

3G

Third Generation Mobile Networks in Australia

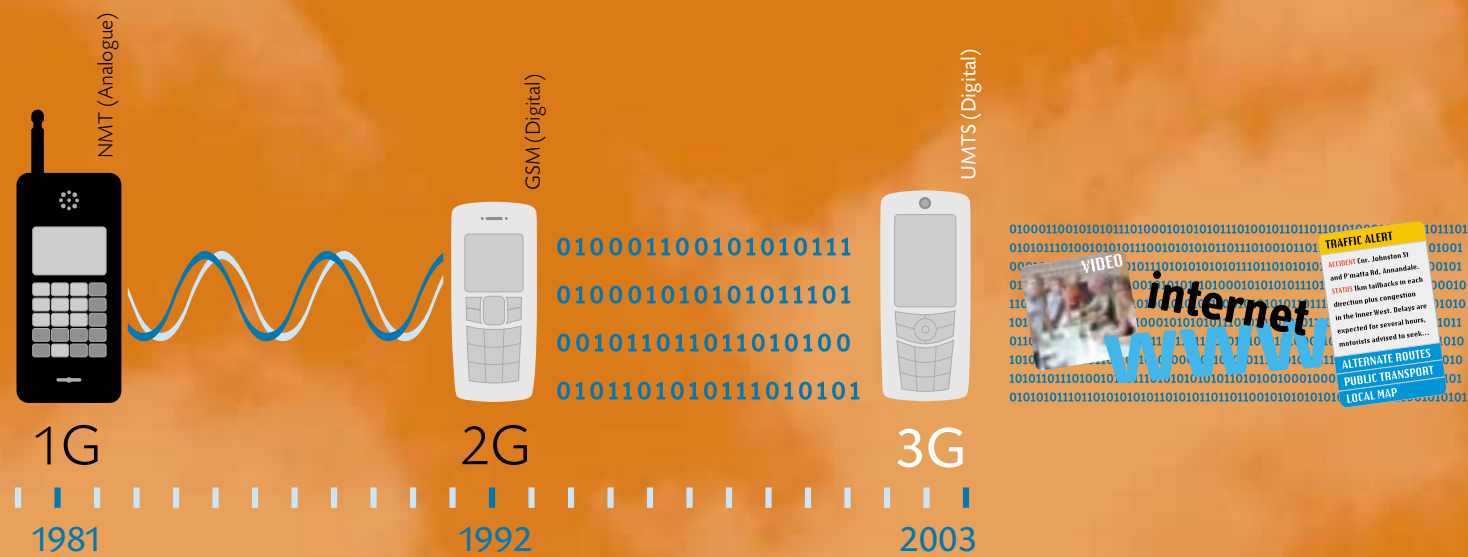
*Broadband for your
mobile phone*





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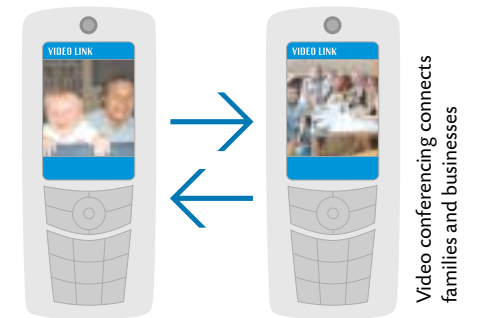
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WHAT IS 3G AND HOW DOES IT WORK?

The introduction of the 3rd Generation (3G) of mobile phone network in Australia has already brought significant changes to the way we currently use mobile phones and other wireless products, such as personal digital assistants or handheld computers.

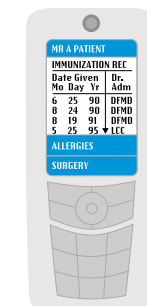
The main difference between 3G and earlier generation networks is how quickly data can be sent and received. 3G networks can send data up to 40 times the rates of earlier digital networks, which means that in addition to audio, graphics and text it can also send and receive video, email, live TV, and deliver information and services based on the location of your handset.



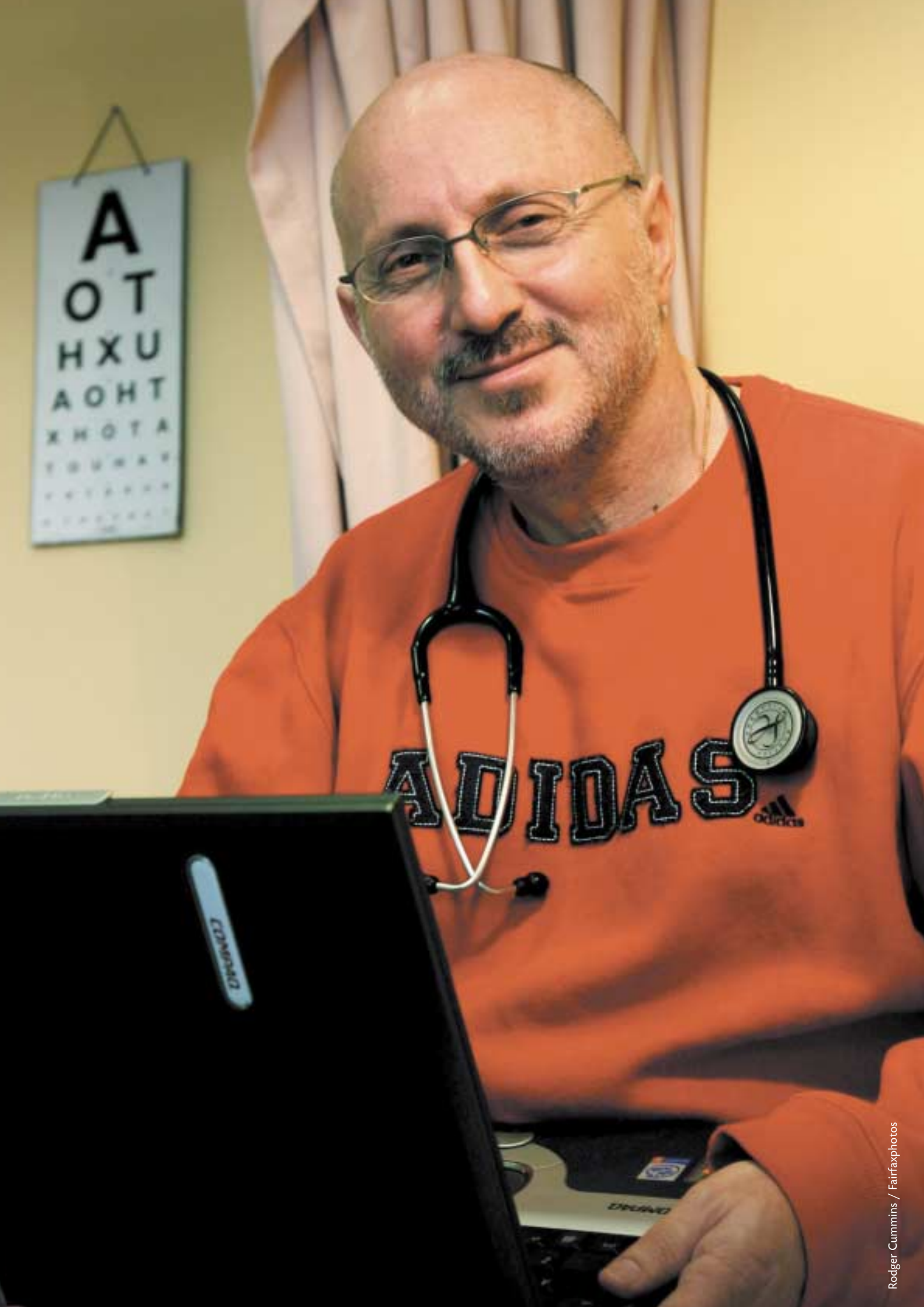
3G technology is to the mobile phone network what Broadband is to the computer industry – both offer dramatically increased speed and major changes in what people can do with the technology

Third generation operates in a different way to 2G digital mobile networks. When a call is made on 2G, a slot or 'line' is held open for the user's conversation throughout the duration of the call. With 3G networks, the data sent across them can be parcelled up into small 'packets' which are reassembled in the correct order at the receiving end. This smart encoding means more data can be sent and it is sent more efficiently.

Some people call 3G, 'mobile broadband' because the evolution is similar to the difference between dial-up internet and the always available broadband internet services.



Doctors and businesses alike can access databases on the move



Rodger Cummins / Fairfaxphotos

3G TECHNOLOGY PROVIDES MANY COMMUNITY BENEFITS

The new features of 3G networks are already providing many benefits in the community. Parents are using the technology to keep in visual contact with their children. People who are hearing and speech impaired are using 3G to communicate using sign language. Vital medical monitoring data is being sent to hospital based specialists by local doctors or emergency services personnel in the field.

3G allows doctors to access patient files while on house calls

Mobile internet has increased the productivity of many medical professionals, but with a 3G high-speed wireless internet connection, doctors can access important patient files more quickly and easily when they are away from their practice.

"The wireless internet offering means I can provide better patient care when outside the practice as I have secure access to real-time patient records, can obtain current pathology lab test results online and respond to urgent emails," Dr Henry Konopnicki, a GP with the Complete Health Group, at Chadstone in Melbourne, who uses the 3G data card technology.

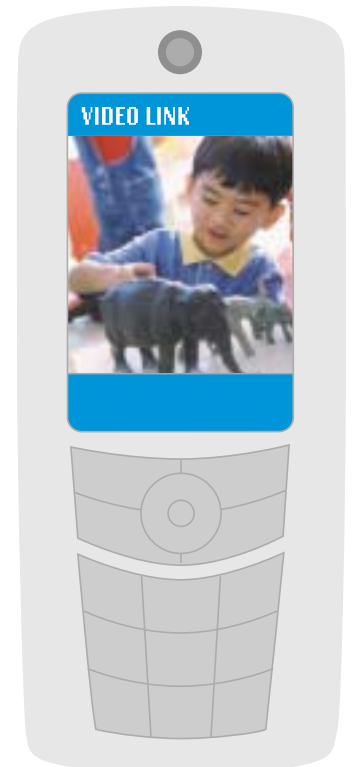
3G technology strengthens communication between parents and children

The Hasaki Hikari Daycare Center in Japan uses 3G video technology to allow parents to check on their children at the centre at any time.

The ability to see the kind of childcare being conducted in the centre gives parents peace-of-mind. As a result there is more communication between the childcare workers and parents when they pick up their children as parents can see for themselves their child's activities throughout the day.

Having parents monitor their children whilst in day care also helps maintain a personal bond with the carers, improving their relationship with the child.

The technology also stimulates conversation at home because parents know what the child did during the day and can discuss it with them.



3G video streaming allows working parents to have contact with their children during the day

Previously, Dr Henry Konopnicki did not have a viable or efficient way, when out and about on house calls, to respond to urgent emails or access patient's medical history or test results.

"I have been so impressed – my colleagues in the Complete Health group are also beginning to see the benefits, evaluating it as a solution to improve patient-facing time," he said.



The ability to send high-speed video images allows those with hearing impairments to use mobile communications for sign language.

3G makes sign language for the deaf easier

Finnish telecommunications company Elisa has initiated a pilot study with the personnel of the Honkalampi Foundation, and the speech impaired who use the Foundation's interpretation service. The pilot simulates situations where people use the interpretation service, such as when they go to the bank. Using a 3G network, sign language is transmitted from the bank counter to a remote sign language interpreter, who interprets the sign language into Finnish and vice versa.

"3G now facilitates wireless video and audio. Thanks to remote interpretation, interpreters are able to serve more and more customers. Remote interpretation via picture phones offers municipalities an affordable way to implement statutory services. Remote interpretation services are targeted at private individuals who need interpretation services, and at different service organisations, such as hospitals, health centres, the police and social offices that need sign language interpretation in their customer service," said Satu Seppäläinen, who is in charge of the interpretation centre in the Honkalampi Foundation.



Employees can work anytime, anywhere within the 3G network using their mobile phone connected to a laptop

Telecommuting with 3G

Telecommuting allows employees to work anytime, anywhere within the 3G network using their mobile phone connected to a laptop computer for fast internet connection. There are a number of benefits for the employee, employer and the wider community.

For the employee:

- No commuting time.
- Lower stress level.
- Greater balance between work and family life.
- Flexible scheduling means time off for personal needs.
- Fewer interruptions lead to more productive work time and potentially fewer work hours.

For the employer:

- Productivity increases with fewer office interruptions.
- Employees can work at their peak times because of flexible scheduling.
- Lower overhead due to less office space, furnishings, and operating costs.
- More appealing work environment and flexibility boost employee morale, attract new employees, and increase employee retention.
- Fewer sick days used for minor illnesses or transport problems.

For the community:

- Reduced pollution and traffic congestion in overpopulated cities
- Transportation savings for the city
- Productivity gains



3G IS BEING DRIVEN INITIALLY BY BUSINESS CUSTOMERS

The rate of introduction of 3G networks is being driven by increasing customer demand, which initially came from business customers looking for attractive prices, improved services and productivity benefits.

Small to medium sized companies have been the first to realise the benefits of 3G

Small to medium sized companies have been the first to realise the benefits of 3G. RSP Group, a recruitment firm, brings employers and candidates face-to-face using

video calling on the 3G network. "Body language is a huge part of human communication – a picture speaks a thousand words. When your job is to assess and communicate a candidate's personality or a client's culture, being able to see as well as hear a person early on in the process makes life a whole lot easier," Chief Executive Officer, Matt Lodge said. "A client hiring interstate can, for instance, do the first round of interviews by phone rather than having to fly in."

Shop fitting company Digitalkarma in Sydney use 3G video calling capabilities to show each other the status of projects and to collaborate on solutions to problems as they arise. A problem that would have taken five minutes to explain is now shown in seconds.

Similarly, Melville Gray Truck Repair Specialists in Perth use 3G technology for video repair diagnosis.

3G offers new ways to create loyalty and improved customer service. For example, it is possible to ring a hardware store and show them the part of the sink that is broken.



Video diagnostics create new ways of sharing expertise, taking customer service to a new level

Recruitment firm RSP Group use 3G technology to bring employers and candidates face-to-face.

"The clients love it, and the candidates love it too because it enhances the way they can present themselves. It saves the client's time, the candidate's time and our time," CEO Matt Lodge said.



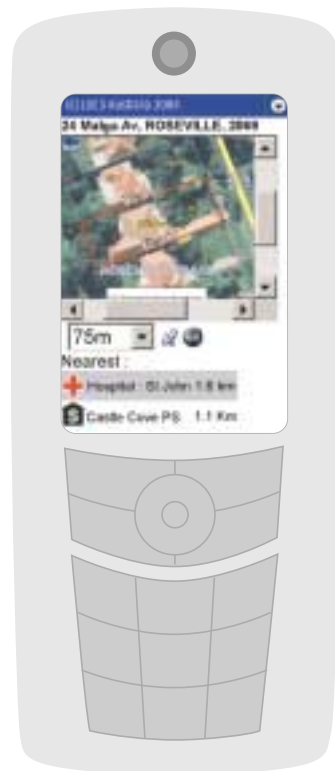
3G services increase productivity in the real estate industry

With more than 3000 real estate agents across Sydney, competition for new listings is fierce. To ensure a competitive edge, Dural First National became early adopters of Loc3, the first location-based mobile data service for the real estate industry.

By entering the required location into Loc3, agents can use 3G phones to download maps and aerial photos of houses, call-up sales histories, current listings, appraisals, forecasts and calculate distances from points of interest such as schools, shops and transport while on location with a potential vendor.

Since introducing the technology, sales agents are around 25 per cent more efficient and vendor listings have been secured more easily.

“The 3G phones running Loc3 have saved us at least two hours a day by enabling agents to download, enter and send data at high-speed in the field and generate reports on the spot,” said Pauline O’Neill, Principal Sales, Dural First National.



Loc3 means agents have instant access to information on any listed property, saving time for their customers. Agents can also update information on the fly.

3G SERVICES IN EVERYDAY LIFE

Being optimised for data, as well as voice, 3G phones can be used for most of the functions currently performed on a computer, such as accessing the internet.

Third generation phones provide access to video news, weather, sport and entertainment, including MP3 music and movie trailers. Many other useful services such as being able to book a hotel room electronically and planning travel routes and times will soon be available.

3G could provide more accurate traffic information

The Road Traffic Authority in NSW currently provides traffic reports on the internet 24 hours a day, 7 days a week. The service provides accurate, timely information to assist trip planning and manage travel demand.

Also, the Transport Infoline in Sydney and Metlink in Melbourne offer information on their website about public transport delays and service alterations.

By accessing this information with 3G phones, it would be possible to immediately find out about delays in public transport, road accidents or roadworks.

A potential development in the future would be to offer these services based on the location of the 3G phone. It means customers would only receive information that relates to their travel plans and it would be possible to calculate how much travel time is left, both when travelling with public transport, car, walking or cycling.



In Hong Kong, a service known as ‘Trafficam’ shows traffic jams on major roads, allowing users to save time and ease congestion by choosing alternative routes

... and help with travel planning

In Melbourne, Connex has introduced SMS Timetables, which means travellers can have personalised timetable information sent via text message at any time of the day.

With the greater transmission capacity that 3G provides, in the future travellers will be able to receive maps with information about temporary changes to stops and re-routing information. If a customer wanted to find the closest train station and how to get there they could request this information be sent to their phone.

3G customers have more fun

With the speed of 3G, customers can access and download a range of games, easily and quickly. 3G offers great potential for improved graphics, sound and depth, giving customers a more intense gaming experience, including 3D.

Due to 3G, Australia already has fast live multiplayer mobile games, which allow customers to play against other 3G customers in real time.

3G customers can watch video highlights of many sports and obtain alerts offering the opportunity to watch a video replay



Surfcam

Code	Last	\$ +/-	Bid	Offer	Open
AEN	1.050	-0.010	1.040	1.050	1.050
AES	0.062	0.000	0.061	0.062	0.000
AGL	13.810	-0.140	13.800	13.800	13.990
ALN	8.150	-0.170	8.150	8.160	8.300
APA	4.000	0.150	3.990	4.000	3.840
DUE	2.520	0.040	2.520	2.530	2.450
ENE	3.680	-0.020	3.660	3.720	3.690
ENV	1.120	0.010	1.110	1.120	1.120
EVM	0.290	-0.020	0.290	0.305	0.310

"Live" financial updates

3G takes television to the next level

3G customers can access news and real-time financial information, television programs, movie trailers, sporting events, and music videos.

In Australia, 3G customers can watch video highlights of many sports, such as cricket. Customers can obtain alerts telling them when a wicket has fallen and offering the opportunity to watch a video replay. They can use their 3G mobile to get ball-by-ball scores and to analyse match statistics.

Using the video stream capabilities of 3G, surfers can check out East Coast surfing conditions using 'Surfcam'.

Personal safety also increases with 3G

One of the main reasons people took up analogue and digital mobile phones so rapidly is the personal safety benefits mobile phones offer.

SureLab is an Australian security service provider that has enhanced its services by using 3G technology. SureLab has developed a video security application that streams video to a user's mobile phone in addition to SMS or picture message alerts when an intruder is detected by the system. The SureLabs system also allows parents or business owners to login and view their children or business via their mobile device using real-time video streaming.



Security video streaming

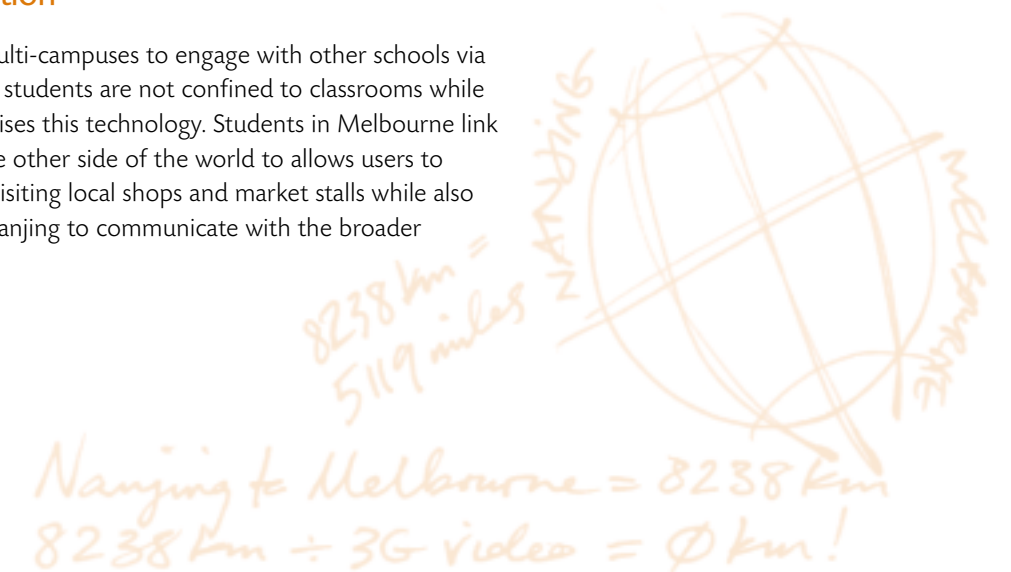
Parents and business owners can view their children or business via their mobile device using real-time video streaming

Finding a restaurant or bar

3G customers can look up restaurant and bar reviews on their phone. They can choose the city they're after, click on the style of restaurant or bar they're interested in, select the price range, and then let the mobile phone do all the hard work. Customers can also search for restaurants by cuisine or suburb to find out about the latest hotspots.

Better connected education

3G enables schools that have multi-campus to engage with other schools via live video streams, which means students are not confined to classrooms while learning. Caulfield Grammar utilises this technology. Students in Melbourne link with the Nanjing Campus on the other side of the world to allow users to explore the streets of Nanjing, visiting local shops and market stalls while also enabling staff and students at Nanjing to communicate with the broader Caulfield Grammar community.





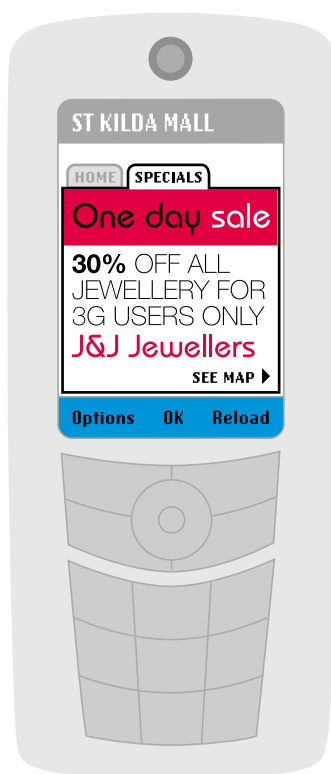
3G will revolutionise the way we shop

If you are with a friend who recommends a new book and you decide that you want to buy it, you no longer have to wait until you are out shopping. With 3G, you can use your mobile phone to compare prices and find the most competitive deal and then purchase the book on your mobile phone straight away.

3G will also allow retailers to interact with their customers at the point-of-need and personalise information. For example, a 3G customer could enter a clothing store and be informed of their previous purchases and what new clothes are available in that area. Once they have decided to purchase something they will be able to buy the item using their 3G phone on-line directly with the store without having to line up at a cashier's station. They will also be able to pay for the items with an electronic wallet, or perhaps through their mobile phone bill.

A recent survey by global technology consulting firm Accenture, looking at both US and UK mobile telephone and personal digital assistant (PDA) users, found that one-in-ten of the phone customers and one-in-four of the PDA owners had already used their devices to buy goods.

You can use your mobile to compare prices and find the most competitive deal – then purchase on your phone straight away



3G allows retailers to alert you of special deals tailored to your needs when you are nearby

Laws protect consumers' privacy

For those who may be worried about privacy, there are laws and regulations in place in Australia to help prevent unsolicited mail or SPAM.

For a company to be able to send information to a 3G mobile phone, the customer must first opt into the service to receive messages and information. Unlike internet e-mail, in which a user logs onto a site and the information can then be passed on to mailing lists, carriers will not sell their customers' information.

ALL AUSTRALIAN CARRIERS ARE INSTALLING SHARED 3G NETWORKS

In other countries where the introduction of 3G networks is well underway, such as in Japan and the European Union, consumers and businesses are benefiting significantly from the lower prices, expanded opportunities and improved efficiencies of 3G networks. For Australia to remain competitive in the global marketplace, it must also provide 3G services for Australians.

All Australia's existing mobile carriers have already installed or have plans to install 3G networks in order to provide these new services to Australian customers. 3G has initially been deployed in metropolitan areas.

Telstra launched new services in March 2003 utilising enhanced data speeds on the existing CDMA network. Hutchison launched its 3G network in April 2003.

However, all carriers are taking a more consolidated approach to future 3G network building requirements. In August 2004, Telstra and Hutchison announced a 3G network sharing agreement, which commenced in January 2005.

Through the sharing agreement, Telstra gains access to the Hutchison 3G network from July 1, 2005. Both companies expect to increase the size of the

combined 3G network over the next three years, whilst substantially reducing the total number of base stations required.

Also in August 2004, Optus and Vodafone Australia announced an agreement to share 3G network sites and radio infrastructure, which will similarly reduce the number of base stations required. Rather than

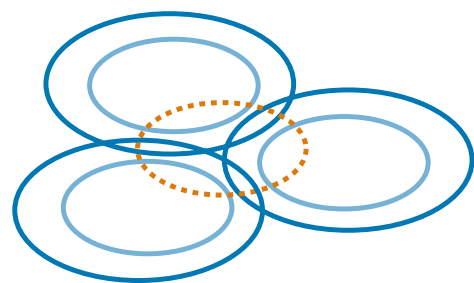
building new sites, wherever possible, Vodafone and Optus will re-use existing sites from their combined pool of existing 2G sites. Their shared 3G network is expected to be operating by the second half of 2005.

In Japan and the European Union, consumers and businesses are benefiting significantly from the lower prices, expanded opportunities and improved efficiencies of 3G networks

The Australian Communications Authority regulates the mobile phone industry

All operators, including telecommunications carriers, must comply with the standards set by the Australian Communications Authority (ACA) as required through the Radio Communications Act 1992 and the Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2003.

It is more efficient to send 'packets' of data using 3G's smart encoding, so 3G base stations operate with less power than 2G base stations



- 2G cell size
- 3G cell size
- Extra 3G cell to cover "hole"

These science based standards are recognised by national and international health agencies around the world as providing ample protection for people living or working near a mobile phone base station.

3G will need some more cells, but operate with less power

Third generation networks operate on the same radio-wave basis as existing mobile networks though at a higher frequency. Because the range of radio waves decreases as frequency increases, the range for each 3G base-station is smaller than the earlier analogue or digital base-stations, which mean more 3G base stations may be required to cover the same area. This also means the choice of available sites for 3G base stations is smaller.

However, because it is more efficient to send 'packets' of data using 3G's smart encoding and because of the smaller area covered, 3G base stations operate with less power than 2G base stations.

In Australia, much of the need for 3G services will be met by adapting each carrier's existing network of base stations. Also, through the Mobile Carriers' Forum, carriers will co-locate 3G base stations whenever possible. However, new 3G base stations will be required to fill the gaps in service created by the smaller range of each 3G base station.

The antennas for the new services will look very similar to those on existing base stations, but they usually don't need to be as high. Where a carrier has an existing digital base station they will install 3G services on the existing base station.

The Australian Communications Authority has produced a fact sheet on 3G mobile phones, which explains that the electromagnetic energy emission levels produced by 3G transmitters are low. The average power is significantly lower than the power levels of some other common types of transmitters, such as two-way radios used by taxis and emergency services. On average, a 3G mobile phone base station antenna emits a little more than one tenth of the power of a taxi's two-way radio.

In response to community concerns about base station deployment, the Australian mobile phone industry, in conjunction with local councils, community groups, the unions and the government, has developed a code-of-practice which covers the siting of mobile phone base stations.

The code requires mobile phone carriers to take a precautionary approach. They must: have written procedures for site selection; improve notification and community consultation procedures; design and operate base stations with the objective of minimising electromagnetic emissions; and, provide electromagnetic emission reports as per the Federal Department of Health's requirements.

CAMERA AND VIDEO PHONES: FUN WHEN USED RESPONSIBLY



While camera phones provide people with the flexibility to make a phone call, and instantly take and transmit a photo, the Australian Mobile Telecommunications Association (AMTA) requests that the devices are used responsibly.

The recording and imaging capabilities of small devices is not new – micro digital cameras have been available for some time. However, it is important that people remember the same rules apply to all devices that record images, whether they are cameras, or phones equipped with cameras.

For this reason, AMTA recommends the following consumer tips and requests that every camera phone user follows them:

"Users should always respect the privacy of others"

- 1 Camera phone users should always respect the privacy of others.
- 2 Users should always respect areas considered "private" by those who use them, for example: bathrooms, changing rooms, and gym locker rooms.
- 3 Users should always respect the sensitivity of many office and industrial environments where the viewing of proprietary materials is a concern.
- 4 Users should respect areas of photographic sensitivity, for example: museums, movie theatres and live performances.
- 5 Camera phones should not be used to take photos of individuals without their knowledge and consent. Special discretion is advised when using your camera phone to take photos of persons under 18 years of age.
- 6 It can be dangerous and possibly illegal to use camera phones while operating a motor vehicle. It is also illegal to send messages which would be regarded as harassing, menacing or otherwise offensive.

WHAT DOES 3G MEAN FOR AUSTRALIA?

“3G captures the imaginations of both governments and individuals alike because of its capacity to drive our economic growth, transform our businesses and improve services to our communities.”

“New and innovative technology such as 3G captures the imaginations of both governments and individuals alike because of its capacity to drive our economic growth, transform our businesses and improve services to our communities.

The limits the Federal Government placed on the 3G license auction ensured the introduction of four new competitors in these spectrum bands promising to deliver benefits for users as a result of more competition - and in turn a wider range of services, more innovation, and increasing price competition.

I commend the carriers on their decision to share 3G infrastructure to limit the duplication of networks and subsequently the impact on the community.”

Senator Helen Coonan, Minister for Communications, Information Technology and the Arts

“3G is changing the way Australians communicate with each other – in the community and in business. Doctors are using 3G to improve patient consultation when out of the surgery; schools are using 3G to communicate between international campuses and to improve learning; people with hearing disabilities are using 3G to communicate via sign language; and businesses are improving customer relations and increasing productivity through 3G.

In the near future 3G will be considered an essential communication device for many Australians. Equally, the importance of building the infrastructure required to provide these leading edge services to the community must be recognised.”

Tanya Stoianoff, Executive Director, Mobile Carriers Forum

“Time savings generated through the use of technologies such as 3G improves both the profitability and professional appearance of the business.”

“3G provides opportunities for non-office bound staff of small businesses to resolve problems, transmit orders or lodge plans and drawings on-site. Ready access to maps and product data-bases reduces travel time and can speed up business activities, including ordering. The visual component reduces guesswork. Time savings generated through the use of technologies such as 3G improves both the profitability and professional appearance of the business. A small investment can reduce the competitive advantage enjoyed by much bigger businesses.”

Ewan Brown, Executive Director, Small Enterprise Telecommunications Centre Limited (SETEL)

“3G takes the data transmission capabilities of 2.5G technology and turns up the pace by up to ten times.

Additionally, the electromagnetic energy (EME) emission levels produced by 3G transmitters are considered low in comparison to many other common types of transmitters, as adaptive power control and small 3G cell size significantly reduce the radiated power levels of this technology.”

Ian McAlister, Australian Communications Authority

“There is strong evidence from Australian Industry Group research that use of advanced telecommunications provides real business advantages.

Advanced technology makes a significant contribution to improving business performance by delivering higher levels of efficiency and productivity.

This benefit to business has the potential to be significantly enhanced as the broader community uptake of higher levels of technology grows.”

Heather Ridout, Chief Executive, Australian Industry Group

“Schools are using 3G to communicate between international campuses and to improve learning; people with hearing disabilities are using 3G to communicate via sign language.”

FURTHER INFORMATION

Carriers

Vodafone www.vodafone.com.au
Telstra www.telstra.com
Optus www.optus.com.au
3 www.three.com.au

Mobile Carriers Forum

Tanya Stoianoff, Executive Director
Suite 603
Level 6, 46 Market Street
Sydney NSW 2000

Phone: 02 9279 0533
www.mcf.amta.org.au

Australian Mobile Telecommunications Association

Graham Chalker, Chief Executive Officer
PO Box 4309 Manuka ACT 2603
Phone: 02 6239 6555
Fax: 02 6239 6577
www.amta.org.au

Department of Communications, Information Technology and the Arts

38 Sydney Avenue Forrest ACT 2603
Phone: 02 6271 1000
www.dcita.gov.au

Minister for Communications, Information Technology and the Arts

Parliament House
Suite MG70 Canberra ACT 2600
Phone: 02 6277 7480

Australian Communications Authority

Central Office
Purple Building, Benjamin Offices
Chan Street Belconnen ACT 2616
Phone: 02 6219 5555
www.aca.gov.au

Australian Communications Industry Forum

Nokia House
Level 9, 32 Walker Street North Sydney NSW 2060
02 9959 9111
www.acif.org.au

Telecommunications Industry Ombudsman

PO Box 276
Collins Street West Melbourne VIC 8007
03 8600 8700
www.tio.com.au



Mobile Carriers Forum

Suite 603
Level 6
46 Market Street
Sydney NSW 2000

www.mcf.amta.org.au

