 6 figure results from some asset revaluations and write-offs due to competition beginning in 1992.**

## What Happened after 1991?

Optus began reselling Telstra's AMPS network in July, 1992, offering an incentive and lower access and call charges to encourage churn.

Within two years Optus achieved a market share of 34% which, together with a low regulated wholesale rate imposed on Telstra, was highly profitable with minimal capital investment. That market share was almost 4% higher than the share that Optus holds today some three networks and 22 years later. Arena, later Vodafone, chose not to accept the regulator's resale gift, and instead focussed on marketing its GSM network. As a result, with GSM proving to be difficult to sell in the early years, Vodafone took 10 years to reach its peak market share of around 19%, a share that Optus achieved through resale in 13 months.

In April 1993 when Telstra launched its GSM network there were 635,000 analogue mobiles in Australia, and less than 4% of people had one. Almost all of the mobile traffic was voice.

Telstra continued to sell on the AMPS network ? as did Optus ? until GSM arrived in each area.

Problems with GSM in the first few years were so serious that it was more than four years after launch ? until July 1997 ? for the number of customers on all three GSM networks to equal the number on the AMPS network. The early performance of GSM phones was inferior to the AMPS phones; many phones provided poor audio quality and had a much shorter battery life. The coverage area of a GSM base station was far less than an AMPS base station; instead of the signal progressively fading as with AMPS, the GSM digital signal failed abruptly. Many customers trading "up" to GSM quickly switched back to AMPS.

The AMPS network at its peak had over 1 million customers. A condition of Telstra's licence was that the AMPS network close by the year 2000. As that time approached customers who appreciated the wider coverage area of AMPS, particularly those in regional areas, pressed for an equivalent digital service. Telstra was required to deploy a digital service based on the US CDMA standard to match the coverage of AMPS. The CDMA network was launched in September 1999 and was popular outside of the capital cities because it covered much greater areas than any of three GSM networks. CDMA grew to cover over 1.5 million square kilometres and 98% of the population. It had considerably broader reach than any other mobile network at the time. The CDMA network reached a peak of 3,000 base stations supporting 1.7 million customers (about half in rural areas) in June 2006. As required, the AMPS network did close in 2000.

The Australian mobile phone market reached 1 million in 1994, 2 million in 1995 and 3.6 million in 1996 (2.6 million AMPS). In 2000 the number of mobile phone accounts had reached 8.5 million, compared to around 10.6 million fixed lines in use. By December 2002 that had increased to 12.5 million mobile phone subscriptions, with 72% of all households having access to a mobile.

In 2010 there were more mobile services than people in Australia. Customer penetration rates were about 125% of the population. In June, 2016 it was reported that there were 32.9 million mobile accounts.

## Looking Back

Three thoughts about Telstra's mobile services business from 1992 come to mind.

**Firstly**, deployment of the cellular mobile service demonstrated, yet again, the value of competition. Although the growth rate was high under a monopoly, the growth exploded with competition and falling handset prices.

**Secondly**, whatever Telstra's loss of share of the mobile market in the first few years of competition, mobile services grew to be financially crucial to the corporation. In 2016 mobile services revenue reached \$10.4 billion at a 42% EBITDA margin, almost 30% of key product revenue and higher than the revenue for every other key product. ([Telstra, 2016](#) [5]).

Telecom's 1991 mobile team can't claim any credit for that, but it at least provided a sound start.

**Thirdly**, Telecom's mobile team at the launch in 1987 anticipated that this new class of service would have a huge demand ? mobile phones and services, fixed mobile services, Dick Tracy type wrist phones, and so on. However, the team had a very limited understanding of how far the mobile trend would develop. The team had yet to experience the internet or apps.

By the end of 2016, both Optus and Telstra were expected to provide 98% population coverage, while Vodafone already provided about 96% metro population coverage. By early 2016 smartphones ? different from the 1987 dumb phones ? approached a penetration of 89% in Australia, and about 60% of survey respondents have a tablet. 34% of Australians do not have a landline ([ACMA, 2014](#) [6]). Smartphones, and to a lesser extent tablets, have become central as a means of accessing the internet and are beginning to dominate e-commerce, accounting for about a third of e-commerce transactions (Paul Budde, 2016). Australians are said to check their mobile on average 14 times a day. 68% of Australians access the internet using three or more devices ([ACMA, 2014](#)). [6]

These devices appear to be integral to how Australians live, organise and enjoy their lives, whether socially, professionally or personally. More than half the population check their smartphone within 15 minutes of waking, interacting continuously throughout the day without being prompted until disconnecting and switching off for the night ([Deloitte, 2015](#) [7]). A Telstra survey found that 50 per cent of Australians feel panic stricken within five minutes when they think they have lost their mobile phone; 25 per cent panic after less than a minute. Nearly half of Australians rank mobile phones as the innovation they value the most, more than the desktop computer, laptop or microwave oven.

In 1987 the Telecom mobiles team didn't forecast much of that.

## In Conclusion

The managers and staff of Telecom's mobiles services business worked outside the mainstream of Telecom to accelerate the launch of a new, superior cellular mobile service, to build a business which approached world class and would thrive when competition was introduced.

The key people included the manager, John Dearn; the network engineering manager, Kevin Phillips; the strategy manager, Reg Coutts; Peter Higgins and Tim Herring in marketing; and John Stanhope in finance.

Kevin Phillips, the leader of the mobile services engineering team, has a claim to be a prominent pioneer in mobile services development in Australia. He was important within Telecom and the industry in advocating the GSM standard for the digital cellular technology. He and his team designed and drove the very rapid deployment of the

AMPS network, the transition from AMPS to GSM and the introduction and deployment of CDMA as the AMPS network was phased out. In fact the engineering team's achievement was remarkable: a very rapid roll-out in a population concentration lower than Europe and North America and on one of the world's largest land masses; an analogue mobile network which achieved a higher penetration in four years than any other advanced country except in Scandinavia, and in the last two years began to overlay a digital cellular network which was ahead of any in North America. The engineers were strongly supported by their commercial and financial colleagues.

## References

ACMA. 2014. "Australian Digital Lives Report 2014 [8]".

Australian & Overseas Telecommunications Corporation. January, 1992. "Enterprises Business Strategy?". *Presentation to the AOTC Senior Management.*

Australian & Overseas Telecommunications Corporation. March, 1992. "Enterprises Strategic Review - 1992/97?".

Australian & Overseas Telecommunications Corporation. September, 1992. Annual Report, 1992.

Australian Telecommunications Commission. 1975-1989. Annual Reports for the years 1975/76 to 1988/89.

Australian Telecommunications Corporation Act. 1989.

Australian Telecommunications Corporation. 1990. "Product Accounting Report - 1989/90". Issued by Transfer Pricing Branch, Corporate Finance & Control.

Australian Telecommunications Corporation. 1990-1991. Annual Reports for the years 1990 & 1991.

Australian Telecommunications Corporation. June, 1990, November, 1991. "Enterprises Strategic Review".

AUSTEL. 1988. "Inquiry into the Implications of Licensing an Additional Network Operator for Cellular Mobile Telephone Services?".

AUSTEL. 1988. "Inquiry into The Best Means of Introducing Public Access Cordless Telephone Services to Australia".

BIS McIntosh Consultancy, July, 1988. "Mobile Services Development Potential in Australia?". *Presentation by BIS McIntosh Consultancy.*

Booz Allen & Hamilton. September, 1988. Enterprises Benchmarking Project.

Cresap, McCormack & Paget. 1973. "Study of the Organisation of the Postmaster-General's Department". Volume 2, Para 11.25.

Coopers & Lybrand. October, 1988. "Study of the USA Cellular Market".

Davidson, JA. (Chairman). 1982. Report of the Committee of Inquiry into Telecommunications Services in Australia (The Davidson Report). Recommendations in Vol. 1 pp 28-39.

Deloitte, Ross Tohmatsu. June, 1988. "Cellular Service?". *Presentation by DRT.*

Deloitte, Ross Tohmatsu. November, 1990. "Comparison of the Cellular Businesses of Telecom and Bell Canada?". *Presentation by DRT.*

Deloitte. 2015. "Mobile Consumer Survey 2015".

GTE Mobilnet. March, 1988. "The Cellular Service in the USA?". *Presentation by GTE Mobilnet.*

GTE Mobilnet. March, 1988. "1989-1993 GTE Mobilnet Strategic Plan?". *Presentation by GTE Mobilnet.*

Hutchison, Michael. Shaw, Anthony. Horton, Robert. 1987. "Report of the Task Force on Reform in Telecommunications".

Kantar Market Research. April, 2016.

Minister for Transport & Communications. 1987. "The 1987 Policy Guidelines on GBE Reform".

Minister for Transport & Communications. May, 1988. "Australian Telecommunications Services, a new framework". *Statement by the Minister for Transport & Communications*.

Moyal, Ann. 1984. "Clear Across Australia - a History of Telecommunications?". Nelson.

Oz Mobilnet. 2016. [3gwiz.com.au/ozmobilenet](http://3gwiz.com.au/ozmobilenet).

Price Waterhouse & Co. 1974. "Evaluation of (the APO's) Financial Management".

Reserve Bank of Australia. December, 2016. Estimates of past currency values in 2016 [www.rba.gov.au/calculator/](http://www.rba.gov.au/calculator/) [9]

Southwestern Bell Mobile Services Corporation. June, 1988. "Efficiency of Mobile Operations?". *Presentation by SWMSBC*.

Southwestern Bell Mobile Services Corporation, November, 1989. "SWBMSC Business Plan 1990-1994?". *Presentation by SWBMSC*.

Telecom Australia. February, 1980. "Public Inquiry into Telecommunications Services in Australia?". *Telecom's submission to the Inquiry*.

Telecom Australia. February 1983. "Telecom's Response to the Davidson Inquiry". *Telecom's submission to the government*.

Telecom Australia. November, 1988. "Enterprises Strategic Review".

Telecom Australia, May, 1990. "Telecom's Position for the AUSTEL Review on the Structure of the Australian Telecommunications Industry?".

Telecom Australia. June, 1990. "Special Business Products Business Review - 1990/92?".

Telecom Australia. November, 1990. "Special Business Products Business Review - 1990/96?" - November, 1990.

Telecom Australia. November, 1990. "Product Accounting 1989/90?" - Transfer Pricing Branch, Corporate Finance & Control.

Telecom Australia. November, 1991. "Enterprises Strategic Plan Review?".

Telecommunications Act. 1975.

Telecommunications Act, 1989.

Telecommunications Act, 1991.

Telstra Corporation. 2016. Annual Report.

Vernon, J. 1974. "Report of the Commission of Inquiry into the Australian Post Office".

World Bank, Collection of Development Indicators. December, 2016. <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators> [10]

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