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Official Committee Hansard

HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON COMMUNICATIONS, INFORMATION TECHNOLOGY AND THE ARTS

Reference: Wireless broadband technologies

TUESDAY, 9 JULY 2002

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HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON COMMUNICATIONS, INFORMATION TECHNOLOGY AND THE ARTS

Tuesday, 9 July 2002

Members: Mr Pyne *(Chair)*, Mr Hatton *(Deputy Chair)*, Mr Baldwin, Mr Ciobo, Ms Grierson, Mr Johnson, Mr Pearce, Mr Sercombe, Mr Tanner and Mr Ticehurst

Members in attendance: Mr Ciobo, Ms Grierson, Mr Hatton and Mr Ticehurst

Terms of reference for the inquiry:

To inquire into and report on the current and potential use of wireless technologies to provide broadband communication services in Australia, including regional Australia, having particular regard to the following:

- The current rollout of wireless broadband technologies in Australia and overseas including wireless LAN (using the 802.11 standard), 3G (eg UMTS, W-CDMA), bluetooth, LMDS, MMDS, wireless local loop (WLL) and satellite;
- The inter-relationship between the various types of wireless broadband technologies;
- The benefits and limitations on the use of wireless broadband technologies compared with cable and copper based broadband delivery platforms;
- The potential for wireless broadband technologies to provide a 'last mile' broadband solution, particularly in rural and regional areas, and to encourage the development and use of broadband content applications;
- The effect of the telecommunications regulatory regime, including spectrum regulation, on the development and use of wireless broadband technologies, in particular the Radiocommunications Act (1992) the Telecommunications Act (1997), and Parts XIB and XIC of the Trade Practices Act:
- Whether Government should make any changes to the telecommunications regulatory regime to ensure that Australia extracts the maximum economic and social benefits from the use of wireless broadband technologies; and
- Likely future national and international trends in the development and use of wireless broadband technologies.
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WITNESSES

Committee met at 8.58 a.m.

ACTING CHAIR (Mr Hatton)—I declare open this meeting of the House of Representatives Standing Committee on Communications, Information Technology and the Arts. Our first item of business is to receive submissions.

Resolved (on motion by **Mr Ticehurst**):

That the committee receive submissions numbered 46 to 52 as evidence and authorise the submissions for public release.

The second item of business is in respect of the Chair. At the moment he is in Adelaide with his wife, who is having a baby, and our thoughts are with them.

Today the committee will take evidence as part of our inquiry into wireless broadband technologies. In simple terms, broadband allows for high speed data transfer, providing vastly improved Internet access with a far higher level of interactivity. Broadband also enables services such as digital video on demand, simultaneous phone and data, and a range of applications and content that can reduce the cost of doing business and delivering government services. Wireless technology can be used to provide broadband services over the airwaves thereby providing unwired networking services mobility and convenience for business users, an alternative to existing wired networks and a new range of specialist applications.

The committee is examining current wireless broadband technologies in Australia and overseas and the likely future national and international trends in their development and use. We are looking at the interrelationship between the various types of wireless broadband technologies and examining their benefits and limitations compared with cable and copper based broadband delivery platforms. The committee is particularly interested to explore the potential for wireless broadband technologies to provide a last mile broadband solution in rural and regional areas, that is to connect businesses and households which are currently unable to receive broadband services. We are looking at how wireless technologies can encourage the development and use of broadband content applications. In addition, the committee is examining the effect of the telecommunications regulatory regime, including spectrum regulation, on the development and use of wireless broadband technologies.

[9.01 a.m.]

BLACKSON, Ms Robin Anne, Executive Officer, Community Services, Australian Communication Exchange Limited, through Ms Pamela Erica Spicer, sign language interpreter, Queensland Deaf Society

BYTHEWAY, Mr Leonard Brian, Chief Executive Officer, Australian Communication Exchange Limited

McCAUL, Dr Thomas Forrest, Research Manager, Australian Communication Exchange Limited

ACTING CHAIR—Although the committee does not require you to give evidence under oath, I should advise you that the hearings are legal proceedings of the parliament and warrant the same respect as proceedings in the House. The giving of false or misleading evidence is a serious matter and may be regarded as contempt of parliament but we have found very few people have actually had any problems with that so far. Do you wish to make some introductory remarks before we proceed to questions?

Mr Bytheway—We have a small presentation that gets us started if that is okay with you.

ACTING CHAIR—Sure.

Mr Bytheway—I will pass to Tom McCaul.

Dr McCaul—I will start with what we do. The Australian Communication Exchange is a community-based, consumer led, not-for-profit organisation. We provide services to Australians who have a hearing, speech or communication impairment or difficulty or who are deaf. We have provided these services since 1984. We provide the National Relay Service under contract with the Commonwealth government, and we are approaching four million relay calls since 1995. We also established the world's first national text based emergency call service. We employ around 200 staff specialising in telecommunication and access services for people with a disability. We are an active participant in telecommunication research for people with disabilities, which includes the Deaf Australia Online projects. We have liaised with international agencies which may include Typetalk UK and other United States relay services—for example, the Maryland Relay Service. We participate in government and industry forums relating to telecommunication access, for example, the National Relay Service forum which is organised by the Australian Communications Authority.

Ms Blackson—Perhaps I could provide some background as to why we work for this organisation, the Australian Communication Exchange. It is important for you to realise where we come from. As you know, Tom McCaul has a hearing impairment. He has a strong research background and has done a lot of research in video interpreting and mobile telephone text. He also has a lot of the responsibility for customer satisfaction surveys through Australian Communication Exchange with the NRS. His preferred method of communication, as you can

see, is through voice or, when he is on the telephone, he will go through voice carryover—that is through the National Relay Service—or SMS or the Nokia Communicator.

Len Bytheway is obviously a hearing person. His qualification is from Auslan schools and he is one of the founders of Australian Communication Exchange. He has worked in the field of disability access telecommunications for the past 17 years. He had a Churchill Fellowship in 1988 and last June went on a study tour to the USA and England, looking at other relay services and future directions.

Telephone access is about freedom of choice; it does not matter how. I am a deaf person. I can use my voice but, in situations like this, I prefer to use Auslan—Australian sign language. I am the Executive Officer of Community Services and I am responsible for 20 people. I have an outreach program to educate and inform people about the National Relay Service, including people who are deaf, hearing impaired or speech impaired. It is our job to make sure that they are aware of and use the National Relay Service. My preferred communication methods are the TTY, which I assume you are familiar with, the National Relay Service and mobile phone text as well. I will pass back to Len now.

Mr Bytheway—I might take the opportunity now to move through, very briefly, a summary of the issues that we have brought in our paper, if that suits your needs. I think it is also important that we brought people who have skills and who actually use these sorts of services and systems that we are discussing here.

CHAIR—It gives a very balanced presentation when people are speaking from direct experience. It is very useful to us.

Mr Bytheway—Australian Communication Exchange or ACE, to make it easier, is actively seeking to explore and exploit the benefits of emerging technologies for people with a disability. We see it as a very exciting and, potentially, a great advantage for the future. However, we are also gravely concerned that the benefits of these sorts of potentials will not be realised if we do not go through a process of consultation and consideration before we go straight to implementation. There are some great benefits, but those benefits are often not translated into direct profits and so they may not be the priorities of those delivering the new technologies to us. So we have some concerns that we need to view these potentials not just as a way to make money for a few but as a way of enhancing the social directions for Australia and enhancing the opportunities for all Australians to participate. There is a great potential but also a great risk.

The issues as seen by Australian Communication Exchange include, first of all, the concept of any-to-any connectivity, which is a key plank of all telecommunications in the voice arena. Any-to-any connectivity needs to be extended to include the needs of people with a disability so that we do not have devices that work on one platform but cannot communicate with devices that work on another platform. That is the probably the most fundamental aspect of the concerns that we have. To make that happen we need to consider the importance of customer equipment and the kinds of equipment that are being issued or distributed. There is a close relationship between the network that delivers the information and the equipment that plugs into that. Again, that consideration needs to be brought out up front. Typically, in the industry people will say, ‘I deliver bandwidth, I deliver a network, I deliver handsets,’ and yet, for people with disabilities,

the integral link of those is critical to the future and cannot be separated and made into separate business activities.

We have a serious concern about the backward compatibility to what I call legacy telecommunications equipment used by, in particular, deaf people. I do not know if you are familiar with the TTY—it has probably been raised—but it is based on the Baudot technology which was taken up by the deaf community in the early 1960s. It was rejected as old technology by the rest of the world and therefore there was a free piece of equipment lying around unused. We are now trying to build 21st century technology which is backwardly compatible to technology that was rejected in the early 1960s. Needless to say, that causes us a great deal of pain and we need to look at directions which break that link from those legacy technologies.

Tom mentioned that we deliver the world's first text based emergency call service which has given people with a disability in Australia unprecedented access to basic emergency call services. It is equivalent to 000. Yet some of the directions we are moving in now, particularly in the deployment of wireless local loop and Internet based telephony, will completely cut off access to that service for large chunks of Australia. We are looking at holes in the fabric of the telecommunications emergency network which we have spent so many years getting right, and is now about to be damaged. I mentioned there are impacts of evolving technologies like IP telephony, wireless local loop and 3G that relate to both this backward compatibility and the ability to access key services.

As you have seen from the people before you today, different people use different modes to communicate. Tom uses his voice to communicate forward but needs text coming back so that he can understand what is being said or sign language. Bobby, on the other hand, uses either sign language in both directions or text in both directions. Whatever we put in place needs to acknowledge that there is a wide range of skills and communications modes that are being used by people with disabilities and, we cannot just assume that SMS text is going to be enough for everybody. It certainly is not adequate for everybody and yet, there are those that would suggest that is the case.

Interestingly, an important issue for us is the concept that all emerging technologies need to be linked to international standards. As we all know, Australia is a very small part of the international scene. The customer base that we have, when you break that down to the people with disabilities, is very small, and we will never have a commercial force to bring about change in itself. International standards means that equipment designed for the mainstream population can also be deployed with people with disabilities, and therefore economies of scale are brought into place. Therefore, Australian Communication Exchange strongly supports the use of international standards based technologies, specifically the H series technologies for video conferencing—H 323 for example. Or, in the case of text communications, the V.18 standard which is slowly being deployed in Europe. You may be aware that Australian standards ASNZ 4277 recommended in 1995 that V.18 be the standard for Australian text telecommunications, and we are still talking about it today. At that time, it was an evolving standard that had no actual hardware to deliver it. Now hardware is available and there is no impediment in us moving to true international standards based delivery of services.

Moving specifically to the broadband related issues, we see great potential in broadband to increase communications for people with disabilities. The most obvious one is the delivery of

sign language person-to-person. The kinds of things that you can sign in a minute with expression, understanding and emotion and all the sorts of things that we would expect from any communications, would take 10 or 15 minutes to type in a way that deleted all of that additional information. Sign language is a very efficient and personal way of expressing a great deal of information, whereas typing that text is not an equivalent in any way. It is much more time consuming, particularly if you are looking at punching it out on an SMS keyboard limited to 160 characters per message at 25 cents.

So sign language is an obvious one that we see, but it can also go a step further. We can have sign language through a video relay service. Interestingly, in the USA the FCC has just passed instruments to allow Internet relay and Internet video relay to be funded under the interstate relay fund, so now, in the USA, video relay services will be delivered using broadband and will be funded through the government funding process there. They estimate that, in the first 12 months of the video relay service in the USA, there will be in excess of a million telephone call minutes relayed using video relay interpreting, which is a phenomenal amount.

In the past seven years of the Australian National Relay Service, we are just about to approach our four millionth call—to give you some sort of comparative position. We also have to recognise that the potential for video is much greater than just for people who are deaf. The population of Australians who use sign language is relatively small. The population of Australians who have a significant hearing impairment which affects their telecommunications is much larger, and I notice that in previous hearings quite a few figures have been put before this committee so I will not attempt to replicate those.

Many people who can hear some and speak for themselves find the regular telephone quite a challenge. There are a number of potentials that broadband could offer us. One is that we could look at delivering video so that we can use lip reading as a supplement. For people who can see the face and hear some of the sounds, it is a very important supplement; you get body language, facial expressions plus the lip patterns. For possibly hundreds of thousands of Australians that may be a viable option in the near future, something that we must not overlook.

Likewise, the speech of people with speech disabilities, who may find typing incredibly tedious because of other physical disabilities, is very difficult to understand. But, if you are physically sitting with that person and they use a range of body gestures, articulations and so on, and you can see lip patterns so that words can be mouthed even if the sounds cannot be made, often the speech of that person with a speech disability is significantly easy to understand. We anticipate that video facilities will allow people with speech disabilities to communicate much more effectively using broadband technologies.

The other issue is that the capacity of broadbands to deliver both text and speech at the same time is also quite important. I envisage that in the near future we can have a phone where people can speak and listen at the same time, using what residual hearing they have with the aid of volume controls, hearing aids, inductive loop systems and so on within their hearing aid and supplementing that with text being delivered concurrently along that. It can probably be done using an Internet protocol layer running along the same voice channel through a relay type service where they can have text delivered and speak and listen at the same time. It adds that extra bit of confidence and information to facilitate voice communications. I have seen those kinds of technologies working in the US and in the UK, and I believe that representatives of

TEDICORE are coming later today and will talk about some very exciting projects in Europe, particularly the WISDOM project, where these sorts of technologies are delivering great things for people with disabilities.

The only message I have is that we see great potential for people with disabilities. The sorts of technologies we are talking about are real, alive and working right now in other parts of the world. They are being delivered in a domestic and commercial way rather than just in research projects, but they do require that Australians have access to broadband. In the case of Australia, particularly, which is such a large, geographically diverse place, the notion that a person in a rural, remote area is going to get access to DSL technology under the current deployment of copper and so on is highly unlikely, I would imagine. These sorts of infrastructures need to be put in place in a way that recognises the needs of people with disabilities and that is an affordable and cost-effective way of getting this information out. As a closing point, we are not talking about a handful of people who use sign language; we are talking about a significant portion of all Australians in the next few years.

Mr TICEHURST—How big physically is this TTY equipment?

Ms Spicer—Probably no larger than the average ladies' handbag, that sort of size, and it weighs about three kilograms. It is not something you can easily put in your pocket.

Mr TICEHURST—Why is it that they would work on the AMPS system? I guess they are normally designed to work on a fixed link rather than mobile; would that be correct?

Mr Bytheway—We have to draw the separation between the device, which in this case is the TTY, and the technology it uses. In Australia our TTYs work on this very old system called Baudot which runs at a very slow transmission rate of 50 baud. That technology encodes a sound and sends it down the line. The kinds of technologies that are used to enhance the signals and make them more efficient in digital mobile networks basically scramble the TTY signal when it is sent down the line. What happens is that when we take a signal, we convert it from text to sound pulses, which we send down the line. Digital signals compress those to make them easier to get across and they also reduce what they think is noise. A lot of that noise is in fact important carrier information, so when it comes out the other end it does not come out as text again; it comes out as jumbled text.

Mr TICEHURST—Is it a serial type link, an RS232?

Mr Bytheway—No, basically it is an acoustic link or a direct connect. As I say, that is a particular kind of TTY. If you go to the UK, for example, they have what looks like an identical box but they are running either V.18, which is a broad selection of different protocols which means you can choose the one that best suits the media or, more commonly, V.21, which means that it does not scramble across those sorts of lines. It is not the physical box so much as the protocol it is using to communicate.

Mr TICEHURST—The reason I ask is that we had some equipment running, an RS232 and then to run on IP, to go from serial to IP, was a matter of getting a small plug-in device. It is essentially like a modem. I was wondering whether you could use another device instead of a modem and then you might be able to use it, but then you said that this gear was out of favour

in the sixties yet towards the end you spoke about the idea of having vision, speech and text together. If you look at the hand-held devices that I think are operating in Japan, is that the sort of thing you would envisage into the future—a hand-held visual and some sort of an earpiece to pick up the sound?

Mr Bytheway—I envisage that for people with a disability we will have a range of devices available to them that will let them use whatever communication mode is effective for them. So in the case of a person who uses sign language, a video link may be appropriate. For a person with a severe physical disability and a speech disability, that may not be an appropriate mode; they may, for example, still require a text type device. I hope we will have a range of devices which all interwork with each other—and that is the key to the whole thing—and facilitate the use of the most efficient and effective communication modes so they can talk to the rest of the world.

Let me give you a specific example. The National Relay Service facilitates communications between people who are deaf and blind, and the broader community. To do that, they have a device which plugs into the telephone line; they type on a regular keyboard and send out text. When the text comes back, it is converted into braille; there is a refreshable braille screen at the bottom, which is literally little plastic fingers that jump up and down and make braille cells. You would think that that is very limiting technology: they can only have 20 characters across, and it is very slow and tedious. But you have to stop and think how incredibly enabling it is for a person who is locked in the deaf-blind world to now be able to use the telephone network and communicate with virtually anybody out there. In five or 10 years time, I suspect that braille may still be the most viable option for that person, so I am concerned that they still be able to communicate with somebody who is using more advanced, 3G based technology, for example. The question is less about which specific device we use and more about making sure that, as we evolve and merge, all of these different devices are standards based and can all talk to each other, so that people do not get locked into little islands of communication.

Mr TICEHURST—So the communications channel should not be a limiting factor. I am not sure why you said that wireless local loop was going to present problems with some of this newer equipment that is coming around.

Mr Bytheway—At this point in time, the deaf, hearing impaired and speech impaired community have established a wide support network that is based on Baudot technology. Tens of thousands of organisations across Australia have TTYs. Likewise, the National Relay Service and the 106 emergency call service are accessible via TTY. The wireless local loop technology, which is currently about to be deployed by Telstra, is incompatible with all of that. So, even if we had a device that talked using its own protocol, all access to all those support services would be lost. All access to all those infrastructure systems that have been put in place will cease to be unless we put in some kind of bridging system between those technologies. I do not think that everything we build from this point forward should be compatible with the old-fashioned TTY; that is insane—it is why we got into this problem in the first place. We need to build an environment where the old technology can bridge to the new technology.

Mr TICEHURST—If you get the old technology to have an IP output, the problem should be solved. Is that right?

Mr Bytheway—In principle, yes. But the fact is that there are literally tens of thousands of these devices out there; we do not know where we are and we do not know who has them. If we bring in a new system, then they lose compatibility, and that is one of the problems that we have. There are some solutions out there that offer ways of getting around this—in particular, they have a very interesting system in the UK. The V.18 system solves some of the problems with voice telephony.

Mr TICEHURST—I am not familiar with V.18; what sort of protocol is that?

Mr Bytheway—V.18 is an ITU registered protocol. It is an interworking protocol. It takes a whole range of standards for a whole range of different kinds of text telephony devices that have emerged over many years, and talks between two different kinds of technologies. So, rather than being a protocol in its own right, it is a collection of a whole range of different protocols and allows the bridging of those. Let us imagine that I am in Denmark, using a DTMF based text phone, and I want to talk to someone in England who is using a V.21, which is a 300-baud text phone. We cannot talk together; those phones do not communicate with each other. If one of those is a V.18 based device, it will adapt to whatever the other one is and adjust to it.

In the UK, they have put in literally 800 V.18 modems that act as a bridge between any two text telephony systems. Someone can ring in with virtually any kind of system, and it will read the text from that system, communicate back to it, make an outbound call to a different kind of text phone and bridge those two technologies. That is what V.18 is; it is a bridge between a whole range of different things. That is the nice thing about it. The problem here is that we are trying to merge a whole lot of new technologies. If we always have to make them link back to old technology, we are always going to have a problem there. But if we put in intermediary bridging technology, that always allows a backward compatibility and frees people to move up and look at new, emerging technologies. I guess that is the vision we have for the future.

Mr TICEHURST—I congratulate you on your presentation. The three of you have really demonstrated what the problem is and you have done that very well.

Mr Bytheway—Thanks, Mr Ticehurst.

Ms GRIERSON—I would like to say thank you and your submission is very welcome. I have a background to this having been a principal of a hearing support unit for four years. I will not embarrass you with my signed English which is rather rusty now. It is so important that you have made your presentation to us today, because the communication needs of people with disabilities are just as pressing in this world as those of people without disabilities. My experience has been with young people. My experience is also that there are many TTYs out there but young people reject them because they want to have access to technology that is the same as their peer group. Your problem with the mobile is very true. They would love that sort of access. They also need that instant video communication with their peer group. The equipment that we have seen does not have high-resolution so in terms of lip-reading it will not work and even in terms of Auslan and signed English there would be difficulties. Have you had discussions with Telstra or private corporations about the technology and about managing some sort of changeover to wireless technology?

Mr Bytheway—We have done quite a bit of research both independently, within our organisation in our involvement with the Deaf Australia Online projects 1 and 2, and with the international research that we have done by looking at world's best practice and so on. I hope we can get reasonable bandwidths—whatever 'reasonable' means. I hate the A in ADSL. I do not like it being asymmetric because the skinniest pipe is the one that determines the performance. VDSL would be nice but let us not get too greedy. Our experience is that, looking at video transmissions across IP connections at 128k, we get effective communications and sign language by optimising the image and by choosing which is important. Interestingly, clarity is less important than frame rate. A blurry image that is fairly smooth is much easier to read.

As a matter of interest, Australian Communication Exchange has videoconference facilities between our Sydney, Melbourne and Brisbane offices which we use on a daily basis. We have deaf staff at all locations. We can type our messages or sit and have a conversation with them and it is pretty obvious which is the most effective. 128k is acceptable; 384k is delightful. From our experience, and looking at what is happening elsewhere, at 128k, with reasonable bandwidth and using not too expensive equipment, you can get acceptable results from sign language. Speech reading is not quite as good but it is improving. I guess we have to build our futures not just on what we see today. We understand that with improving codecs and algorithms it will improve in time. Tom wants to make a comment on this. Tom has been heavily involved with our video research projects.

Dr McCaul—Yes, I would like to reinforce what Leonard was saying. 128k is effective—that is, 128kbpps. As a hearing impaired person, I would prefer to use my voice on the phone as well as using videoconferencing because, as Leonard said earlier, I can use lip-pattern, lip-reading, body language et cetera and I can catch the words through mouth movements. We had a trial of video phones using 128kbpps. It depends on the type of phone of course. With real time the voice comes out at the same time as the picture. With some equipment there is a delay and this is not acceptable. It has to be real time. If deaf people understood how to use videoconferencing, 128 would be okay, but they would prefer 384 for very effective communication using sign language.

Having said that, videoconferencing is excellent because it is a very spontaneous form of communication. You probably know that both TTY and SMS are not spontaneous. You have a string of words, then you have to stop and wait for information to come back to you whereas with videoconferencing you can more or less interrupt any time you want just like a normal phone conversation. So there is some benefit to having videoconferencing. For example, if I, as a staff member, were having a problem using email and I wanted to communicate with staff and there was a difficult situation, it could be easily fixed using videoconferencing because you could interrupt and interact much more effectively.

ACTING CHAIR—We will take a five-minute break so that the interpreter can have a break.

Proceedings suspended from 9.36 a.m. to 9.40 a.m.

Ms GRIERSON—Because we do not have, commercially, a critical mass in terms of servicing a particular group, what do you think would be required from government to assist commercial providers to take on some of these challenges of affordable and versatile access?

Mr Bytheway—We believe in the principle of universal design or accessible design. Too long people with disabilities languished in the technology ghettos of special technology. What we would hope is that as new and emerging technologies are developed the needs of people with disabilities are being incorporated into those designs. In fact, as you identified earlier, the kids do not want to have a big, clunky, ugly device which is a deaf thing; they want to have what every other kid has. I think these emerging technologies in fact will deliver a lot of that because they have the functionality. Ironically, I suspect that Australian Communication Exchange and the kinds of activities, if we are successful in convincing you and the government, may be out of business. What a wonderful thought, seriously.

So the first thing is that we need to actively support the concept of universal design. You may be aware of section 508 in the USA, which says that any government product purchased must be accessible for people with disabilities. All of a sudden the very largest purchaser in the country, in fact the largest purchaser in the world, is now mandating accessible products. That ranges from software to wireless products to buildings—everything. Australia's largest purchaser of IT equipment is still the Australian government. If it were to bring in similar expectations that all products being delivered were to be accessible, that would be a significant market lever to convince manufacturers and importers to bring in products—which are available internationally—which are accessible. So we would strongly urge that as a starting point.

We believe that there are choices made in deployment of technologies. Prior to the deployment of those technologies, we need to consult people with disabilities to ensure that their needs have been incorporated—not after the event. I know you have heard about the hearing aid compatibility issue, the TTY issue with the elimination of the amps network, and so on. They were all after the event. They were too late. The horse had bolted. Often, at the time of implementation small changes can make big differences with accessibility. After it is deployed, retro-fitting those changes can be very expensive. Carriers and commercial interests will make the commercial hardship case after the event because it is too expensive to put in afterwards. ACE has written a paper, which we put before the Australian Communications Authority, which suggested that in the same way as buildings have environmental impact studies so we should have community impact studies done prior to the deployment of any new communications technology which look at not just people with disabilities but people from rural and remote areas. They should look at the general issues—if you like, a checklist of 'Have you considered all of these options before you put out a new product into the marketplace?' In other words, you prove you have done your homework before you are able to deploy a new technology.

We believe that people with disabilities will never be a political force. They will certainly never be a market force. Without the forces of markets and competition, the only option to protect the rights of these people will be regulation. I know it is against the flow but I believe in this specific circumstance the needs of people with disabilities need to be protected by appropriate and specific regulation rather than broad general principles which in fact are unenforceable.

At the moment we have regulation which is too broad and the only other recourse is the Disability Discrimination Act, which requires a person with a disability to take action after the event against usually a large interest with which they cannot compete. So we have a asymmetric power relationship. It costs a lot of money and a lot of resources and energy. People with disabilities should not have to fight for every single thing that they achieve in life after they

have been denied it. That is basically what relying on the DDA does: after you have lost something, you have to fight to get it back. I do not think that is an appropriate way of doing business.

Ms GRIERSON—Could you tell us a little bit more about the Deaf Australia Online project and its potential to adapt to wireless broadband?

Dr McCaul—The Deaf Australia Online projects are two projects that were carried out by Janice Knuckey and Claudia Slegers who are both from Melbourne. The purpose was to find out more about deaf Australians' access to and the effective use of technologies. The first project looked at the problems in terms of accessing technology. There was a second project thereafter which looked at the effective use of such technologies as videoconferencing, video relay services, mobile phones et cetera.

Ms GRIERSON—Is the first project complete?

Mr Bytheway—Yes.

Ms GRIERSON—Is the report available for us.

Mr Bytheway—Yes, it was a 1999 project.

Ms GRIERSON—What about the second stage of the project? Has that been completed?

Mr Bytheway—Yes.

Ms GRIERSON—Both those reports would be useful for the committee. Is it possible to have those?

Mr Bytheway—Absolutely.

Dr McCaul—They are also both available on the web site.

Mr Bytheway—I would just like to pick up on some of the—if there is such a word—'implementable' things. One of the things that Deaf Australia Online 2 looked at was the concept of a video relay service. We actually set up a trial video relay service for six months. That period included the evaluation period. That was exceptionally successful. That was based on ISDN technology, because broadband, cable and ADSL were not readily available. We were particularly looking at the issues and needs of rural and remote people who were deaf who used sign language. The only available technology in those sites was ISDN based and we used 128k ISDN based technologies. Tom did the wrap-up of the report. In essence, it was a stunning success that demonstrated that there was a clear need and it provided a great community benefit. Our concern is that it needs to be funded. There is a project that could rollout from that, particularly if we had broadband wireless local loop or broadband 3G or broadband satellite or whatever we are going to deliver in areas where people are both geographically remote and also isolated through their disability.

ACTING CHAIR—We have had some excellent evidence given to us today. I just want to finish with a couple of things. You mentioned the question of interoperability of different systems. In the computer world that has been a problem for a long time. We have now almost got a standard, with Microsoft monopolising just about everything. The one benefit of that might be that Microsoft for a long time seem to have had a bit of a concentration on accessibility. In what you have used—Microsoft products and others—does that allow for some of the freedom you might expect in the future? You are looking at Internet usage and also at Microsoft providing part of that? Have Microsoft been at all helpful in trying to build new systems for you?

Mr Bytheway—One of the reasons Microsoft have been so obliging with this disability access is section 508, which says that if you want to sell Microsoft products to the US government then they have to be accessible. So that in itself has been a fairly major lever to make them accessible.

Microsoft mostly uses international standards, or the Microsoft version of international standards. We would like to see whatever is deployed being technology or vendor independent as far as possible. For example, NetMeeting, which is a very popular product, is actually H.323 compliant, therefore a non-NetMeeting software application running on a non-Microsoft platform will in fact communicate quite effectively with a NetMeeting device. That is really the sort of direction that we see as being more important. We believe that the kinds of forces that brought Microsoft and others into the accessible fold are probably very important. And as long as they stay with international standards, then it does not really matter what the brand is on the side of the box so much as that it is compatible with standards which we have all agreed upon and we all conform to.

ACTING CHAIR—It demonstrates that in an age of market ideologies having first place, governments still can do things.

Mr Bytheway—Yes, absolutely.

ACTING CHAIR—And necessarily, in this area, you are asking the government to step in and support those international standards and to do more specifically to address the problems. You mentioned the V.18 approach, which could bridge the past and the future. Most of the newer technologies in the computing area have chopped away their backwards compatibility to have greater functionality as they have moved to 32-bit software and so on. Is there a danger that hearing impaired people could be locked into the past unless we have got a V.18 standard adopted in Australia?

Mr Bytheway—V.18 is half the equation. It was mentioned earlier that I have just finished a tour of the US and the UK looking at how they have resolved these very same issues—in fact, they are the hottest issues. Hopefully in the next month or so I will be preparing a discussion paper that looks at some options for Australia's future. V.18 offers a solution in standard telephony scenarios where we have text phone devices connected up to what looks like a telephone port, whether it is a wireless or a fixed line scenario. It does not address the IP issue. However, in the US I saw some very interesting technologies being deployed there right now which bridge IP based technologies with other kinds of technologies—for example, voice on fixed line and TTY on fixed line and so on. I think the solutions that will probably best suit

Australia will be a blend of the fixed line solution—the V.18 type solution—with an IP overlay, which acknowledges and bridges between those two. V.18 is still the key to bringing the bridge between those two technologies.

I think the IP stuff is the answer. I think that is where the future lies because, ironically, the thing that the Internet is best at is text; in fact, the thing it is worst at, at the moment, is voice and video. Ironically the things that most deaf and hearing impaired people are best at is text. And what we have is this bizarre situation where we are taking text, turning it into something that looks like voice, sending it down a voice channel and trying to pull it out the other end and turn it back into text, which IP does exceptionally well. What we need to do is make sure that the massive install base of old technologies is not lost. If you will pardon me dropping some humour at the end, when I was in the UK they made a comment that whilst the European Union is moving in commonality, one of the big issues there is in Europe they drive on the right side of the road, in the UK they drive on the left side of the road and unfortunately you cannot have a phased change.

Mr TICEHURST—That is very good.

ACTING CHAIR—Thank you very much for your evidence today. We could probably go on for another hour of questions but we cannot, of course; we have gone a little bit further in time than we normally would have, but we have other groups to deal with. We appreciate the evidence you have given. The great promise which you have indicated for hearing impaired people and other people with disabilities is that, done the right way, this could be a very liberating thing. As we have noticed in previous evidence given in Sydney, the flexibility and emotional depth and the communicative ability of people using Auslan is great. As parliamentarians we have noted that, and if we can actually add it to our repertoire we would be doing pretty well. Thank you very much. We will certainly take into consideration everything you have told us today.

Mr Bytheway—We have organised for a TTY to be shipped over, so we will show it to you in the next break or when TEDICORE comes in.

ACTING CHAIR—Thank you very much.

[9.56 a.m.]

LEONARD, Mr David Roy (Private capacity)

ACTING CHAIR—Welcome, Mr Leonard. Although the committee does not require you to give evidence under oath, I should advise you that the hearings are legal proceedings of the parliament and warrant the same respect as proceedings of the House. The giving of false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. Do you wish to make some introductory remarks?

Mr Leonard—Yes, I do. I am very pleased to appear before the committee today. It is great to see the government taking an interest in this area. In my introductory remarks, I would like to tell you who I am and talk a little about the Brisbane Mesh project. I have three points that I would like to discuss.

I am currently a PhD student at the University of Queensland in the area of computer science. I am self-employed. About a year ago, I noticed that many community groups were springing up around the world using wireless technology in order to effectively set up large intranets amongst each other. I used some university resources about a year ago to set up a focus point for such a community activity here in Brisbane. The vision behind the Brisbane Mesh project is that of a free access cooperative data network focusing primarily on the residential area, or people of like mind—mostly computer enthusiasts and some ham radio people. It has been likened to a giant intranet. Quite purposefully, from the beginning, the non-commercial nature, a more social nature, of this network has been emphasised.

The greatest attractions of the project are threefold. By using short distance cooperative wireless networking, there is no rental cost for the links, only individual capital expenditure of the equipment at each person's household—around $500 or more. The individual link bandwidth between participants is extremely high—around 100 megabit a second compared to commercial residential offerings of around one or two megabit a second. The third great attraction is that it is actually at your home. As a university student, you do not have to sleep in the laboratories and so on.

As I said, the Brisbane Mesh project currently comprises a large collection of people. Its two primary resources are, firstly, a database of interested participants—a graphical database so that people can enter in their status and contact details for the purpose of organising local or small-scale activities. The second resource is a general discussion list or forums for organising large-scale activities.

I would like to make three points to the committee. The first one is about the nature of wireless noncommercial community groups. The number of these groups in Australia is increasing. This increase is part of a worldwide trend driven by a combination of market forces and technology. These community carrier groups operate as nonprofit cooperatives, realising residential data network infrastructure that, in my view, rivals that of commercial networks such as Telstra and Optus in terms of cost capacity and social appeal.

I understand that every capital city in Australia has at least one similar and active community group operating their own wireless data network. Here in Brisbane, the number of interested and participating sites is growing lineally at a rate of about 800 participants per annum. I have a graph which I will hand to the committee. This quite surprised me—800 people in one year, with very little advertising, simply by word of mouth. These people essentially are keen to have an antenna on their roof pointed at some nearby neighbour so that they can take part in this large, collaborative, cooperative network.

This community is growing quite quickly. It scares me a little because when communities are small, their cohesion is guaranteed by shame based enforcement. When they get too large, this mechanism falters and new enforcement mechanisms are required. The social benefit of the infrastructure embodied in the communities to which I refer is manifold. It is my view that government has the mechanisms to directly protect the collective interests of these larger communities. This problem of growth and fragility is a general one, but I believe the loss of such a maturing community due to this fragility from size would be detrimental to future society.

The second point I want to make is that the commercial and noncommercial nature of the Internet is not clear in law. We are a noncommercial community minded group, yet we are in doubt as to whether some of our actions are legal. Clearly, this is an issue that revolves around the historic evolution of the originally collaborative Internet into today's commodity Internet and the concept of an Internet industry. If arbitrary carriage of Internet traffic across such a community network is considered commercial, the community operators are faced with either expensive carrier licences of around $30,000 per annum or they risk penalties of around 20,000 penalty units per day of operation, under section 42(5) of the Telecommunications Act.

I believe some kind of clarification would help, in light of the increasing number of community carriers that are popping up in Australia and their interaction with the commercial carriers, and even with the nature of the data that they choose to carry. In other words, the current legal atmosphere appears impenetrable to the resource-poor community groups involved, and clarification is necessary to progress in this area.

The third point I want to make is that the ISM bands, the 2.4 and 5.8 gigahertz bands, are heading for a textbook tragedy of the commons situation. Current regulation consists of a class licence with a single power limit, although I understand that much higher power limits apply to different classes of licence.

Spread spectrum devices in these bands are particularly resilient to noise and interference. The practical and observable effect of interference on these devices from noise and other interference and power limits appears as a simple variation in operational range. The distance of useable range shrinks. Thus the legislated power limits are effectively a limit on the maximum range of a device. The current proliferation of consumer devices using this band increases the density of transmitters or devices. The regulatory power limit becomes less effective as the dominant limiting factor becomes interference. I call this the cocktail party effect. If you go to a cocktail party the more people there are around you the louder you have to speak to be able to be heard nearby. In addition, the regulations permit volumetric exploitation of the spectrum through blanketing an area with separate antennas. This could be exploited for commercial use. This leads into the tragedy of the commons scenario.

I will not say that I am an expert in public policy; in fact, I know very little about it. I would imagine that local governments might actively engage their communities to plan and manage use of the public spectrum. I say this because the value of the ISM bands is especially high in these cases because industrial, scientific and medical uses of the band are extremely unlikely to occur in residential areas, which is where these community groups operate. That concludes my remarks.

Resolved (on motion by **Mr Ciobo**):

That the committee receive as evidence and include in its records as an exhibit for the Inquiry into Wireless Broadband Technologies the document received from Mr David Leonard entitled, 'Registered sites @ brismesh.org since 2 July 2001'.

Mr CIOBO—We have had testimonies from a number of people on what you called the cocktail party effect. It details the use of 802.11b and its implications in terms of interference. We have had two classifications of witnesses appear. Some say that the use of 802.11 on a wide-scale basis across the community will lead to the collapse of the whole system because of interference. Then we have others say that it is not really an issue and is being overstated. I am keen to get, in the first instance, your views of how great the threat really is. Then I will pursue a couple of other avenues as well.

Mr Leonard—With planning there is no threat. The worst case scenario in the cocktail party effect is when you speak you have very little control over where your voice goes. Many of these 802.11b devices you can put directional antennae on and restrict the range of interference that your devices create. Of course, in a very high density situation there will be problems. Interference simply effectively means a shorter range of operation. I do not think there will be a problem if people are sensible in using this equipment and plan. That is if they say, 'I am going to set up an antennae here and not make it power emit everywhere but be mindful of other users and direct the energy to where it is meant to go.'

Mr CIOBO—There are some who state that the use of 802.11 technology should be limited to indoor use only, which effectively would curtail all your activities in that respect. I take it you would be against a prohibition of that sort?

Mr Leonard—I can see no reason for it. I would be against it.

Mr CIOBO—There has also been a proposal put to this committee that the ACA should adopt a role of being a coordinator of the use of the ISM band. So, effectively, there would be, for example, a database on a web page or something that people could go to—similar to what you have done here—and register their sites, with the ACA taking a coordinating role. It would be partially funded or fully funded by the people applying for a licence, a licence similar to a driver's licence, paying a nominal fee to operate either a directional or a nonlinear directional antenna in that part of the spectrum. What would be your thoughts on that type of proposal?

Mr Leonard—That mechanism would be very beneficial. Do not be fooled by my attire; I am a student who does not earn very much at all. Consequently, most of the equipment I have is very cheap to acquire and very old. The biggest attraction of 802.11b is that no licence is required to use it. When you talk about operational licences for outside use, I can see why such revenue might be required in order to support the scheme, but it would detract from its uptake.

It would make the medium less accessible but better managed. It is a trade off, I suppose, simply because of cost.

Mr CIOBO—In terms of the way that the communications act is structured at the moment, what do you see as being the principal problem—that it is biased against community groups or that it has not kept pace with development? Could I also seek your comments on what sort of reforms need to take place in order to make it more appropriately geared towards serving not only the big end of town but also the community networks.

Mr Leonard—I have not read the entire act but it did strike me that it was particularly weighted towards the big end of town, especially the number of penalty units for unlicensed carriage to the public—20,000. Was it a $2.2 million a day fine?

Mr CIOBO—Is that the maximum?

Mr Leonard—Yes, I think that is the maximum. I am not too sure, but it was certainly very large and enough to scare many people from getting into this. I think the legislation is almost too technology focused. It seems to miss the point of what communication really is. Today you can buy $100 worth of gear, set up and be a carrier for a small community. It is not really recognised that becoming a telecommunications carrier is getting easier today and more people are doing it. The legislation appears to treat such carriers as always commercial—not always commercial, but that seems to be the bias. I do not know what sort of changes I would suggest to it. It would be very helpful if there was clarification of what defines a commercial operation.

Mr CIOBO—From an ACA perspective, if there were some directives about whether you are in the tent or you are out of the tent, that would be helpful?

Mr Leonard—Yes. It would be helpful to have some nice litmus test that we could apply and know the limit of our activities and whether we can gateway commercial traffic for users. There are various ways around this. The 30-second delay trick to get rid of the dual ended communication classification is one. It is just a patchwork. It is not very appealing.

Mr CIOBO—You have obviously built up a significant number of participants in the Brismesh model. Does it operate similarly to—this is probably a poor analogy, I am not sure—a Napster type situation where effectively you are just using files and reading off each other's hard drives or do you actually have a gateway as well to the Internet that you are feeding information from or is that something that you propose to do? If you are, how do you monitor the flow rates of information? I assume someone does not have a broadband connection and that is the connection that everyone goes through. I am just wondering how the model operates in that regard.

Mr Leonard—The project is one of creating infrastructure, not services such as files. Whoever is attached to the infrastructure can provide whatever services they want. It is not specified and it is not the focus of the activity. The focus of the activity is to cooperate to form infrastructure on which people can run their own services. Whether that includes gatewaying to the Internet, file serving, running Napster clients or whatever is yet to be seen. I am sure it will happen. The vision comes about from the question: 'If you were at home and you had free,

high-speed broadband access to loads of other people around you, what would you do with it?' There are quite a lot of possibilities, especially when it is free. Does that answer your question?

Mr CIOBO—Yes, it does. In terms of usage patterns at the moment, you cannot say it looks like X per cent is used for gaming and—

Mr Leonard—It would be very difficult to tell at the moment. Because I am quite lazy I do not want to manage all these activities. The idea is that you simply allow these groups to coordinate activity amongst themselves. For example, you might have one person on top of a hill and he builds up friends around the place and then they can figure out the particular things they are going to do.

Ms GRIERSON—If it is self-managing, which it obviously is, what about self-regulation? Have you had problems with rogue users who are infringing peoples' copyright or privacy or who are putting out a signal that is interfering with everybody else? You are saying to us that it is growing so quickly and you have not got the power to regulate it in any way—I do not mean legally, I mean to pull people into line—have you had instances of that?

Mr Leonard—No, we have not yet but, sadly, abuse is inevitable with a large group of people, so I am trying to address this early on.

Ms GRIERSON—When you say 'commodity use', are you saying people are starting to use it to sell things or commercialise things in some way?

Mr Leonard—I used the word commodity as an adjective in 'commodity Internet', which is a distinction between today's commodity Internet, where you purchase access through broadband, cable or whatever, and the Internet that I grew up with in the early 1990s as a university student, where it was more social than it was research based. That is the distinction that I make with that word. It is an interesting question: what happens in the future when you have such infrastructure? Of course, the participants' activities will overlap with commercial activities and there will be economic activities going on. The question is: how does this meet the legal requirements of the day?

Ms GRIERSON—Do you see this community need as being long-term or do you think that, as accessibility becomes cheaper, people will move to a more reliable commercial service or do you think this sort of endeavour will always occur if there is free spectrum there to use?

Mr Leonard—I imagine that, under the current regulatory structure, the free spectrum will become a tragedy of the common situation. I am not sure what you are suggesting.

Ms GRIERSON—I am suggesting that there is a need now because to address this broadband and the sorts of speeds that young people want to access at is not easy and is very expensive, but, eventually, it may be more affordable. You live just outside the range and it will become available to you. When that happens, do you think that these sorts of community networks will disappear or do you think that these sorts of community networks for special purposes will always be necessary?

Mr Leonard—I think they will always be around, especially where commercial enterprises do not see any value in competing there. Obviously in Brisbane, Brismesh, if it gets properly off the ground and established, will compete with residential broadband commercial providers. This sort of community activity presumably will stimulate more commercial activity in the future which will win out.

I think a good analogy to draw is that of the road infrastructure. If you can imagine a world where people had simply beaten tracks between each other's houses and simply walked to each other's houses and then a commercial operator came along and said, 'I'm going to put down a big concrete road here, fenced off, so no-one else can use it and I'll charge people to transport stuff efficiently or fast' or something like that. That is the kind of analogy I would see.

Mr TICEHURST—Have you looked at the US experience? You were talking about the meshes growing throughout Australia. What is your experience with what has happened in the US?

Mr Leonard—The activities in the United States appear to be much more passionate because of concepts such as freedom of speech and 'the government is against us' and so on. So there is an appeal because of their subversive nature or perceived subversive nature. I am not sure what the effect is on the commercial activities, whether or not wireless ISPs are going to dominate over community groups in America, but certainly they are much more active over there and a lot more passionate about what they do.

Mr TICEHURST—What about problems of interference? You are talking about a huge growth rate. If the rate continues to grow like that surely you are going to have a lot of problems interference wise because you have got the other types of activities that can operate in that band as well. If you have got essentially an Internet type group, do you think you are going to have interference problems with other functions on that band?

Mr Leonard—Remember the focus of this project is to connect houses together, so these are residences with good directional antennae. The antennae will not be subject to interference as much as an omnidirectional or a whip antenna would be. In the future, if everyone in the house has ISM band using devices such as a mobile phone, cameras, printers, TVs or whatever which, all being noisy, talk to each other within the house, if there is interference it would simply limit the range but the infrastructure that I am talking about here would be just between the rooftops of the houses. People walking around on the streets and in cars driving around with ISM band using equipment would probably be unlikely to interfere with such a network.

Mr TICEHURST—Do you see any need to limit antenna gain. For instance, at the moment the power is restricted which has got a limit on range but also if you start putting in high gain antennae then you can also improve the range as well as directionality. Do you see any reason to license it in that sense?

Mr Leonard—No, because they are effectively the same thing. The four watt power limit in the act is a 36dBi gain antenna. That is the maximum gain antenna you can legally use. How it works is: a signal is sent out at a particular strength, four watts, 36dBi, and it travels a certain distance and loses energy, and then it is received at the other end. By making the receivers much more sensitive you can increase the length and the range. So the four watt power limit

essentially tries to curtail this tragedy of the commons situation by limiting people to their range of abuse but you can still get around this by listening harder, if that makes sense.

Mr TICEHURST—How do you propose to look at the actual information that is being transferred over these networks? How are you going to draw the line between what is commercial, as, say, provided by ISPs or other forms of communication, and what you are doing? How would you define what is commercial and what is non-commercial?

Mr Leonard—I do not know; I simply do not know how I would come up with a definition that would satisfy me. That is why you are policy makers, and I am sitting on this side of the table.

Mr TICEHURST—If you do not know, and then we come up with some regulation—

Mr CIOBO—He has to agree with it!

Mr TICEHURST—It puts the boot back on the other foot, doesn't it?

Mr Leonard—Yes. I have always considered commercial operations to be any exchange of a consideration. That definition is very blurry, because in our case an exchange of consideration would be the enjoyment you would get from participating in a community activity. So in a way that meets that definition. If you change the definition slightly to be an exchange of money then non-profit operation would be out of the question. If a guy is saying, 'I'm going to set up a good antenna at the top of the hill but I expect you guys down there to pay me a little money to help me set it up,' that might be viewed as commercial. I think making a distinction between commercial and non-commercial operation is problematic in itself. I would see this more as a social infrastructure where social activities include commercial activities.

Mr TICEHURST—In a way, it is a little like the amateur radio sphere where you have certain regulations, certain bands and whatever. Then citizen band radio came along. It became unwieldy after a while. I am not sure what the current situation is, but it was a bit of a fad for a number of years and then it disappeared. Do you see this as something like that? It might be a fad at the moment because it seems cheap and easy but, if commercial operations can provide low-cost, high-performance and more reliable systems, do you see this continuing into the future?

Mr Leonard—CB radio is still used today in areas where it makes sense to do so. I will not categorically say that activities like this will disappear. As data networking infrastructure, especially for residential access, improves and gets cheaper, I expect there will be less incentive to join in projects like this. But today it is very attractive and if the major telecommunications companies decide not to compete then it will remain attractive.

Mr TICEHURST—Fair enough.

CHAIR—What probably interests me most is that you have had some discussions with the ACA and you indicate they have not been particularly helpful.

Mr Leonard—They have been very responsive, but on some of the careful questions about whether or not we can carry Internet traffic across a public free-access network—essentially, an unlicensed carrier service—it has been very hard to get an answer out of them as to whether or not what we are doing is legal.

ACTING CHAIR—I can imagine why. I want to have a look at one particular area. The ACA has already given evidence to the committee, and they have pointed out that they are dealing with community groups and that they can see the problem in the legislation. They are trying to work it forward. In your submission, you say:

> Specifically, we wish to route "commodity" Internet traffic over our community network, either in a free or in a 'non-profit' sense, yet remained classified as "non-commercial" for the purposes of the Act.

Let me have a look at what that means. At the moment, you are looking at setting up a peer-to-peer network that will run at considerable speed so people will be able to share whatever they wish to share. You are looking at doing that on a non-commercial basis, which you are defining as not charging someone for it. So what are these people going to share—pictures of their barbecue or other content that they have put together, like stories they wrote in kindergarten or the current thesis work they are doing? It occurs to me that what is primarily shifted over bandwidth or spectrum is content, and the making of the content itself costs a great deal. What people actually have that they could share, entirely freely, mostly does not come from them.

Mr Leonard—The greatest consumers of bandwidth are multimedia services, such as videoconferencing that is personally produced. Entertainment in the form of music or videos is also quite bandwidth hungry. Whether or not you would consider people swapping DVD content and music a commercial activity is something I do not want to think about.

ACTING CHAIR—Probably the corporations that produce them do.

Mr Leonard—Yes.

ACTING CHAIR—I think that is where there is a key problem that you have in setting up an organisation as a dot.org. If it acts as a commercial entity then the probability is that it could be in conflict with the act. We have heard the other community groups talk about necessary changes that need to be made, but seemingly some of this may need in fact to be tested over time. Groups like yours would have to be very specific in terms of the steps that they took. I would guess, based on what you said previously in evidence, that one of the key difficulties you might have is that, having set up the intranet infrastructure, if the organisation does not take responsibility for what happens within that infrastructure, that may give rise to problems. We have seen that more broadly in terms of operation of ISPs and the Internet and so on. So probably over time it will become more complex.

Mr Leonard—Yes, certainly. As it grows, such issues become more and more apparent. Frankly, I do not know how to deal with it.

ACTING CHAIR—We will have to work on that together over time, I think, using this inquiry as we pursue other matters related to it. Mr Leonard, thank you very much for the evidence you have given today. The committee is appreciative of that.

Proceedings suspended from 10.32 a.m. to 10.44 a.m.

ASTBRINK, Ms Gunela, Policy Adviser, TEDICORE

ACTING CHAIR—Welcome, Ms Astbrink. Do you have any comments to make on the capacity in which you appear?

Ms Astbrink—I am pleased to be invited to speak to you today. I am the policy adviser with TEDICORE, which stands for Telecommunications and Disability Consumer Representation. It is a project that is funded by DCITA to represent consumers with disabilities.

ACTING CHAIR—Although the committee does not require you to give evidence under oath, I should advise you that the hearings are legal proceedings of the parliament and warrant the same respect as proceedings of the House. The giving of false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. Would you like to make some introductory remarks before we proceed to questions.

Ms Astbrink—People with disabilities have a dream: they want to access telecommunications seamlessly and easily, without worrying more than the average person about the equipment and how much it costs. They just want to use the equipment, regardless of whether they have a physical disability or are blind, deaf, hearing impaired or speech impaired. That is the important thing: to be able to use telecommunications services and products in a seamless way, just like anyone else in the community.

I will give you a little background about TEDICORE. TEDICORE has now been funded by DCITA for four years. It represents people with disabilities to achieve better telecommunications access. There are a number of activities that I am involved with as policy adviser. We have a project advisory body, which comprises people from the major disability organisations; for example, the Physical Disability Council of Australia, Blind Citizens Australia, the Australian Association of the Deaf, the Deafness Forum, Women With Disabilities Australia and the Communication Aid Users Society. We really try to represent the broad range of people with disabilities in Australia.

I have been involved with TEDICORE for the last 3½ years. I also have international connections: I am a member of COST 219, which is a European Commission project on disability and telecommunications. I am the secretary of the board of the Internet Society of Australia and I am also involved with the Cooperative Research Centre for Smart Internet Technology. I should say from the outset that I do not have a technological background. I work from the applications—the human—side of technology. With your permission, I can go through some of the main issues now.

ACTING CHAIR—Yes; absolutely.

Ms Astbrink—There is the need to incorporate consumer consultation in all avenues of telecommunications development. This is being done in a number of ways in Australia and it is very much supported by legislation. The Telecommunications Act is instrumental in making sure that some of this consultation happens, but there are a number of gaps. That is where it becomes important to ensure that consultation is improved and can cut across a range of areas. I

will not go into detail about the areas of consumer consultation; I will be very happy to answer questions about that as we go along.

Obviously, regulation is very important to ensure that accessibility is incorporated in new standards so that people with disabilities have access to networks and so forth. It is also very important that people with disabilities have access to the terminal equipment, so that they can actually use the network. As you will know, there is a disability equipment program. There are a lot of issues about people with disabilities being able to choose their carrier and—if they choose a carrier other than, for example, Telstra or, to some limited degree, Optus—obtain their equipment. I believe that this will be a continuing issue if it is not addressed in the near future. This will become important as we move to wireless broadband, where we are looking at a range of other terminal equipment.

Any to any connectivity—I am sure you have heard that. It is a mantra, I suppose, for the disability movement. It is so important that we are able to use whatever service and whatever equipment we can and it is seamless. Universal design is again probably something that the committee has heard about. It is very important that equipment and services are designed to accommodate as broad a percentage of the population as possible. There will always be people in the community who may for one reason or another not be able to use general equipment, but then there needs to be connectivity, there needs to be that type of cabling and connectors to make a specialised piece of equipment able to be easily connected to the generic equipment. I have some material here regarding that which the committee members may be interested in.

I know you have heard about V.18 and the importance of V.18 when it comes to text telephony and related connectivity for deaf and hearing-impaired people and the need to introduce that into Australia. Also, with access guidelines, something that had a huge impact in the United States is the introduction of section 508 of the Rehabilitation Act. That actually states that federal government employees with disabilities in the US should have the same access to IT and telecommunications equipment as their able-bodied colleagues. To ensure that, the federal government states that they in their public procurement policy will favour accessibility, and in most cases the vendors that supply IT and T equipment to the US government need to make sure that equipment is accessible, otherwise they might lose the tender.

That has had an impact in that a lot of software developers are now incorporating accessibility in their new releases. That is having an impact on various equipment as well. The government has developed a set of accessibility guidelines to help vendors ensure that they comply with these particular regulations. Obviously from the US that has a worldwide impact. In Japan they are developing similar guidelines. Ireland and Sweden are also doing that. So it seems that in Australia we have an opportunity to develop guidelines for accessible equipment and services to be used as a basis for public procurement. That is a wonderful carrot and a way for developers of services and products to make sure accessibility is built in right from the start. I am sure that you are aware that building in accessibility at a later stage is much more expensive and much more difficult. If it is done right from the start, it is quite easy in a lot of cases.

Because my expertise also relates to overseas developments, I have just mentioned a couple of these. One of them in my submission related to the Swedish government allocating the

equivalent of A$4 million to investigate broadband developments for people with disabilities in Sweden. Not all of those are wireless related. They cover a wide range of areas for many different types of people with disabilities: people who are deaf and hearing impaired and also people who have intellectual disabilities that are often forgotten. It means that people with intellectual disabilities who might find difficult the abstract idea of talking to someone on the phone without having a picture to relate to, because there is only a disembodied voice there, can, if they see a picture of that person, better understand what is happening. There have been a number of trials in Sweden with this. Now moving into broadband, it means that not only could they have a conversation over the phone with a family member, but they may also receive information and news if they are interested in a sport or whatever in a way that would be understandable for them. That is quite a breakthrough and a very interesting development. A number of wireless broadband trials will be done. The government wants to ensure that they are using equipment and networks that are currently available, so that will come a little bit later in the project. The other projects will be starting probably in the next three or four months. It will be very interesting to monitor the developments there. COST 219 is working on the third stage of their project. That will specifically look at broadband applications in a variety of ways.

Finally, I know that you have heard about WISDOM from previous submissions. A Swedish colleague of mine has done a lot of work regarding trials and prototypes of how it actually would work when a deaf signing person uses a handset, a small laptop with a camera and a wireless LAN card. Depending on how it is used, they can communicate in a variety of ways either to another person who is deaf and using sign language or a video relay service. I have a small CD presentation of about seven minutes, which unfortunately is in Swedish and in Swedish sign language. There is no audio. I could show that for you if you would like me to.

ACTING CHAIR—Sure. Just prior to doing that, you have got some extra materials that you are willing to give the committee. Would you like to give those to us as exhibits?

Ms Astbrink—I would be very happy to. Can I explain what they are?

ACTING CHAIR—Certainly.

Ms Astbrink—This particular book, *Bridging the Gap?*, is the latest book by COST 219. It was written last year. It outlines 15 years of work by COST 219. One of the findings relates to relay services. Another area is standards and legislation. There is a section also about emerging technologies, which could be quite interesting. I should say that the situation in Europe is quite different in some ways, in that the European Commission funds a lot of pilot projects and there has been a lot of very useful work done in testing various applications of new technologies. Many European countries at this stage do not have legislation as we do in Australia. It means that in some cases consumers might not be able to participate as much in developments and services as they would like. That is reflected in some parts of that book. I just wanted you to note that as well.

I have two publications which are also from COST 219. *Which button? Designing user interfaces for people with visual impairments* relates to designing user interfaces for people with visual impairments. It covers a range of equipment, including telecommunications equipment. Interfaces are very important for access, so I have included that booklet. The other one relative to that is *Telephones—what features do disabled people need?* That provides some

very useful statistics at the beginning about the number of people in Europe with a variety of different disabilities. Those figures should be extrapolated with care—and I should emphasise 'with care'—to the Australian situation, because figures are collected in a lot of different ways. Also people may have multiple disabilities which could mean that the figures are a bit skewed in a variety of ways. I just issue that as a warning. This particular booklet notes the type of disability and the particular features that are important to consider in a piece of equipment relative to that disability. The final section relates to each of those features and relates back to the disability, explains a bit about the feature and gives a very rough estimation as to whether it has a low, medium or high cost to implement.

The booklet *A step forward—design for all* talks about universal design. An institute in the United States has developed seven principles of universal design to ensure that people with disabilities have more access to equipment and that equipment generally is made more available to the whole population—to people who are older who may not want to use complicated equipment, to people who have, say, big figures and are trying to manipulate a small mobile handset and the keys. The seven particular features in this booklet include, for example, equitable use, flexibility in use, simple and intuitive use. I will not go into more detail, but I have included that booklet as well. I was wondering whether my copy of *Telecommunications—guidelines for accessibility* could be photocopied because it is my only copy.

ACTING CHAIR—We should be able to organise that.

Ms Astbrink—Thank you. *Telecommunications—guidelines for accessibility* looks at a variety of terminal equipment—for example, telephones and mobile phones. Something which has not been discussed is that people who are blind use mobile phones a lot to get around in the community. They are not able to use the address book in the mobile phone. They cannot use any of the menus because there is no speech output. That means that they are locked away a lot from the particular services of a mobile phone. It is a matter of incorporating that type of feature as well as an easy-to-grip body for people who have a weak grip or poor dexterity. Volume control is obviously important for people who have some hearing loss. For people with low vision, having a screen that has good contrast and reduces reflective glare is important. So there are a range of issues with mobile phones. Also mentioned in this booklet are public phones, video telephony, interactive TV and so forth. The final booklet *Call barred? Inclusive design of wireless systems* relates to inclusive design in wireless systems. It is written very much from a European perspective, but I believe there are quite a lot of useful areas that are relevant to what is happening here in Australia. I will also leave that booklet with the committee as an exhibit.

ACTING CHAIR—Thank you. We are ready for the CD-ROM presentation.

A CD-ROM presentation was then shown—

Ms Astbrink—This is the WISDOM project in practice. This is the first example. This is a relay service between two different places. I am sorry about the delay in the presentation.

ACTING CHAIR—It is one of the problems with universal access that we have all got.

Ms Astbrink—I apologise for the delay. The presentation was set up and then it went into sleep mode and I am trying to set it up again. Are there any questions that members would like to ask?

Ms GRIERSON—I just want to make a point. In listening to your presentation, Ms Astbrink, and that of Australian Communication Exchange, I think it was remiss of me not to mention a submission we had previously from m.Net, which is based in Adelaide and has received $9.3 million, I think, worth of funding for Networking the Nation. I note in your submission the point you make about the R&D stage being the time to consider the needs of disability groups in Australia. I am not aware if m.Net are giving that attention. They are dividing their research into content based areas like education or transport or whatever. I am suggesting that it is something that the committee can pursue again with some further questions, but it is also something that your group might be interested in pursuing as well; that is, whether m.Net are building that into the R&D stage. As I said, they are receiving Commonwealth funding, so now is the time to make sure they do.

Ms Astbrink—Thank you very much for that observation. I think R&D in this area is so important. There are really two parts to research and development—research that relates to disability and general research that also incorporates accessibility and the needs of people with disabilities. That needs to be taken into account, just as, say, education or health factors are taken into account.

Ms GRIERSON—And they cover all those areas. I also wanted to ask you about the European project, the WISDOM project, and the Swedish government project. Are there any limits to the application of their findings to our situation in Australia?

Ms Astbrink—Any limits to it?

Ms GRIERSON—Yes. Would their findings be based on the same sorts of needs and the same sorts of technology applications that we have?

Ms Astbrink—I think the technology applications would be similar. We are looking at wireless local loop, wireless fixed access, the third generation and so forth. The unique situation in Australia is, of course, our rural and remote areas. Sweden has probably the least population density of all European countries. There is no way that you can compare that to the Australian situation. While you can have wireless fixed access in a lot of cases in Sweden, I do not know how that can transfer to Australia. That is the sort of research that needs to happen here.

One of our concerns, and it is probably something that other submissions have mentioned, relates to Telstra now putting in wireless local loop in some rural and remote areas. They are aware that there could be deaf and hearing-impaired people using TTYs in those areas. Currently, TTYs are not accessible or compatible with the wireless local loop system. That means that in future people who are deaf cannot move into those areas and that as people grow older they will not have access. It is a very short-term solution. We need to find solutions that work here. I believe that ACE discussed some aspects of this. Having research and development in that area, to support that need in Australia, would be very valuable.

This committee has developed a huge amount of expertise from reading, listening and interacting with people from all sectors of the community over the past months. It could be useful to have some continuation. From my point of view, as I am interested in people with disabilities, a reference group could be set up. Some of the people who have sent submissions from various organisations could be part of a reference group to look at particular accessibility issues so that the work continues. It is complex and highly technical, and a lot of funding is required to produce successful systems that the whole community can make use of in the best cost-effective way.

Resolved (on motion by **Mr Ticehurst**):

That the committee receive as evidence and include in its records as exhibits for the inquiry into wireless broadband technologies the documents received from Ms Gunela Astbrink entitled: *Bridging the Gap? Access to telecommunications for all people; Which button? Designing user interfaces for people with visual impairments; Telephones—what features do disabled people need?; A step forward—design for all; Telecommunications—guidelines for accessibility, a*nd *Call barred? Inclusive design of wireless systems.*

Ms Astbrink—The presentation is now ready to start again. This screen shows a relay between two different places. This young man has a Sony Vaio laptop with an inbuilt camera. He is signing into the system. It is being picked up by the relay officer who has been asked by the young man to ring a particular number to connect with someone else. She is saying, 'It is ringing now. It is connecting.' Now they can start the conversation. Here is a young woman with a mobile phone who has just been connected to the call. She is talking with her relay officer. The relay officer is then signing what she is saying back to the young man who has the Sony Vaio. They basically continue the conversation in that respect, and she is sitting in a totally separate location from the young man. They are finishing the conversation and hanging up the phone—saying goodbye.

Mr HATTON—That is universal.

Ms Astbrink—That is right. The next example is a mobile call between two deaf users. This young man comes to this building, and in Sweden most people have a code to unlock the door. He has the wrong code, he cannot get in, and he thinks, 'What am I going to do? Well, I will ring my friend and get the code.' So he takes his laptop out of his pocket, and it is all wireless so he can connect up to his deaf friend and he can sign and ask for the code.

Mr TICEHURST—Who needs TTY?

Ms Astbrink—That is a fixed set-up, and he is signing. There are a lot of people who need TTY still. As you know, TTY is an old piece of equipment. One day the sort of equipment we have could be accessible for a deaf person using standard software and hardware.

The third example is quite interesting. It is sign recognition; it is quite different. On the screen in front of that man are interactive services. One is the economy; two is news and sport. He is actually signing to the machine, it is picking up via the camera and it is responding to his request. This is an interactive information service. He wants some information about sports, so these are the latest matches—yesterday—and how many goals there were. And in the inset of the picture he would see someone signing. So he is then getting the information through signing. This is very much at an early stage, but it is being tried.

Example four is remote interpreting at a meeting. There are two people coming to the meeting—our young man, again, with his little laptop and a young woman who does not sign and is a hearing person. He connects up to the video interpreting service and the interpreter will then speak to the young hearing woman—as you can see, the interpreter has got a headset. Now the young woman has spoken and the interpreter is signing back to the young man. The inset changes according to which is the dominant part of the discussion.

That is basically the end of that conversation. They were four examples of what the WISDOM project is working on. This was done last year. It is just being tested. This shows some ideas about future UMTS terminals in WISDOM. They are products that are available from various large manufacturers that could possibly be used in conjunction with this type of project if the capacity is there and the considerations of people with disabilities are taken into account. The screen states: You can influence the future by making recommendations. That is the end of the demonstration.

ACTING CHAIR—We are running over time. Do members of the committee have any further questions?

Mr TICEHURST—I make the comment that you have made a very important contribution and have certainly highlighted a need in the community. How many people with disabilities in the Australian population would need these types of communications?

Ms Astbrink—Statistics are very difficult. The Australian Bureau of Statistics in their 1998 survey said that over 19 per cent of the Australian population have a disability. We know we have an ageing population in Australia, with more vision loss, hearing loss, arthritis, mobility impairment and so forth. We could be talking about 25 per cent of the population who have some functional impairment which would mean that they would be impacted upon if telecommunications services were not designed to be accessible in one way or another. This is specifically for people who are deaf and who are signing; it is designed for that particular community. If we are talking about the whole picture, that is an approximation. It is very hard to get good statistics but that is what we believe.

Mr TICEHURST—How many of these TTYs do you reckon are in use?

Ms Astbrink—That is also a hard question to answer because there are various levels of provision of TTYs. The current disability equipment program is administered by Telstra. At the moment Telstra and ACA have statistics for all of those TTYs, but before then there was a voucher system. Not everyone was eligible for that, so people had to buy their own TTYs. There are people who have very old TTYs. In other words, it is very hard to get a very good picture.

Mr TICEHURST—If you are going to spend money looking at making the thing compatible, you need to know how big the problem is. Are you able to do some research and find out what we are talking about?

Ms Astbrink—Yes. I know the Australian Association of the Deaf and maybe ACE have some statistics on that. They would still have the statistics in relation to those particular problem areas which are not really accounted for. Again, the TTYs are old equipment and it is a matter

of finding ways to ensure in the future that different terminals are able to connect back to the old TTYs, because there would be a number of people who would want to keep them for a number of years, but in the future they need to be able to move to new terminal equipment.

ACTING CHAIR—Telstra recommended the closing down of the AMPS network and a move to a full GSM network. Europe is doing a lot at the moment to try to redress the problems, but given the difficulties that the GSM network has provided for people with hearing impairment in Australia, what is the situation in Europe? If you are using GSM mobile phones there, I imagine they have the same problem that we have found here.

Ms Astbrink—Yes, it is a difficulty and I think they have exactly the same problems. I do not specifically know of any country that had the type of solution we had here where Telstra and other carriers had a complaint against them, so they were obliged to provide a short-term solution of moving people to CDMA or the provision of a neck loop. There is an information campaign and so forth but it is still a short-term solution. Hearing aid manufacturers are gradually moving into the provision of other types of hearing aids which are more protected, I believe, against GSM interference. It is a problem in Europe as well.

ACTING CHAIR—But Europe does not have an alternative to GSM at the moment, do they?

Ms Astbrink—No.

ACTING CHAIR—Going forward, have they learnt any lessons? The problem that hearing impaired people have with the newer versions of GSM—do you know if that is being addressed?

Ms Astbrink—You are asking about third generation GSM, CDMA. I am not aware of what the situation is there. I would hope and expect that because the interference issue with hearing aids and a lot of other equipment is so well known it would have been addressed. It is an issue where maybe in Australia we could ensure that we have input into ETSI, the European standards body's work and maybe ITU-T, and ask those particular pertinent questions. That is one role we could have. We here cannot set the standards but we can influence what happens in those bodies.

I know, for example, that in the ACA there is a new committee called AUSTAG, which encourages use involvement in standard settings on an international basis. ACA is providing recommendations to the global standards collaboration and ITU-T to ensure that their policy is to include consumer involvement in the standard setting process. That process is starting from Australia and I think what you are suggesting is very worthwhile and should also be incorporated in some recommendations from AUSTAG.

ACTING CHAIR—Where we can directly affect it is in our local situation. Did Telstra talk to your group or to other groups at all, to your knowledge, prior to putting in the wireless local loop?

Ms Astbrink—It depends. Trials were done on King Island and I think it was there that these particular issues became known. Organisations like ACE and others that TEDICORE represents

started talking with Telstra and saying, 'We are concerned about this.' It is an issue that has been raised at the Telstra Disability Forum. So Telstra's solution was to look at who lives in those communities and survey communities case by case, and produce alternative technologies for TTY users without actually looking at the possible technological solutions in the longer run. So, yes, we did talk to them, but we did not get the solution we would have liked.

ACTING CHAIR—We will have a talk to them tomorrow and see how we go.

Ms Astbrink—Thank you.

ACTING CHAIR—We had evidence in Sydney about the costs to the users of TTY. It is something you do not naturally think of, but it was apparent that the cost of that is very high. The evidence was that the cost to the hearing-impaired user would be dramatically decreased using a lot of the new technologies. Would that be your view as well?

Ms Astbrink—When it comes to TTY, it is obvious that it takes so much longer because you have two people typing messages and you might have a relay operator in between, and there is a whole range of issues about the length of time that takes. Signing communication is quite different. You would have seen over the course of the hearings, for example, Phil Harper with his interpreter and the speed of that interaction. If that is done through a terminal, that speed should be similar to face-to-face signing interaction.

ACTING CHAIR—Ms Astbrink, thank you very much for your evidence today and the wealth of extra materials you have provided us with. We appreciate it very much.

[11.38 a.m.]

PERRY, Mr Grayson, Manager, Economic Development, Gold Coast City Council

VOUGHT, Mrs Karen, Manager, Value Management Branch, City Governance Directorate, Gold Coast City Council

ACTING CHAIR—Welcome. Thank you for your patience. Is there anything you would like to add about the capacity in which you appear today?

Mrs Vought—I guess we are both trying to have a go at representing the interests of our region as well as our organisation, the Gold Coast City Council.

ACTING CHAIR—Although the committee does not require you to give evidence under oath, I should advise you that the hearings are legal proceedings of the parliament and warrant the same respect as proceedings of the House. The giving of false or misleading evidence is a serious matter and may be regarded as contempt of parliament. Do you wish to make some introductory remarks before we proceed to questions?

Mr Perry—We appreciate the opportunity to speak before the committee this morning. A short background to our city might be useful to explaining why broadband solutions and choices are so important for the Gold Coast. It is a city with a population in excess of 430,000 people, the sixth largest city in Australia and the fastest growing city in Australia for the past four decades, and we hope it will continue to be so. Gold Coast City emerged out of an amalgamation approximately seven years ago between the City of Gold Coast and Albert Shire to form the second largest local authority in Australia behind Brisbane City, which is No. 1. So you have within a 100-kilometre radius the two largest local authorities in Australia, with SEQ as a significant regional economic force.

It is a regional city with many of the characteristics of a capital city. It has significant population inflows which are expected to recur in the future. With that population inflow comes an associated expectation of a technology hungry population. The council in itself is a significant player in the city. It has a budget of approximately $500 million a year. It is one of the largest employers in the city. Part of that $500 million budget is a significant commitment to the economic development program. Part of that economic development program is the Pacific Innovation Corridor program, which is a corridor development program based around 10 industry clusters. Part of that Pacific Innovation Corridor program is the need for low-cost, high speed telecommunications infrastructure.

Improving the economic performance of the region, we believe, is critical in its ability to move to a diversified economic base away from the traditional base of tourism. So the charter for our economic development area is broadening and strengthening the economic base of the city. Having the ability to provide business and industry with cost-effective broadband solutions is an important component in attracting knowledge workers and knowledge industries and continuing to allow the city to develop from a business and industry perspective.

Mrs Vought—As you can see, Grayson's focus is predominantly on the economic development of the region. The council itself is a huge consumer of ITC related services as well as a deliverer of services. One of the things that we are really interested in is how we can partner with other people and use our own purchasing power to influence better outcomes for both ourselves and the community. As you can see from our submission, the particular issues that we have are not unique to the council. Our real issues go to last mile problems. We have huge pieces of infrastructure, mostly terrestrial based, which are not being exploited to their fullest potential because of the last mile issues. We see this as an opportunity for possibly working through some outcomes where wireless type broadband technologies can be used to supplement the existing infrastructure that is in place.

There is one thing that is a bit unique to the Gold Coast. I previously worked for a long time in the Northern Territory, where the tyranny of distance was a particular problem. I was quite amazed when I moved to the Gold Coast to find that, on the south-east coast of Australia and within our city boundaries we do have a real mixture of regional, urban and remote issues that we are dealing with in terms of telecommunications. I was quite surprised about that. One of the things I can leave you with today is a one-page snapshot of our own provision of internal council infrastructure. We have actually had to build and operate our own microwave network just to provide our own services in council because there is inadequate infrastructure in particular areas, where we have depots and offices.

ACTING CHAIR—Would you like to provide that snapshot as an exhibit?

Mrs Vought—Yes.

ACTING CHAIR—Thank you. I might just start on the last part—the Gold Coast and the Gold Coast council. People would primarily think of just the strip along the coast where they spend their holidays and so on. But you have indicated that you have a much broader problem facing you—you have rural and remote as well. Can you tell us the extent of the council's operations—just the physical?

Mr Perry—In terms of our geography?

ACTING CHAIR—Yes.

Mr Perry—We stretch from Beenleigh in the north to Coolangatta in the south—I think it is approximately 1,430 square kilometres—and we go back to the mountain, which is Mount Tamborine.

ACTING CHAIR—What sort of particular problems does that provide? I imagine in the area that is very close to the coast there is fibre-optic provision running down there that could be readily adapted to.

Mrs Vought—Yes, it is reasonably well serviced in those urban areas. But we have quite densely populated areas out in the more rural parts for example, the Currumbin Valley. Even some of the closer areas do not have, for instance, access to mobile phone services and there is no broadband access, and these are areas that are quite close in. The issue is that we have a huge piece of infrastructure that Grayson outlined in terms of the Pacific Innovation Corridor

between Brisbane and the Gold Coast but there is nothing servicing the end of that out to the areas where the demand for services is actually building.

Mr CIOBO—Can I take the opportunity to put on the record that Gold Coast City Council is the first council to appear before us as part of the inquiry, and I am delighted to have them here today. There are a couple of aspects that I was keen to inquire into. The first is the microwave uses that Gold Coast City Council has adopted. What sort of transmissions are they? What technology are you using—is it licensed spectrum or the ISM band?

Mrs Vought—I am not going to be able to answer the detailed questions, sorry, because I am not a really technical person. If you want to know, I can get you more details and I can send them on to you.

Mr CIOBO—It would be good if you could take that on notice so that we know, and also what services you are providing over that part of the network.

Mrs Vought—Just to put that into perspective: the microwave network that we have has been built up over time, but Gold Coast City Council put voice and data services out to tender late last year. That tender was finalised in August so it is in a time frame that is particularly relevant. The tender was to see whether this approach, in terms of continuing to augment that microwave network, was appropriate or whether there were other, more flexible options. It was particularly with a view to encouraging responses from telecommunications providers in the area. It was really interesting; I was amazed at the outcome. We ended up with three original bidders: Optus, AAPT and Telstra. Optus withdrew because they believed that they did not have the infrastructure in the region, and it was going to be too costly to on-sell Telstra services. AAPT only bid for the voice part and not the data part.

So we ended up with one player, which is really the current situation. We have Telstra services in particular areas, and they are inadequate. It just cemented this current arrangement where we have to supplement that with our own solutions, if you like. It was quite disappointing—and that was only in the last seven or eight months.

Mr Perry—And that is despite having many other telecommunications players in the city such as Powertel, Unicom, Soul Pattinson Telecommunications.

Mrs Vought—That is right; but they did not respond. Part of the problem, I think, is because their existing business models require them to have a certain amount of guaranteed supply and demand before they are willing to take the risk. This is part of our problem in sorting out what our response should be as a council, because we are highly conscious of the fact that the infrastructure of itself, the supply of itself or the demand of itself does not produce the right outcome. It is actually the amalgamation of some infrastructure and supply and demand. Even with infrastructure, if there are no services and no demand, you still do not get the right outcome. So we are grappling with this exact issue ourselves in terms of what our role could be as a council and in the region to try and stimulate those three things concurrently.

Mr CIOBO—You also made the comment in your submission that local councils are well placed to make good public policy decisions, given their connection with grassroots—that is one way of phrasing it. In terms of modification to the regulatory regime that applies for

wireless broadband, what sort of ideas do you have as to the framework that we could use that would incorporate that local knowledge that councils have?

Mrs Vought—We are responsible for planning issues and things to do with infrastructure and above-ground infrastructure such as towers. We have already started discussing what sorts of impediments might need to be removed to facilitate things happening in a better way—by less regulation, possibly—and, through our own policy-setting, how we could influence those things in a positive way rather than being 'stoppers' to it. Mr Perry's people, particularly, have been working with our planning people, because we control a lot of public land. There is a great potential for the council, via its own regulatory regime and its own policy making, to facilitate the better use of those things and to partner with telcos and others in the region as well.

Mr CIOBO—In your submission you also state:

> … recent spectrum dependent technologies may deliver greater benefit within currently allocated spectrum and therefore, it is valid to not limit consideration of potential spectrum opportunities purely to unallocated spectrum.

What technologies are they, and what do you propose with regard to that statement?

Mr Perry—Are you looking at the choices that we could perhaps bring to the region in terms of wireless choices?

Mr CIOBO—That is right.

Mr Perry—In recent times we have had a number of firms through our council's doors offering their wireless services, perhaps as a solution to some of the issues that we have raised in the region in the past. There are an emerging number of firms who think they have solutions to attach to the existing traditional in-the-ground infrastructure. I refer as an example to Varsity Lakes, which is located near Robina, where there is a lot of in-the-ground infrastructure but a lot of the firms located there cannot access that because of cost. Some of the solutions include line of sight wireless, putting them atop towers and then providing them into the residential and commercial areas within Varsity Lakes. It is about using those line of sight services for increasing data carriage. Is that the type of response that you are seeking? If I could take that on notice I could give you a technical answer.

Mr CIOBO—Specifically what we are interested in is that if you already have allocated spectrum and they are saying, 'It is not just unallocated spectrum that we are interested in but rather we need to focus on spectrum as well that is allocated,' would that be supplemental to the allocation of the spectrum already or would there be a case for saying, 'We'll take that part of the spectrum and assign that to something else and then reassign what was there originally'? That is the area of interest as well.

Mrs Vought—I do not know what the answer is but there are various ways either through regulation or through using the influence of governments, as well as providing incentive arrangements. We are really keen to have whatever capacity and capabilities that wireless broadband might offer, targeted at the areas where we actually have a problem, which is not in the areas where there is already sufficient infrastructure. So it is whatever we can do to influence that outcome because we want those solutions to be targeted at the problems. The way

the business models are, or appear to be at the moment, is that the service providers that either buy up those spectrum licences, or invest in whatever it is, are going to naturally want to target their products or solutions where the most lucrative markets are, but that is not where the problem areas are. Generically, the feeling is that whatever we can do collectively, even ourselves, to influence that happening then that is what we would like to do.

Mr CIOBO—We looked at a report that the Canadian government recently developed with regard to wireless broadband technology and there was a commitment given to introduce wireless broadband across libraries and schools and those types of places. Would you foresee that council would have—and councils broadly across the country—an interest in perhaps playing a role in the roll-out of different types of wireless technologies for deployment into, for example, libraries and those types of things that are the domain of local councils with a view to fostering the exact types of technologies and outcomes that you have been speaking about?

Mrs Vought—Yes, but probably more in areas where there is a need. At the moment, in some areas we have got sufficient infrastructure to the door, so it is probably in other areas where we are looking. For example, we want to deploy library services to our residents who live outside, say, the Robinas, and another example is with our own work force, which is highly mobile. So we would be looking at opportunities like that, but it would be in areas where we have got needs as opposed to where we are actually well-serviced at present, rather than saying across the board.

Mr CIOBO—But there would be interest?

Mrs Vought—Definitely and that is why I keep reiterating that it is our desire to deliver more services electronically and to do our bit to stimulate the supply side. As well, we have a commitment as a council to developing the region. So it is on all those fronts that we are committed to doing things, even with our own resources. I keep harping on about this: we should be able to do more with our purchasing power as a major consumer in the region to deliver a better outcome for the region.

Mr Perry—It is not necessarily just the Gold Coast City Council, it is those surrounding local authorities that we can partner with and collaborate with to deliver those services as well. So it is not just looking at this in isolation necessarily.

Mr TICEHURST—You were saying you have microwave links around your area; have you considered value adding onto those links in the way that, say, NorthPower did in New South Wales where they used those links and actually set up an Internet service called turboWeb? Essentially, they used their own infrastructure. If you look at remote areas—I understand what your area is like; it is not too different from the Wyong council area in which I live. They have got a concentrated population on the coast and out in the valley areas there are not a lot there. It is not economical for somebody to set up the same sort of cellular services out there, but if you have got depots in those areas where you run your links out, maybe you can value add onto those to provide local services with the council. If you have got electricity there, a lot of the electrical utilities are now looking at combining IT with electrical, and in a lot of cases where gas is available they have all three services together. So maybe that is a way in which you can be proactive.

Mrs Vought—I guess it depends on council making a decision about what its core business is. Certainly, the other side of that is whether the region would be better off with the private sector providing that service and therefore generating some growth in that area. The problem with our existing microwave network is that it is struggling, and that is the reason why we went out to tender. We are struggling to support our own needs in servicing those areas. We would have to make huge investments in that infrastructure to expand our current capacity to take on any more. In fact, we have got issues with deploying the applications we want to deploy for our own services in some of those areas. I hear what you are saying, and that is a model that other councils have adopted. Our council certainly has not taken that philosophical position and I am not sure that is the one it would want to take—doing it themselves as opposed to generating that sort of development by the private sector in the region.

Mr TICEHURST—It is a matter of whether there is a commercial benefactor.

Mrs Vought—That is right. If you are going to make that investment, what is your outcome? Do you want to kick the tin and generate an outcome that might benefit the region or the community or do you want to get into it yourself? Is that the best use of ratepayers' money?

Mr CIOBO—I want to clarify one matter. When you say you have issues, do you mean bandwidth issues or the actual rollout of the infrastructure?

Mrs Vought—It is the band width; it is the capacity. We have got some applications that, given our existing network, we cannot deploy to, say, our Southport depot or our Coombabah depot because of bandwidth issues.

Ms GRIERSON—Just for my information, because I am not a Queenslander, does your council cover those 400,000 people or are they covered by the other authorities?

Mrs Vought—Yes, that is us.

Ms GRIERSON—So you have control over that market size.

Mr Perry—In excess of 430,000 people.

Ms GRIERSON—Yet you have not had any private sector investment in putting in a network.

Mrs Vought—We have got lots of private sector investment in bits of it, but the last mile issues are the big ones, mainly because of the huge investment, the risk and the issue with supply and demand.

Ms GRIERSON—Are there any planning constraints? Do you have an SEP or an LEP that allows those sorts of infrastructure build-ons, add-ons or access?

Mr Perry—There is a new planning scheme which is about to come out, we hope. We have also provided a lot of input into the south-east Queensland telecommunications strategy/policy. In terms of our own planning scheme, we now have a telecommunications component within

that planning scheme, so we hope that it will provide a very flexible environment for telcos to operate in. There might be some issues in regard to some aspects of that telecommunications component of the planning scheme; we have taken comments from companies who responded to the planning scheme when it was under review and we are currently assessing those. It could be that council undertakes a policy environment whereby we ask developers to lay conduit as part of their development application process, so that for future uptake requirements they already have the conduits sitting there. That could be a part of our planning scheme as part of the development application process.

Ms GRIERSON—I think this is a common problem. I am from a region that has three companies at the moment all vying to provide a network. It has a regional city of a similar size. I am wondering why that interest is not here and what you think the role of government is to assist that interest.

Mrs Vought—Like I said before, we were really surprised at the lack of responses to the tender. I can only assume, like I said, that the bottom line results are not there and they did not see that the risks were worth taking. We did go out to the market and were hoping for some really innovative responses in terms of partnering with us as well.

Ms GRIERSON—Have you done any research on the take-up of services in your area?

Mrs Vought—Yes.

Mr Perry—In all the discussions we have had with telecommunications firms that come through council's doors—and we actually have a telecommunications group that meets irregularly which comprises all the telco players in the city—their answer is time and time again, 'When we see the demand, we will start rolling out the services,' which is not unique to the Gold Coast. I suppose it is about trying to develop that environment where the telcos are comfortable to actually take the first bite and provide the service and see what the take-up is.

Mrs Vought—We recently, as part of our own customer service strategy, went out and did some market analysis with the community. One of the areas that we focused on was the capacity of the community, both business and residential, to participate in an electronic environment. The capacity to do so was a lot higher than I thought. The community were asked, 'Would you use electronic services? What do you see as important?' I was amazed with the answers. There was a high capacity in certain areas in terms of the hardware at the other end, not necessarily the bit to connect in the middle. I guess we are a bit unique in terms of the number of non-residential ratepayers that we have. So I guess it is the mix of the population.

Mr Perry—One comment that we would make about the delivery of broadband services is that it is really about educating the end user in many respects.

Ms GRIERSON—That is an interesting point that is coming through.

Mrs Vought—Exactly, and that was shown in the survey that we just did. We obviously have a key role to play in that.

Mr Perry—We are hoping that the telecommunications firms that actually have staff in the region are not so technically focussed when they are trying to deliver that service to a customer and that they actually talk in a customer's language.

Ms GRIERSON—Perhaps some of the education in those sorts of sectors could focus on that and perhaps their high usage rates could be used to complement increasing the usage rate or take-up rate in the wider community.

Mrs Vought—Education about supply and demand and stimulating it is something that we are grappling with in terms of what we can do and what role we can play to stimulate both the supply side and the demand side.

Ms GRIERSON—Yes, to convince the commercial operators that it is worth it.

ACTING CHAIR—Even though you lost out on it, if you declared yourself a multifunction polis, they might come screaming to your door.

Mr Perry—We have seen Adelaide's results.

ACTING CHAIR—The council has a lot of responsibility in the area of mobile phone towers. You have seen the strength of the campaigns that have been waged with regard to that. Are there any indications—and because of those campaigns there is probably less provision for mobile phones than there otherwise might be—of public concern of a similar dimension with regard to wireless broadband?

Mrs Vought—There have been community issues but, interestingly enough, particularly through Grayson's area, we have also had a lot of interaction with telcos and others about the other side of that argument. Apart from doing what we can in terms of our planning schemes and influencing those and our policy positions, we are trying to get people to cooperate with co-sharing of infrastructure and things like that. That is a particular issue that people associate with one of the problems with the wireless type infrastructure rather than the terrestrial based. It is certainly an issue and it is a real issue for planning as well.

Mr Perry—In fact, from planning's perspective, they are currently investigating the option of perhaps a sunset clause on towers, so that there is a review period after a certain time to assess whether the technology is still current and whether there is a still a need for those towers in those locations. That may become part of the planning scheme.

Mrs Vought—That is part of the issue about balancing up those community concerns with reality. It is not unique to telecommunications; there is always that constant balancing act between doing one as opposed to satisfying community expectations as well.

ACTING CHAIR—Thank you very much. As Mr Ciobo pointed out, you are the first council that has given us evidence. We appreciate it very much, particularly because of the practical nature of what you had to bring to us. You are not the only local government body that will have those problems—they would spread right around Australia—and it is a useful part of our investigation.

Resolved (on motion by **Mr Ciobo**):

That the committee receive as evidence, and include in its records as an exhibit for the inquiry into wireless broadband technologies, the document received from Karen Vought from Gold Coast Council entitled 'Microwave network Gold Coast'.

Mrs Vought—Do you want me to supply you with the technical details that support that as well? I can email that to you.

ACTING CHAIR—That would be wonderful if you could.

[12.11 p.m.]

McELHINNEY, Mr Richard John, Director, Conxtel Communications

MITCHELL, Mr Roger, Operations Manager, Conxtel Communications

RALEIGH, Mr Glenn, Technical Director, Conxtel Communications

RALEIGH, Mr Walter, Chairman, Conxtel Communications

ACTING CHAIR—Welcome. Although the committee does not require you to give evidence under oath, I should advise you that the hearings are legal proceedings of the parliament and warrant the same respect as proceedings of the House. The giving of false or misleading evidence is a serious matter and may be regarded as contempt of parliament. Prior to us launching questions at you, would you like to make an opening statement?

Mr McElhinney—Thank you very much for the opportunity to make a statement. First, I would like to say that the document we handed out and the document we tabled that is confidential are basically what was provided originally, plus a document that was generated by our founder, Glenn Raleigh, on the future of the wireless communication delivery systems. We encourage all of you to read that.

ACTING CHAIR—In relation to the first document, we have already accepted that. In relation to the second one with confidential parts, we will be moving acceptance of that as a confidential exhibit shortly.

Mr McElhinney—We also have a document that we are quite happy to share with you which has a lot more detail on the background of Conxtel. We have copies of that available and would be happy to share those as well, again as confidential.

ACTING CHAIR—Thank you again. We can take those as confidential exhibits.

Mr McElhinney—It may seem on the surface in reading the Conxtel information that we have a similar product to other last mile wireless providers. I can assure you that is not the case. Conxtel provides a very different solution that better satisfies the true needs of the majority of Australians. It particularly satisfies Australians living in regional and suburban communities and provides a solution that is equal to or better than that that is already provided to corporate customers in metropolitan areas. Conxtel provides a last mile and a first mile solution. This means that Conxtel does not need to connect to existing Internet services. We do not need to connect to existing DSL or to existing fibre. The connection to the Internet is directly to the US backbone through a two-way satellite link.

Please imagine the system. We have what we call a Conxtel community hub, and the Conxtel community hub is a single unit that is approximately the size of a 10-foot container. We can deliver this by truck to anywhere in Australia. Remote or unserviced areas are no longer a

problem using the Conxtel system. Once operational, it can cost-effectively service between 500 and 5,000 customers within a range of 35 kilometres from the hub and with no additional infrastructure whatsoever.

The system is also very flexible. Conxtel does not provide a single solution designed around a single frequency spectrum. Conxtel will determine the best frequency and the best technology based on the needs of the consumer. In regional areas, this is more likely to involve the use of free spectrum; because of the small population density, it will not become congested. It is also the most cost-effective means to deliver services to these customers. In suburban areas, we may use free spectrum or paid spectrum, depending on the needs of the area. Conxtel has the ability to migrate customers to different frequencies and technologies on an as-needed basis. You should have an image of the system as a stand-alone, low cost solution that provides a very high ability to service the customer. It is not something that is offered by other wireless last mile solution providers. I will close with the vision of our founder, Glenn Raleigh. Glenn's vision is to provide a geostationary satellite located above Australia with the ability to deliver one-gigabit-per-second communications bandwidth to each and every mobile and fixed unit in Australia. That vision is revolutionary, but it is not difficult to imagine and it is not difficult to achieve with time.

Mr W. Raleigh—When we were originally looking at broadband in Australia a number of years back and thinking about what was going to come up, we looked at it for regional Australia and remote areas. All of our thinking in the early days was based around that concept. You had to understand that two things that kill a lot of this stuff are distance problems and servicing problems in the distance areas. So we had to come up with a system that was able to handle the distance and also the service requirements in those areas. The business plan and business documentation were based around having equipment that was readily serviceable, so that we did not have to do truckrolls et cetera. This was all taken into consideration in the business planning while we were coming up with the Conxtel system.

Ms GRIERSON—You say that Conxtel's wireless protocols would ensure reliability and quality of service despite other users or increased use. What do you mean by that? If you were using a shared band, how would your protocols operate so that there was not a problem?

Mr G. Raleigh—We have implemented a client application across each wireless connection that sits in the background and monitors the quality of the link. It dynamically assigns the correct bandwidth depending on the RF conditions at the time. That means that the actual burstable limit of the device is never utilised, except in spike conditions. Most of the time, only a small portion of that available bandwidth is used.

Ms GRIERSON—So it is almost an oversupply?

Mr G. Raleigh—Exactly.

Ms GRIERSON—Another thing that is not clear to me from your presentation is that structures are required in each customer's location or premises—'an outdoor electronics unit with combined antenna'. Can you describe what that would look like; its size and bulk, and where you would locate it?

Mr G. Raleigh—It is about the size of a biscuit tin and is powered via the cable. The unit itself can sit on a balcony over a multi-user dwelling, be affixed to an existing antenna pole on a roof or be attached to the side of a window or wall close to the access required.

Ms GRIERSON—Thank you. I am sorry; it is in your latest submission and I had not seen it.

ACTING CHAIR—I might point out that at the moment we are in public session so if there is any evidence you want to give to us in private, in camera, we could do that at any point in time as a discrete section.

Mr CIOBO—I have got a number of questions that go to the core of your proposed roll-out. I am not sure if you would want to go in camera to answer those.

Mr G. Raleigh—No.

Mr CIOBO—I noticed that you say you have got a 35-kilometre footprint with an opportunity to extend that. For the average user, on the modelling that you have done, obviously there is a capital cost associated with a variety of aspects of your model. We have seen other examples of the outdoor antenna unit and the associated box which I think were placed at around $3,000 per unit. I am not sure if your model is similar to that but certainly that is what we have seen thus far. In terms of what I think you call your access point, the container, and those types of things, what is the average cost per user that you would be looking at?

Mr G. Raleigh—Half a million dollars for the box; servicing the customer end with an appliance that would range from $500 to $1,000.

Mr CIOBO—Your capital investment is half a million dollars and it can service 500 to 5,000 clients, approximately.

Mr W. Raleigh—That is correct.

Mr CIOBO—So as you reach saturation point you need obviously to invest in another one of these boxes.

Mr G. Raleigh—No. The unit is actually scalable, so that as the user level within a specific footprint increases, the box can be upgraded in a scalable fashion; therefore providing 100 per cent headroom over and above what is being used so that we consistently provide a quality service over the links.

Mr CIOBO—With that type of technology, depending on what it is being used for and how the radiofrequency is operating, we have seen other providers that, for example, have proposed to use CDMA 2000 technology and roll that out for fixed wireless and different things like that. Do you have the total flexibility to adopt whatever technology you want to use when it comes to accessing—

Mr G. Raleigh—That is correct.

Mr CIOBO—So it could literally be an 802.11 technology that you are using in a remote community versus in a metropolitan area, for example, using CDMA technology; is that right?

Mr G. Raleigh—We would not use CDMA but your method of deduction is correct. We would use a different method depending on the given region.

Mr W. Raleigh—Also, it has the flexibility to utilise all those bands. We will not use CDMA for a number of reasons which we will not state here, but if you were talking about from, say, 900 megahertz up in the Gulf country, that is certainly the case, right through the whole spectrum which you can see in the submission.

Mr CIOBO—Are you confined then to purchasing a licence to use different parts of spectrum and therefore you can limit services only in those spectrums or would you look at utilising technology on the basis of all the unlicensed spectrum?

Mr G. Raleigh—We would look at both, depending on which would be most appropriate for that given region.

Mr McElhinney—It really depends on the customer. If we have to buy extra spectrum because congestion does exist or we are forecasting that it is going to be a problem, obviously we will be going into that area and making a deal with one of the providers for that. If not, then we would certainly be looking at the free spectrum because it does make sense; it is a less costly solution.

Mr CIOBO—With, for example, 802.11, I noticed yours is only the second submission which mentions 802.16, which was just revealed to us a couple of weeks ago. With respect to that type of technology, what are your views on the likelihood of interference? If you have community networks, for example, that are operating in that ISM band, given the maximum power output—

Mr McElhinney—There are two issues there. There is certainly congestion no matter what, if you look at the overall picture. But the congestion does not necessarily affect our technology—not all of it, anyway. So things like microwave ovens and nonfrequency hopping products do not really affect us at all. With those that are doing frequency hopping, certainly there is going to be congestion based on who is using what and why but it is nowhere near as bad as is made out in the press. The press is talking about California, where they are not necessarily talking about frequency hopping or they are talking about both in the same sentence without realising what they are saying.

In reality, we do not foresee congestion occurring. We have a pretty good gut feeling that we will not see it on the Gold Coast, for example. We think we will see it in the CBD in Sydney. We have little doubt that will occur, but there is a lot more to Sydney than just the CBD. We do not see it as an all-encompassing problem; it certainly needs to be identified and addressed but it is not as big as a lot of people think.

Mr CIOBO—So it is overstated in a number of cases?

Mr McElhinney—Yes.

Mr CIOBO—What sort of dollar figure are we talking about for the average household?

Mr McElhinney—We basically intend to provide for the same cost as what is being provided in landline right now. It should not be any more expensive than that, and we will be providing a far larger bandwidth and a more reliable service. If you look at what Telstra is providing right now, I think I pay about $79 a month—

Mr CIOBO—With ADSL?

Mr McElhinney—Yes, for cable or ADSL. So we would be in that ballpark for sure, but we do not have the pricing model available to talk about it at this point.

Mr CIOBO—So what sort of throughput would you expect on the system?

Mr G. Raleigh—We will be giving dedicated throughput directly to the Internet through each device. That will be on a scaled plan: 64 kilobits per second, 128 kilobits per second or 256 kilobits per second, with variable rates for the upchannel. The burstability of each client's bandwidth is up to three megabits per second. Of course, that will vary depending on environmental conditions and so forth but, within the footprint, they can burst up to three megabits per second. Commercial and corporate clients will of course have higher headroom above that.

Mr CIOBO—It is not the technology that is the determinant here; it is part of your pricing model, I take it. So you could just upgrade depending on whether you want to pay the price, basically?

Mr G. Raleigh—That is correct.

Mr CIOBO—Let us assume that over time we will have more resource-intensive applications being developed and people wanting to increase that. Again, that would be part of 'scalability', as you phrased it?

Mr G. Raleigh—That is correct, and also migrations to specific frequencies that can allocate that throughput.

Mr CIOBO—Sure.

Mr TICEHURST—On your diagram, you are showing the Internet only provided by the US on satellite.

Mr G. Raleigh—That is correct.

Mr TICEHURST—So what about local telephony?

Mr G. Raleigh—Local telephony will be gatewayed at the hub. In other words, if there is a Telstra line close by, we will incorporate a gateway within the Conxtel hub and connect that gateway to it.

Mr TICEHURST—Will Telstra allow you to do that?

Mr G. Raleigh—I am using Telstra as just one example. There are many different providers that we can actually connect to.

Mr W. Raleigh—We have been talking to a number on that issue, and it would not be an issue because they get the through traffic.

Mr TICEHURST—So Australian Internet provision could come in through that direct link rather than go to the US and back?

Mr McElhinney—It would be very similar to what TransACT has done in Canberra where they have hooked in through Telstra. Again, we do not have to go through Telstra if we do not need to.

Mr TICEHURST—Is the satellite L-band or C-band?

Mr G. Raleigh—The satellite is a combination of C-band and KA. It incorporates a bidirectional C-band system which is burstable to 45 megabits and nine megabits back. Also incorporated into that is a 155 megabit KA spot band so it is actually tridirectional.

Mr TICEHURST—So you do not envisage a lot of weather problems? If you get poor weather, it usually affects the satellites quite dramatically.

Mr G. Raleigh—High cloud and ice in the upper atmosphere can affect the KA band. That is why we have the C-band as the fall back backbone for the system. The C-band is very robust. Even in very severe thunderstorms, it can still provide adequate service.

Mr TICEHURST—Is it typical satellite latency?

Mr G. Raleigh—There is a latency over satellites for high quality type, real time applications—gaming, voice telephony. Because our main business is data traffic, we have mechanisms in place to actually pipeline the bandwidth so that it does not appear to have a latency. That is facilitated with intelligent caching systems, on both the backbone and within the hub, that talk to each other and coordinate the transfer of the traffic.

Mr TICEHURST—You are saying that you can set up one of these units in 48 hours. What sort of facility would you need to mount your hub?

Mr G. Raleigh—We would require an area that would be, say, a rooftop of a building—it could be right next to a council chambers. It incorporates its own telescopic mast so there would be no approvals required once the footprint was made available.

Mr TICEHURST—What size is it physically?

Mr G. Raleigh—Approximately half the size of a 20-foot shipping container. The box would be delivered via truck or trailer; the satellite dishes would sit, collapsed, inside the container as

it arrives at a particular location. Those antennas would be taken out, assembled on top of the roof of the container and then fitted. Connection is made, power connected to the box itself—or a generator, if it is an emergency situation—and access could be incorporated over quite a large area quite quickly.

Mr TICEHURST—Is it in operation anywhere in Australia?

Mr G. Raleigh—No. We did testing on the components but, as you know, it is a money situation: you have to give them back.

Mr TICEHURST—That is right.

Mr McElhinney—There was one question asked on the latency that I think needs a bit more clarification. Obviously, if you are doing voice, latency is a major issue using satellite. It is real time, therefore any amount of trickery is not going to solve that problem. If it is for a regional area, they may very well be quite satisfied with the latency because they do not have the service otherwise. If it is in a metropolitan area or a suburban area, then obviously we are going straight into the gateway and we are not using the satellite—we are bypassing the satellite for that.

Mr G. Raleigh—And just to clarify: within the coverage area of the box, there is no latency. The latency is negligible.

Mr McElhinney—Eighty per cent of the information is cached locally anyway, so it is not that big an issue.

Mr TICEHURST—And local phone calls would be within the hub.

Mr G. Raleigh—They can be facilitated on a user basis, and going in competition to existing models that are emerging, to provide local free telephone.

ACTING CHAIR—Following up on your last point, are you effectively providing a mirror site?

Mr G. Raleigh—No. We are providing services using edge technology. We are providing it from the edge.

ACTING CHAIR—Which is pretty recently developed?

Mr G. Raleigh—That is correct.

Mr W. Raleigh—The whole thing is you must look at this as a concept that does not have to rely on any terrestrial infrastructure that is currently in place. It can utilise that infrastructure. For instance, if we had our satellite set-up or our community hub down here, we could, through an agreement with the existing cable people, service people in a place like Dingo, out from Rockhampton, or in Dysart, or wherever, even though it is a long way away. But we would utilise that infrastructure that is already there. So what I am saying is we do not rely on it, but we can use it.

ACTING CHAIR—If you are not setting up as mirror site, then how have you got 80 per cent? What caching system do you use to actually get away with the latency problem?

Mr G. Raleigh—The way that we have actually designed that is quite confidential.

ACTING CHAIR—Do you want to do that in camera?

Mr W. Raleigh—Yes.

Mr G. Raleigh—The technical details of it are confidential, but the concept is public knowledge. There are certain companies around the world—Flow-ware, Akamai, RapidCache—which have intelligent algorithms built into their caching systems that basically will go and search your computer's bookmarks for all the web sites on there, look at your surfing habits in a log set-up and analyse the statistical data within that to pre-empt your web-surfing experiences.

ACTING CHAIR—So it is a reverse Google?

Mr G. Raleigh—Almost like a reverse Google, yes. Incorporated with that are the facilities to actually cache streaming data. If you incorporate a CNN web site into the cache, it will draw down the most popular streaming content and place that at the edge so that when you hit your CNN bookmark, it appears instantly with all the video and every little piece of content and artwork, but the actual news stories will be pipelined through. So, as those are appearing on your desktop, the information received from the actual CNN web site will be pipelined. To the user it will appear to be very quick, over and above the existing systems where you can wait for 15 to 20 seconds to get a response, even on cable.

Mr W. Raleigh—We have taken the five-second rule from the US as our benchmark.

ACTING CHAIR—Can you explain a bit more about what happens with the roving nature of this? If you are the only one providing the service out in a country town, it is reasonable: you choose your bandwidth; you use 802.11a, 802.11b, 802.16 or whatever, or you choose to use something else. But if there is another provider in the country town using a particular part of the spectrum and if there are also local community groups out there doing it all on their own because they want to use part of the unallocated or unlicensed spectrum, how does that affect the way you do the roving? Do you have to skip and hop over those or do you use that spectrum as well as them?

Mr G. Raleigh—We always hop over everybody else. We use the frequency-hopping method of spread spectrum, not direct sequence. Even though it does not have the upper ranges in performance of direct sequence, it is a more robust system and it is mil spec.

ACTING CHAIR—You are going from unlicensed spectrum through to licensed spectrum. In remote and regional areas you should not have a problem. But if you get into Sydney, where we have a number of providers at the moment lining up to provide services in Sydney, how would it operate then? They have actually paid for their particular band and so on. Do you just completely skip their band?

Mr G. Raleigh—To look at it completely, we are not metrocentric so we will never have the metrocentric disadvantages. In a situation where, for example, we started to operate on the Gold Coast and there were specific wireless operators using specific bands of frequency, we would locate the specific frequency that would be the sweet spot for our system and work backwards from there. That may call for us to incorporate leased spectrum. So we may have part of the system in a leased spectrum and part of the system in a free ISM band. We can actually do both.

ACTING CHAIR—That depends upon whether the people who own that spectrum will release it to you?

Mr G. Raleigh—That is correct.

ACTING CHAIR—They want to make the money back the other way?

Mr G. Raleigh—That is correct. We have also had discussions with the holders of these particular sweet spectrums, and they are quite receptive to that sharing arrangement because they have a large amount of spectrum that is underutilised in real time. They do use it for bursting certain systems, but we can work around their burstability by migrating to specific spectrums for instantaneous connections and then coming back to the original connection.

ACTING CHAIR—I think you were here while the last witnesses gave evidence.

Mr G. Raleigh—We have had good discussions with the Gold Coast Council, both with Karen and the CEO. They have expressed excitement for what we can do and also expressed a need yesterday for it.

ACTING CHAIR—In terms of the hearing-impaired people, TEDICORE and the others, they indicated in their evidence that there is a real problem with Telstra's wireless local loop. Have they got a problem with you as well, or have you taken those disability problems into account? Have you had any discussions with those kinds of groups? Or is it in the nature of the technology at the moment?

Mr G. Raleigh—We arrived a little bit late to hear their evidence. Maybe you could fill it in.

ACTING CHAIR—The wireless local loop that Telstra had put in place effectively disbarred people using TTY machines to gain access to it. They had not properly consulted with users. There was the trial, I think in King Island, and a series of problems became evident. Telstra took some measures to try and overcome them but they have still got the problem that most of their users cannot actually use this wireless local loop, so they have been effectively cut out of taking the step forward that they need to take. Have you had any discussions with people with disabilities?

Mr G. Raleigh—I have not.

ACTING CHAIR—Have you given any thought to those sorts of issues?

Mr W. Raleigh—To be quite frank, we have not at this time, but I will take note of that and I will go and have a look at those. I do not see it technically as a problem, but it certainly needs to be addressed.

Mr G. Raleigh—There could be power issues and hopping sequences that may need adjustment to overcome those limitations. But there is always a solution to a given problem in the RF realm.

Mr W. Raleigh—The whole idea of this was that we could hook up anyone who is out there using the RF. For instance, you talked about these community groups that are setting up in Brisbane, Sydney and all over the place. It would not take too much for us to hook them in. They would get broadband very cheaply. So we are not worried about those people coming in and talking and working with us because it just complements it as far as we are concerned.

ACTING CHAIR—How do you view the topographical problems that you potentially have in front of you with the roll-out? Is it mostly line of sight?

Mr G. Raleigh—No, our system incorporates both, non line of sight and line of sight technology. The propagation of the system is done primarily off GIS data. We would go into a specific region and have all the information required for the topology, the access facilities, whether or not there are military or aviation restrictions—there is a long checklist of things have to happen before we actually go into a specific area. Once we actually arrive, there would be only limitations in access to power, recruiting somebody locally to actually maintain the box. There are a number of different procedures that we have in place that we would kick in once we were given the go-ahead for a particular area.

ACTING CHAIR—What are you using for the non line of sight stuff?

Mr G. Raleigh—Non line of sight uses OFDM propagation. There are two specific products we have. One can actually move down in frequency depending on whether there is an obstruction or a frequency condition that is unacceptable. Also the 802.16 does not have line of sight problems. In other words, it is a non line of sight product. When you look at the ultra wideband systems, they are do not require line of sight: they go through walls, go through concrete, go through 17 metres of granite.

ACTING CHAIR—So that is part of the helping the spectrum thing? You don't go down to whale song where that is necessary, or up into the higher reaches where that is necessary?

Mr G. Raleigh—No.

ACTING CHAIR—What is the fundamental nature of the 802.16? As Mr Ciobo pointed out, we have heard that mentioned but we have not got much information about it yet.

Mr G. Raleigh—The 802.16 is very similar to the IEEE802.11 platform. It utilises RF frequencies to propogate data. It is a mechanism for transferring the data across a given medium. The technology is quite unique in its usability of the frequencies. That is where its main advantage is—in the reusability of given frequencies. It works in different frequency

bands than the 802.11a, b, g, and h, and it has certain characteristics to provide the user interface at a very low power.

Ms GRIERSON—Who do you see as the most likely host for your community hubs? Are there any planning problems regarding locating your community hubs?

Mr W. Raleigh—PricewaterhouseCoopers did our business plan. In our business plan we recognised local councils would be a suitable host—would be the dealer, in other words—

Ms GRIERSON—I thought so.

Mr W. Raleigh—or a utility provider of some description, or a big ISP that was in the town and well known that was having problems.

Mr CIOBO—One thing that I did not fully understand was with regard to the link back to the satellite. I think you said you got a burstable speed of 45 megabits per second—was that right?

Mr G. Raleigh—Yes, coming down from the satellite, inbound.

Mr CIOBO—If you have a saturated area—I realise these things are scalable—does a bottleneck occur there? I would have thought it would not take long to chew up that bandwidth.

Mr G. Raleigh—Do you mean the 45-megabit burstable?

Mr CIOBO—Yes. That is essentially your entire link back to the US, isn't it?

Mr W. Raleigh—The link going back to the United States backbone is nine megabits per second. The signal coming back from the United States is 45 megabits per second. That is surplanted by a 155-megabit per second KA stream. So your requests for information are going back at very slow speeds. But we have envisaged companies that require large file transfers between corporate divisions. You might have John Deere in the United States needing to transfer the complete parts lists and brochures to John Deere in Australia. If they came through Conxtel, they could burst that pipe to 45 megabits and deliver those large files securely very quickly, and then the pipe would close down to the two or three megabits of its regular traffic.

Mr McElhinney—I think the point of your question is: does it bottleneck? The answer to that is: it will bottleneck per Conxtel hub, but if it does you put another one next to it.

Mr CIOBO—So that is just per hub?

Mr McElhinney—Yes, per hub.

Mr CIOBO—That is fine. I thought that was the whole thing. I was getting confused, but that makes perfect sense.

ACTING CHAIR—Going to the cost of the hardware to the people who are going to have that put into their house: is that part of—

Mr McElhinney—We are going to run that, again based on what I said earlier, it will be similar cost to—

ACTING CHAIR—So it is incorporated in the rental?

Mr McElhinney—Yes. We will amortise it over the period of the contract.

ACTING CHAIR—When do you look at kicking off?

Mr W. Raleigh—As soon as we get some good finance.

ACTING CHAIR—That is still in process?

Mr W. Raleigh—That is still in process.

ACTING CHAIR—Well, good luck! The final question is: one gigabit per second, when?

Mr G. Raleigh—According to NASA it is about six years away before we will actually see it. They are now going into the new system, which is 650 megabits per second. The equipment for that is extremely expensive, but we look at that coming down drastically in the next couple of years as the market becomes receptive to it.

ACTING CHAIR—So that capacity is being put into the new generation of satellites?

Mr G. Raleigh—That is correct.

ACTING CHAIR—And that is still happening despite the problem we have had with a range of those prospective satellite—

Mr G. Raleigh—The main problem in the satellite industry was in the low earth orbit business models. The problem with low earth orbit systems is you need tracking, and the tracking systems are what make it terribly expensive. The geostationary satellites of course have latency problems which, with the laws of physics, you just cannot undo, but they are utilising different modulation techniques to actually reduce the latency.

ACTING CHAIR—Thank you very much.

Resolved (on motion by **Mr Ticehurst**):

That submission No. 51.1 from Conxtel dated 9 July 2002 be received as confidential evidence to the committee's inquiry into broadcasting and that the submission not be authorised for publication.

Resolved (on motion by **Ms Grierson**):

That the document presented by Conxtel, 'An introduction to Conxtel Communications', be received as confidential evidence to the committee's inquiry into broadband wireless.

Resolved (on motion by **Mr Ciobo**):

That the committee authorises publication of the evidence given before it at public hearing this day, including publication on the electronic parliamentary database of the proof transcript.

Committee adjourned at 12.53 p.m.