

# ROAD SAFETY COMMITTEE

## Inquiry into driver distraction

### Notes of discussion

Melbourne — 6 December 2005

#### Members

Mr B. W. Bishop

Mr J. H. Eren

Dr A. R. Harkness

Mr C. A. C. Langdon

Mr T. W. Mulder

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Mr I. D. Trezise

Chair: Mr I. D. Trezise

Deputy Chair: Mr E. G. Stoney

#### Staff

Executive Officer: Ms A. Douglas

Research Officer: Mr G. Both

#### Witnesses

Professor I. Johnston, director;

Dr M. Regan, senior research fellow; and

Ms K. Young, research fellow, Monash University Accident Research Centre.

**The CHAIR** — Unfortunately we do not have a quorum of members, so we will list this as notes of discussion. The important thing there is that under this hearing we are not covered by parliamentary privilege although we will be taking a record through Hansard. Thank you; we appreciate your input.

**Prof. JOHNSTON** — It is always a great pleasure to come along and talk with the committee on the various issues that get examined. They have all been important, but this is one that is particularly topical and especially important and will become increasingly important as time moves on. We are really lucky. We have done a lot of work in the driver-distraction area generally and Mike Regan is one of the leading figures internationally. Michael will make most of the presentation assisted by Kristie. At times it might appear as though we are doing a slow-mo replay of stuff you heard from VicRoads yesterday and that is really because it commissioned us to do the literature search for it. Whilst the recommendations it made are entirely its business, we did the search of the literature and informed it of all the work that has happened. There will be a bit of duplication. Because it is a large written submission — 120-odd pages — we would like to make a presentation which we will try to keep as brief as we can; you are welcome to interrupt with questions as you like, but there will be some advantages in holding some of it over and having a discussion at the end. But by all means come in as you want if you want things clarified along the way.

**The CHAIR** — We will try to resist the temptation.

**Prof. JOHNSTON** — You do not have to resist, but there may be some where we will say, ‘We will get to that in a little bit of time’.

#### **Overheads shown.**

**Dr REGAN** — Thanks very much for having us here today. I thought I would start with a definition of ‘distraction’. It is fair to say it is a concept that is very poorly defined in the literature, which might be surprising to some of you. As far as I am concerned — and this is a definition I have coined publicly before because I do not like the other definitions that are in the literature — it occurs when a driver engages, either willingly or unwillingly, in any secondary activity that interferes with performance of the primary driving task. It is a fairly broad definition, but it encapsulates the fact that humans are not generally good at doing two things at once. We have a brain that is not wired up to simultaneously attend to two or more activities at the same time, especially if they involve a lot of attentional demand and especially if the tasks are quite similar. Humans fundamentally are not good at doing two things at the same time and that is why distraction is a problem.

There are different mechanisms that underlie the effect of distraction. There is visual distraction when our eyes are taken off the road — for example, if we are dialling a mobile phone. There is attentional distraction when our minds are, so to speak, taken off the road — for example, when we are listening to a mobile phone conversation. Physical interference can occur when we are interacting with some technologies — for example, if we hold a mobile phone with one hand and we try to steer with the other hand there could be a situation when we need fine steering control and it will not be as good if we do not have both hands on the wheel. The other effect that occurs if you take one hand off the wheel is that sometimes structural interference can occur. You may have had the experience of trying to turn the radio knob in one direction and find your steering wheel ends up going in the same direction and you start drifting off the road. It is a bit like trying to rub your tummy and pat your head at the same time. We are not good at coordinating two activities at the same time. Most of the time that distraction occurs it involves one or more of these different mechanisms.

People sometimes ask why it is that distraction all of a sudden is a new problem. I think it is not a new problem at all; it has been around for quite a long time. The reason why we are probably only recently becoming more acutely aware of the problem and its potential effects on driving performance is that there is no good operational definition of distraction. We currently lack certain tools to be able to measure its effects. There is limited research on this topic — far less has been done on it compared to other topics in road safety. Until recently there has been a lack of public awareness of the issue, but as we will discuss in a moment there is a great lack of public awareness of some issues surrounding driver distraction. There is a lack of accurate crash data to drive countermeasure development in this country and this particular jurisdiction. The recent proliferation of a range of technologies that are finding their way into the car cockpit has heightened people’s awareness of the role of distraction.

We have to go through each of the terms of reference for the inquiry and make a few points that address directly the issues you wanted addressed. As Ian said, what we are doing here is summarising in about half an hour slightly more than 120 pages. If you want more detail, it is all contained in the submission you should have.

We will start with the mobile phone. It is an interesting device. Five years ago it was used for talking; now it is used for texting; to download video clips from the Internet; it can be used as a navigation system; to play games; and even in some countries to pay bills by beaming a signal from the phone to a machine that registers you have paid for something. Not surprisingly, given its multifunctional capabilities, it is a very popular device. Eighty per cent of Australians own mobiles; most of them are younger people. Even though it is technically illegal to use a hand-held phone in the country, we know from a number of surveys now on average 30 per cent of people admit to using hand-held phones while driving, some of them regularly. We know that nearly 60 per cent of drivers, mainly young drivers, admit to reading text messages while they are driving and nearly 40 per cent, which is a particular worry, admit to sending text messages while they are driving.

**Mr LANGDON** — These figures were also shown to us yesterday and the thing we picked up was only 2 per cent of the drivers were observed using hand-held mobile phones yet all the figures would indicate that a lot more than 2 per cent use it. Policing it is exceptionally difficult if only 2 per cent can be picked up.

**Dr REGAN** — The 2 per cent is based on observational studies and it depends on how well designed the observational study is.

**The CHAIR** — We figured it must have been done during the night.

**Mr LANGDON** — And everyone had tinted windows.

**Dr REGAN** — Possibly. The figures of 40 and 60 per cent respectively are taken from self-reported surveys. With the observational studies we know that if most people are sending text messages rather than using them to talk, one of the problems is it would be much harder to see them using the devices because when they text we know they hold them down low because they can get away with it. That in itself is an interesting issue that I was not going to go into, but we have a whole system that is really geared up to use the phone to text messages more than to talk. It is cheaper to text and it is easier for them to get away with doing that. The sad thing is that the people doing that are the young people and, as we will see, they are much more vulnerable to the effect of distraction.

**The CHAIR** — The worrying thing about those figures is that more than one in three drivers is prepared to drive and text at the same time. That is not just stunning, but a major worry to the community.

**Prof. JOHNSTON** — When we get to the end and start talking about enforcement issues, one has to think about using technology to do the enforcement rather than the police. It is going to be a very big ask.

**Dr REGAN** — The impact of hand-held phone use on driving has been widely studied, compared to other technological sources of distraction, mainly in driving simulators and test tracks. The focus has been on using the phone to talk and to send text messages. A recent study we did at MUARC is the only significant study that has been done on text messaging. So we do not really know a lot about texting, apart from the work we have done at MUARC.

Using a mobile phone can distract drivers visually, attentionally and cause physical interference, and as you can see from that slide many aspects of driving performance are affected when a hand-held phone is used. What is significant about this slide is that it shows that different phone tasks — such as dialling it, talking on it, or texting — can in some cases degrade performance in the same way. We know from performance studies that degrades performance. There is a public perception out there — and we know it is a real one — that hands-free phones are relatively safe and that they do not have the same effects that hand-held phones do. But it is quite clear from a large amount of accumulating evidence now that hands-free phones degrade performance similarly.

**Mr LANGDON** — You still have to dial a number and all that with a hands free.

**Dr REGAN** — Absolutely. I think there is a public perception out there that it is the holding of the phone that is the problem. In my opinion, even though there have been no studies to prove it, that is probably one of the less significant problems. It is really the visual and attentional distraction. The performance impact for hands-free and hand-held phones is, as I said, fairly similar. They both degrade performance in similar ways. But there are

some slight advantages in using a hands-free phone. Dialling with a hand-held phone can be more distracting than dialling with a hands-free phone. Drivers tend to answer hands-free phones faster than hand-held phones, and driving with one hand and changing gears while using a hand-held phone could degrade driving performance more so than with a hands-free phone, although there is no research to prove that.

**Mr STONEY** — Only if you are smoking as well?

**Dr REGAN** — That is right.

**Mr LANGDON** — And drinking coffee.

**Mr STONEY** — And drinking coffee and talking and changing the radio stations.

**Dr REGAN** — I am really glad you raised that point, because that is one of the key points we want to make here — that is, that all of these things are going on at the same time and together they can come together to break down performance. We certainly know that reading and sending text messages is more distracting than talking. Although there has not been a study that has been directly done to prove that, we can confirm that with our research at MUARC. So texting is probably our major concern at the moment.

Crash studies use police-reported crash data to estimate the proportion of all crashes in which driver distraction is a contributing factor. As to the proportion of just distraction-related crashes, it is estimated from overseas studies that between 1.5 per cent to about 10 per cent of crashes in which distraction is a contributing factor relate to mobile phone use. What we can say from the work we have looked at is that of all the technologies, the mobile phone tends to be the one that stands out as the one that is contributing the most to the distraction-related crashes.

**Mr LANGDON** — On the issue of distraction-related crashes, yesterday Victoria Police submitted to us the causes of fatal crashes. They include alcohol, speed, failing to give way, fatigue, driver error and rear-end collision. Nowhere in the submission does it say 'driver distraction'. One of the issues we also picked up yesterday is — and these are the figures for 2004-05 — for example, driver error makes up at least a third of all the figures. But that is all it says — 'driver error'. It might be the case that a coronial inquest finds out that a phone has been involved, but that is never converted back to the figures. What do you think of that? Do you think they should be?

**Dr REGAN** — What I think that is reflecting, as we will talk about, is the fact that the accident reporting forms, especially here in Victoria, allow for almost no recording of distracting events as a contributory factor in crashes. The studies that we have come across that give us a feel for what the impact of distraction is on crashes are ones in which there are accident reporting forms that contain specific categories relating to different sources of distraction. I think that is one factor.

**Mr LANGDON** — You would recommend a change, then?

**Dr REGAN** — Absolutely, and we will recommend that, certainly, towards the — —

**Prof. JOHNSTON** — The difficulty with the police accident reporting system is that if you ask them to collect a thousand different things you will not get any of them very well. What we tend to think is that it is better if you can do a short-term study for, say, a four-month period where you will give them a supplementary data form to get a whole lot of detail just on distraction; that way you will get a snapshot and it will be of a period of time — rather than trying to get them to do it routinely, because you then have to get all the police trained and get them to do a whole lot of additional stuff. So there are other ways of doing it than getting a routine ongoing police form. You could repeat that every two years, for example, and then get a time series for what is happening.

**Mr STONEY** — You are suggesting that we might recommend something along those lines as part of this report?

**Prof. JOHNSTON** — Absolutely, and we will come to that when we do the recommendations. But I think that is probably a more useful way to go than trying to get the police to put it on the routine accident report form.

**The CHAIR** — We also heard of a study in New Zealand where presumably that is what they did. They looked at a group of crashes in a particular time line and came up with findings.

**Dr REGAN** — We have reviewed that research in our report and the data that I will be talking about today also makes reference to that study. Can I say also in response to your question, which I think is a very interesting one, that we know from work that has been done on driver distraction that people can go one of two ways when they are distracted — they either slow down to compensate for the effect of the distraction, or they speed up. They sometimes speed up because distraction interrupts the feedback loops that enable them to monitor their speed. When it is said that a crash at a crash scene is due to speed, it might be, for example, that the person was distracted and as a result of the distraction they sped up. In my opinion there is still a lot of work to be done to get the classification of crashes, when they occur, correct so that we know that when someone has run off the road it was, for example, distraction that caused them to run off the road and not fatigue, because people can also become distracted the more tired they get.

**Mr STONEY** — I assume another factor that would not be reflected here is the amount of traffic and things going on around. Are most of these crashes in heavy traffic, or are they in lighter traffic or in rural areas? It is quite distracting just driving and watching for other vehicles and what have you. I have just come in from the Western Ring Road, and it is quite distracting. You would be more likely to be closer to having an accident with a minor distraction with the phone than you would be right out in the Mallee somewhere?

**Dr REGAN** — That is true, and at least one study that we know of has shown that increases in traffic density increase distraction-related crashes and in fact make you more vulnerable to the effects of distraction. That is quite true. I want to say that in addition to knowing what proportion of distracted-related crashes mobile phones contribute to, we know from epidemiological research that there is, on average, about a four-times increase in crash risk when you use a mobile phone — that is regardless of whether it is hand-held or hands-free. Australian research in the last six months has proven that as well. That increase in crash risk is roughly equivalent to having a blood alcohol concentration of .08. So we are not talking about an insignificant increase in crash risk; it is a real one.

We will now move to term of reference 2, which relates to the use of video devices by drivers. We have taken in-car video devices to mean DVD players and TV systems, which are normally integrated as the one unit, even though we recognise that these days there are some mobile phones that can play back video information. DVD players, especially portable ones, are in high demand in Australia, according to our discussions with vehicle manufacturers and local retailers, but we do not know how many of these systems are currently fitted to vehicles, either factory-fitted ones or portable ones. We understand that TVs are less popular because the reception is very poor as you drive around, so there is not a great demand at all for those.

As you probably know, factory-fitted DVDs can be roof mounted, they can be put behind the driver's seat and even behind the headrests — they can be placed in a number of areas. There is a Victorian road rule — no. 299 — which prohibits drivers from driving a vehicle with a TV or visual display unit if any part of the screen can be seen by them while they are driving, unless it is a driver's aid. They have a definition of what they regard as a driver's aid and that is mainly for things like route navigation systems which are regarded as driver assistance systems. In terms of the DVD players, we do not know how many drivers use them illegally, although the police tell us that they issue about 30 traffic infringement notices a month for violation of that particular road rule.

**Mr LANGDON** — For having the DVD visible from the driver's seat, someone is watching it next to them?

**Dr REGAN** — That is the information we have, so they must be able to tell that they are using these devices illegally. There is no published research on the impact of DVDs on driving performance, although we do know that a study was recently commissioned by the Roads and Traffic Authority in Sydney and is being undertaken by the University of New South Wales injury risk management centre. The study was finished some time ago. We tried to get access to the data but the RTA would not allow its release so we cannot tell us anything about that. What we can say is that we, as human factors researchers, think if these devices are used illegally, they would be highly distracting. They are certainly visually distracting because drivers would be encouraged to take their eyes off the road frequently, and would be distracting one's attention because people would be paying attention to try to follow a movie plot that is going on behind them even if they cannot see the device, and it is the sort of device that would be playing for a long time if you are listening to movies so the propensity to be distracted would be great over a long time period. Interestingly this road rule also makes it illegal for these units to distract other drivers. We think that is an interesting thing because we certainly have not seen any research to indicate that having these devices in a car distracts other drivers.

**Mr LANGDON** — Has anyone been fined because of that? For example, if it is on the back headrests and the driver cannot see it but the driver next to them could — has anyone had a fine issued on that one that you know of?

**Dr REGAN** — It is a good question. I do not know and I cannot imagine that a policeman or woman would be able to make that judgment. If it is distracting, I suspect it would probably be at night and it would be only momentarily as they get a glimpse of a screen sitting in there. I suspect it would probably be at lower speeds or when the vehicle is stationary. The flipside of course is these devices are great for parents if the children in the back can watch and listen to them with headphones because that means you do not have yapping kids in the back distracting you. There is a flipside.

**Mr LANGDON** — There is some data on that — the chairman and I both used them when we drove to Queensland — the kids were happy and we were happy.

**Dr REGAN** — We certainly would advocate those ones where they have earplugs and the kids can listen without you being distracted. In conclusion, I think we would say for that one, we do not know a real lot about it but we suspect that if used illegally, it is probably dangerous.

Term of reference 3 relates to sources of distraction outside the vehicle. There are many sources of distraction both inside and outside the vehicle other than the mobile phone. As yet no-one has developed and published an adequate and comprehensive taxonomy of all the categories of distraction inside and outside the vehicle so there is further work to be done on that topic. However, as you can see from the slide we can loosely bundle the different sources of distraction into those that relate to the use of technologies inside the vehicle, those that relate to non-technological-type activities that go on inside the vehicle, and distractions arising from outside the vehicle.

Within the vehicle you have entertainment systems like radios and CDs and DVD players. You have information and communications systems like the mobile phone, email and Internet facilities, which are now available in high-end vehicles in Australia; I think the BMW 9 Series for the last six months has had Internet and email access available. There are also advanced driver assistance systems which provide you with warnings if you are about to collide with a vehicle ahead of or behind you or in your blind spot. There are other systems which automatically warn you if you are driving over the speed limit or if you are about to drive off the road. All of those systems provide information and warnings.

Inside the vehicle there are a whole range of activities that go on and have been going on forever and a day. There are unspeakable things that go on inside cars that truck drivers tell me about. I will not go into them on the public record but they can also be distracting. Outside the vehicle, when pedestrians behave in unusual ways, when emergency vehicles are flying around the streets and when people see provocative advertising and that sort of stuff it will capture, unwillingly, your attention, as opposed to some of these other activities which people are more likely to willingly engage in.

**The CHAIR** — Eating and drinking, we have all done it for time immemorial. Is there any type of research that shows what a distraction that actually is?

**Dr REGAN** — We will talk about it in a moment. We have a lot of detail about that in the report and we will brush over it here. I wanted to say that with the technological stuff there are a lot of ergonomic issues involved here. I certainly will not go into detail because I have talked about this in the report, but if visual displays are badly designed and located, if the information that they display is badly designed, if the controls are poorly designed and located and if there is no system on board the vehicle to coordinate the presentation of information from these systems and prioritise it so the driver is not suddenly flooded with multiple warnings for multiple systems, then there is massive potential for distraction. This is probably one of the main issues that we are worried about as a group.

**Prof. JOHNSTON** — But it is also one that I think is under your — control. One of the things we recommend is that there be a mechanism by which the suppliers of this stuff have to demonstrate that they have the right kind of design which minimises distraction. However, that is not happening at the moment.

**Mr STONEY** — I could not agree more. I think a lot of this stuff is designed by bright young men and women who do not understand that as you get older your eyes take longer to absorb what you are looking at.

Sometimes you have to look at it for a fair while because it is so small or badly designed. I am sure that is a big issue, a lot bigger than we realise.

**Dr REGAN** — Absolutely, and we will talk shortly about some data on that topic of the effects of ageing on vulnerability to distraction. There are also some technical features coming into cars which we need to be very mindful of in dealing with this issue of technology. We now have what are called open architecture technologies coming in so that you can bring in your personal digital assistant and at the press of a button that information can be sent to the instrument cluster inside the car — you can already do that in a Holden, for example.

You can now look at your spreadsheet in the central instrument cluster of the vehicle, or any other information the system allows you to beam through to the car. You now have a communication between the car and these portable devices. You have what we call multifunction displays where you have a central display in the car, a whole lot of buttons surrounding it and in the case of some upmarket vehicles multilayered menu systems that you can work your way through to access different functions — the system provides absolute flexibility in getting whatever you want to access. That can be a problem if those menus are not well designed. We know it is hard enough to do when you are just studying at a desk in front of a personal computer.

Finally, there are so-called configurable interfaces, and certainly in some Japanese vehicles it may be possible to buy a car and change the design of the information that is displayed on your dashboard. If you do not like the way the speedometer is designed, you can change it. If you do not like the way the fuel gauge is designed, you can change it. If you give people an unlimited ability to do that, they are not ergonomic designers themselves and they could be designing the displays in a way that greatly distracts them. So to finish off this section of the presentation, we have managed to track down information on studies that relate to what effect some of these technologies have on driving performance other than a mobile phone, and we will give you a brief overview of those systems that have been studied.

Route navigation systems are now very common in vehicles, especially fleet vehicles and upmarket vehicles. The research that we have reviewed suggests that they are very effective in reducing navigation load, especially for young drivers. They are distracting if they allow people to enter the destination they want to go to while the car is in motion, and some systems allow you to do that. They are distracting if they provide no auditory guidance on how to get to a destination, and some of the complex visual displays can be distracting. So the simple, well-designed displays are good. What we can conclude for this system is that if it is well designed, it is far better than using a paper map display. If it is badly designed, then it is only marginally worse than a paper map. So these systems can have some safety benefits.

**Prof JOHNSTON** — But I think the key point is that there is not yet appropriate attention to what we call the human-machine interface. They are providing a benefit but you can take the distracting elements out with better design.

**Mr LANGDON** — Is there a design mode out there? Has VicRoads done anything?

**Prof JOHNSTON** — No, not to my knowledge at this stage. I do not think any Australian authority has yet brought in a standard.

**Dr REGAN** — There are international standards. I sit on an international committee that designs the standards for the design of these technologies. As far as I know there is one that exists for this particular system, but at the moment it is left up to the vehicle manufacturers — and I will talk about this in a moment — as to whether they choose to adhere to the ergonomic standards that I am referring to, and that is a problem because there is no-one at the moment actively encouraging them to do so. So we can come back to that.

Radio tuning is a very common task. Typically there are multiple ways of tuning a radio, not all of which are the least distracting ones. What we know from research that has been done is that even tuning the radio can be distracting. It takes your eyes off the road more than dialling on a mobile phone. It can degrade your ability to keep within your lane. It can increase mental workload, degrade your ability to control speed, delay your reaction time to unexpected events, and it has been found to be harder for younger drivers. Even listening to a radio can degrade lane-keeping performance. So this is a classic example of a system that has been around for 40 or 50 years and until recently we had no idea that it affected performance.

As I said, email facilities are starting to come into vehicles. It has been suggested that if you issue voice commands to call up your email, and if the email is read back to you, then you should have a system that is not distracting. But studies have shown that even if you do that, you can see on the slide that there is a deterioration in driving performance. We do not know if there is any data at this stage on the increase in crash risk associated with using email facilities. I suspect it will be a while until we have that data because those systems are only just coming into high-end vehicles.

**Mr LANGDON** — With BlueBerries and all that, you can do it on a handheld.

**Dr REGAN** — That is a really good point. With all the portable devices coming in now, you can access email from them. We do not know anything about portable devices at this stage and their effect on driving performance for the different range of functions that they provide, except for the mobile phone.

CD players have been compared to dialling on a mobile phone in relation to driving performance and the way you can see. It has been found that voice control of CD functions can reduce the level of distraction but not eliminate it. So one of the themes that is coming out here is that better interface design can probably reduce distraction from some of these devices but not totally eliminate it. As you rightly said, portable devices now include a range of things that can be brought in, and except for the mobile phone we know little about their effects on performance. The Chair mentioned everyday activities. We know that eating a hamburger is as distracting as dialling on a mobile phone using voice commands — —

**Prof JOHNSTON** — But a cheese sandwich is all right!

**The CHAIR** — So we can have a pie, can we?

**Dr REGAN** — It depends on how big the hamburger is; I am not sure about the sandwich. We know that eating a hamburger can degrade lane-keeping performance and speed control. We do not know of any studies that have looked at the impact on driving performance of smoking, which is surprising.

**Mr LANGDON** — Smoking has been around for so long, and there has never been a study?

**Dr REGAN** — It surprises me. This is one of the things about distraction. The technology has caught our attention but not so much the every day activities.

**Mr LANGDON** — Dropping a lit cigarette on your lap is probably — —

**Mr BISHOP** — Fairly distracting!

**Mr LANGDON** — Not that I have ever done it. I do not smoke.

**Dr REGAN** — Of course we know from at least a couple of studies now that young drivers, especially those with young male passengers, exhibit particular types of driving behaviour. We think that is partly due to distraction and partly due to peer pressure. I will hand over to Kristie now for external sources of distraction.

**Ms YOUNG** — As Mike mentioned before, there are many different events and objects outside the vehicle that can distract drivers, but the research has tended to focus on advertising billboards and signs. We think this is because it is one source of external distraction that can be controlled. Obviously you cannot control the behaviour of other road users including emergency vehicles and things like that. So in terms of the effect of billboards and signs on driving behaviour, the research has tended to show that drivers spend a longer time glancing at moving billboards than they do at static billboards. On average they spend about 2 seconds looking at moving billboards which is above the recommended 1.5 seconds safe glance duration. Research has also found that looking at advertisements can distract drivers and impair their ability to detect hazards, particularly if the hazards are in their peripheral vision.

**Dr REGAN** — There is more information about that in the report. So overall, even though it is difficult to quantify the proportion of crashes in which distraction is a contributing factor because of differences in the way that data is collected, coded and analysed in those countries in which it is possible to determine the contribution of distraction, we can see that about 8.3 per cent of all crashes in one study were attributable to distraction as a contributing factor. In a recent New Zealand study the figure was 10 per cent, and up to 38 per cent of crashes in a

very significant study that was conducted recently in the United States of America, and for which the final results are not fully available.

I will just talk very briefly about that study because it is one in which they instrumented 100 cars with video cameras, sensors and other devices that allowed them to track 241 drivers, each of whom drove for over one year, accumulating about 2 million miles of driving data. It allowed them to determine for every near miss incident and crash, what caused the incident. The very significant thing is that they found that about 38 per cent of all incidents, crashes and near misses could be attributed to distraction, either as a primary factor or as a contributing factor. So that suggested in their study that distraction as a factor was even more prominent than other factors such as speeding, fatigue and drink-driving.

**Prof. JOHNSTON** — It also underlines how difficult it is to get meaningful distraction data out of the police reporting system, because people do not ever want to admit that they have been on a mobile phone or drinking a can of beer or whatever when the crash occurs. But when they do — and you can imagine the cost of that study — it has given us the first real handle on it. So the numbers obviously come to four times what you find in the police data.

**Dr REGAN** — Yes, they concluded from that study that distraction was more than twice the causal factor that they thought it was in the US based on the analysis of the crash data, so that was quite interesting. Then finally we have some data for some technologies and some everyday activities on their contribution to crashes and crash risk. We know that of all the distraction-related crashes, the radio and CD players account for anywhere between 6 and 12 per cent of those distraction-related crashes.

**The CHAIR** — Where did you get those figures from?

**Dr REGAN** — From a number of studies that we have cited in the report, one in New Zealand and three in the US, from memory. Passengers, we know, increase crash risk if there are two or more passengers and especially if the driver and passengers are young friends, by about four or five times. Smoking increases crash risk by around two times, and external distractions were found in one study to increase the crash rate after electronic billboards had been installed by around 35 per cent. So we do have some data already.

**Mr LANGDON** — You describe the billboards; there are several around. Some move fairly slowly and some move quite quickly. Is there any definition of which is the worst?

**Ms YOUNG** — There has not been any research looking at different speeds of billboards. It is interesting that a lot of the research on the billboards was back in the 1980s, and we have not been able to find any more recent data on the effects of billboards on crash risks.

**Prof. JOHNSTON** — We have a PhD student looking at that very topic at the moment. It is going to be another couple of years before we get any data out of that. But it is really a troubling one in the sense that the road authorities are under pressure to decrease their costs, so they want to take revenue from advertising. When you think about it, the advertisers only want to advertise where they are going to attract attention. By definition they want to grab your attention — that is, they want to distract the drivers. When you are looking at the road authority standards, road authorities attempt to address this but they do not really have the data to know what criteria to set: where to permit it, whether to have moving images, and if so at what change rate. They tend to have slow change rates on the grounds that if it only changes every, say, 3 seconds then a driver will never see more than one change as they have it in view. But all this stuff is in a sense seat of the pants — we do not know how to sort a lot of that out. It is the road environment equivalent of the vehicle design study.

**Mr LANGDON** — For example, having a moving sign on a freeway where you just go in one direction compared to the moving sign on the corner of Hoddle Street and Victoria Street, where you are trying to do right-hand turn, the degree of safety there is enormously different, I would have thought.

**Prof. JOHNSTON** — And what we do not know as well is whether in a situation like that if the traffic is really dense and lots of things are happening, you can shut the sign out. There is nothing in the psychological attention theory to suggest you might be able to shut it out. That is one of the things we want to try and investigate as well.

**The CHAIR** — So Monash University is doing that work at the present time?

**Prof. JOHNSTON** — We have a PhD student looking at some of those issues, but she is working at a fairly basic level at the minute. I am not pretending we will have an answer in the next little while.

**Mr STONEY** — It is quite ironic that some of the most eye-catching still ads are the TAC ads — you know, the ‘only a little bit over’ ones, or the ‘drink and drive’ one.

**Prof. JOHNSTON** — Yes, I worry about that.

**Mr STONEY** — Even that one with the three wise men — three fellows in a taxi — is a great ad, but it does catch your eye and you tend to look at it to work out what it means.

**Prof. JOHNSTON** — All roadside advertising by definition has to attract people. So if you think about distraction, you know you are doing the wrong thing. So yes, it is an issue.

**Mr LANGDON** — We will put that to the TAC.

**Dr REGAN** — This slide is telling us about that study I was telling you about where the 100 vehicles were fully instrumented — I am sorry that the figures are out of alignment — together, using wireless communication devices such as mobile phones and interacting with passengers, they were found to contribute to 34 per cent of all the distraction-related crashes that occurred. This is basically a slide that is telling you what the relative contribution of different sources of distraction were to the crashes. Unfortunately they did not say in the paper what the internal distractions and vehicle-related distractions were, but we suspect they related to things like entertainment systems and using devices other than portable devices that are brought into the vehicle. But we can say that out of that 34 per cent, about 30 per cent of the crashes were attributable to the mobile phones. So the mobile phone was by far the most significant wireless device contributing to crashes.

**Prof. JOHNSTON** — In the US, just to emphasise the point, there is no ban on handheld.

**Dr REGAN** — There is in some states but not others.

**Mr LANGDON** — Nine states, I think it was.

**Prof. JOHNSTON** — But in the state where the study was done?

**Dr REGAN** — I am not sure about that. I do not think there was a ban.

**Ms YOUNG** — I do not think so.

**Mr LANGDON** — We have asked about in what states the ban is on, whether they are densely populated states, smaller ones or whatever.

**Ms YOUNG** — We have a list in the back of the submission, appendix A, for all the US states that have got bans.

**Dr REGAN** — You can see that even things like personal hygiene, grooming yourself and what-have-you, dining, are all playing a part in this — —

**Prof. JOHNSTON** — That is not eating hamburgers. It is fine dining!

**Dr REGAN** — That is right. The factors that mediate the impact of distraction on performance are many and varied. There are lots of things that will determine whether you are going to succumb to the effects of distraction and by how much. One of them obviously is the amount of time that you are distracted for. This is a problem for younger drivers because they tend to be the ones who actively engage willingly in distracting activities, unlike older drivers who we find from research tend to what we call ‘self-regulate’. They tend to know that using a mobile phone is going to distract them and hence they do not use the things for long or at all.

Obviously human-machine interface design is important, as we have said. If the technologies are badly designed, they will distract you more. The task demand and complexity are important. A number of studies have shown that if you are engaged in a phone conversation that is emotional or if it is a particularly demanding conversation, you will be more distracted. Similarly studies have found that if the driving task itself is more demanding — for example, if you are in high-density traffic or if the weather is bad or driving is straight-out difficult you will be

more distracted by secondary activities. There is some evidence to show that practice can reduce the effects of distraction but not eliminate the distraction entirely, although that depends on whether it is a younger driver or experienced driver.

We know about young novice drivers aged 18 to 22 years and older drivers — in this particular study, those aged between 60 and 71 — are more vulnerable to the effects of mobile phone distractions. So we know that younger drivers who have less experience are more vulnerable to the effects of distraction. We know that there are some individuals who are better at resisting distraction than others — why that is so, we are not sure.

**Mr LANGDON** — Why do you think older drivers are more prone to distraction? They do not know how to use the mobile and they are fiddling more?

**Dr REGAN** — They are more vulnerable for a number of reasons. Firstly, they are less able as they get older to divide their attention such as between multiple activities. There is plenty of research to show that.

Their dwell times are longer. They typically need more time than younger people to extract the information they need from displays, and they are slower to respond once they have extracted that information in relation to the technology they are using. So all of those factors increase their propensity to crash. In fact what we can say is that relative to young people, older people are more vulnerable to the negative effects of distraction. It is just that because they, as I put it, self-regulate and tend not to use these technologies as much, they are not as effected by them as younger drivers. Some people of course underestimate or overestimate the risks associated with engaging in distracting activities. That creates a problem. If you do not think using a mobile phone is dangerous, you will use it quite regularly and it will be distracting.

The last term of reference we addressed was the suitability and enforceability of existing laws. I will spend about 5 minutes on that. In Australia we are doing very little relative to other developed countries to address the issue of driver distraction. There is very little regulation prohibiting the use of technologies we know are distracting and public education campaigns are scant and ad hoc compared to other countries — there is no doubt about that. In Japan, the US and Canada in particular they are very proactive in this area in letting the public know what is going on and in engaging actively with manufacturers.

Holden, however, has been proactive here in Australia in spearheading, along with MUARC, the setting up of a cooperative research centre for advanced automotive technology that among other things will be looking at human-machine interface design and driver distraction as an issue. So there will be scope within that project and we are involved in that at MUARC to look at some of the ergonomic factors at least that are relevant in this whole issue of driver distraction.

In terms of regulations there are two Victorian road rules, one dealing with banning the use of hand-held phones and one with viewing VDUs and TVs whilst driving, which we have talked about. There is an Australian design rule that basically says when you install VDUs and TVs in cars it should be in a location that cannot be seen by the driver whilst the vehicle is in motion. As I will talk about in a minute, there is state legislation that relates to careless and dangerous driving. Victorian road rule 300 basically bans the use of hand-held mobile phones except if the mobile phone is a CB radio, a two-way radio or if it is an emergency or police vehicle.

**Mr LANGDON** — Why is a two-way radio allowed and not a mobile?

**Dr REGAN** — I have no idea and that is why when Ian, Kristie and I were assessing — —

**Prof. JOHNSTON** — I think it has something to do with the politics of the introduction — because of the existing use of them by the industry, probably.

**Mr LANGDON** — But the distraction would be just the same.

**Prof. JOHNSTON** — We believe so.

**Mr STONEY** — The only thing about it is in the trucking industry and couriers they are professional drivers. If you drive for a living I think you would less likely to get into trouble using a CB than someone else.

**Prof. JOHNSTON** — I know anecdotally that taxi-drivers are looking for their next job, to see where the queues are while they are driving me around.

**Mr STONEY** — I was actually going to raise the issue of computers in taxis. So far we have not covered them; have you looked at that?

**Dr REGAN** — We will come to that. It is a good point. Ian, Kristie and I have talked about the suitability of this particular regulation and the comments we can make are firstly, it relates only to hand-held phones when we know that hands-free phones are just as dangerous. It sends the message to drivers that hands-free phones are relatively safe and we know they are not. The penalties for violating this particular regulation are lower than those for speeding and drink-driving at levels that pose comparable risk. So we believe that is an anomaly. It appears possible to use a hands-free phone under this legislation to send text messages, download videos and perform other activities as far as we can tell. There is nothing stopping anyone from doing that with a hands-free phone.

You have rightly raised the point about the exemption for CB radios and emergency vehicle drivers. We think that is questionable given that the driving demands for these people are extremely high, especially ambos who are driving at high speeds through intersections. We would have thought they would have been the last ones who should be using these particular hand-held devices while they are driving.

**Mr LANGDON** — You could also argue, and I know Graeme did, that they are professional drivers and are used to doing that, so there would be less risk. But I am sure a young person could argue that they are so used to sending text messages that they are less a risk as well.

**Dr REGAN** — It is an interesting point you make. We are doing some work for the State Transit Authority of NSW on buses. We had no idea how difficult it is to drive a bus until we did that job. The fact that they can use these CB radios and two-way hand-held radios while driving with one hand, operating a ticketing machine and being pestered by passengers is beyond understanding.

**Prof. JOHNSTON** — We have actually been investigating a couple of crashes that have occurred with mobile phone use by the driver of an STA bus.

**Dr REGAN** — The interesting thing about this particular road rule is that devices other than mobile phones can now be used for talking, texting and performing functions of mobile phones, but the regulation says nothing about those devices. It does not appear to prohibit the use of those devices. Even the term 'use of mobile phone' is not well defined. Does that just mean talking through the phone, texting or even putting an earpiece into your ear? There are some issues to consider there. In terms of enforceability the police tell us it is difficult to see drivers texting and drivers who hold tiny, little baby phones in their hands — they could just be scratching their ears and there is a phone in there. And it is difficult to apprehend drivers when they are travelling at high speeds in dense traffic. For them there is a safety angle as well as an enforcing that law.

**Prof. JOHNSTON** — I think what this is really saying is the legislation predated the increasing functionality of the devices and that is always going to be a problem because the technology is moving so quickly.

**The CHAIR** — The legislation is always going to be trying to catch up.

**Dr REGAN** — We have had a look also at Victorian Road Rule 299 which basically says you cannot be looking at essentially a DVD player while driving. Again there are exemptions here for VDUs in buses that display bus-related information, and if a VDU is a driver's aid, for example if it is a security camera or dispatch system, navigation system or even ticket machine in a bus. Apparently VicRoads provides some special exemptions.

Again, we think there are some issues here. Again the penalty for violating this rule is actually extremely low — I think it is only \$70 and one or two demerit points, I cannot remember but it is in the document, but it is very much lower than a hand-held phone violation. Potentially the distraction deriving from looking at one of these devices is greater than talking on a mobile phone.

**Mr LANGDON** — The police yesterday advised that they believed demerit points were more of an incentive to behave than fines. What is your opinion on that?

**Dr REGAN** — I am not sure how Ian and Kristie feel about it but from my perspective I think demerit points are probably more significant because even people who are rich and have a lot of these devices sitting in their cars — they are the ones who are more likely to have the devices in their cars — are going to be penalised. Probably a \$300 fine is not going to bother them too much quite frankly.

**Prof. JOHNSTON** — I do not think we know. The best data we have got is from speed-enforcement related research and we know there is a strong relationship between the issue of the traffic infringement notice and the subsequent crash record. But that gives you both a fine and demerit points, so we cannot separate it.

**The CHAIR** — In our country road toll inquiry we recommended that the government review the demerit points specifically in relation to handheld phones. It is committed to reviewing that early in 2006.

**Dr REGAN** — We do not know whether VDUs distract other drivers, as there is no data on this. We are not convinced that there is a need for that angle to be addressed in this legislation. Of course it pertains only to visual distraction.

DVDs can also potentially distract the driver but again there is no data on this issue. The exemptions for driver aids is questionable. Most of the aids listed such as dispatch systems in taxis and so on are likely to be extremely distracting — we know that when we hop into a taxi with a taxi driver they spend a lot of time looking at these devices. At a time when vehicle companies are developing what we call lock-out systems so that, for example, you cannot program a destination into a route navigation system while a car is in motion, there are no such systems in place for taxi dispatch systems.

Currently we do not know whether this rule applies to display screens on portable devices. So this regulation relates to video display units but now that a mobile phone can display moving video images, does it pertain to mobile phones? We do not know. There are quite a few loopholes in the technology for the reason that Ian said — technology is marching ahead of the legislation. Also, there is an exemption for what is called navigation intelligent highway and vehicle system equipment in this regulation. But there are all sorts of such services coming onto the market that can be provided on mobile phones and PDAs, and some of those may not be in the best interests of the driver to interact with while driving.

In terms of enforceability it is difficult for police to see that a display or video screen is illegally positioned, especially if people have the device positioned low down, and of course it is difficult for police to judge if a VDU screen is distracting other drivers. How can they make that judgment? If they can, I am not sure how they do it.

The next piece of legislation is ADR 42/04- part 18. Basically this says that you cannot install a visual display unit such that any part of the image on the screen is visible to the driver from where they normally sit. Again, there are exemptions, basically for so-called driver aids. It is a bit like road rule 299. They define driver aids as including satellite navigation, and some of these other systems that you can see on the road.

In terms of the suitability of that legislation, because it does impact on activities here in Victoria, there is a need to better define what devices are classed as driver aids. It is questionable as to whether all manufacturers will exercise their duty of care to disable distracting information as part of a driver's aid when the vehicle is in motion. At the moment there is no legal requirement for them to do so. It is just up to them to exercise that duty of care. For example, here in Victoria, drivers who bring a device into their car like a navigation system that they can buy from Harvey Norman, or a PDA or DVD player, are meant to install that device in accordance with this particular Australian design rule, but there is no-one in Victoria checking that they actually do that.

It should not be distracting, but no-one is checking to see that it is crashworthy, that it is fixed properly in a position that it will not injure them in the event of a crash. The only way in which we can get at this loophole is maybe through roadworthy inspections, but they do not get carried out regularly here in Victoria, as we know from data, and they are not cost effective. So a loophole exists. The only other legislation we are aware of that bears on your terms of reference is legislation relating to dangerous and careless driving. Sections 64 and 65 of the Road Safety Act relate to dangerous and careless driving respectively. Generally it seems that the police use section 65, which relates to careless driving, to sometimes apprehend people who they believe are driving in a distracted state, and they tell us that they charge about 300 drivers a month for careless driving due to being distracted, so that is actually quite a few more than we thought. But that has to go to the courts, and they told you yesterday, as they have told us, that if there was a traffic infringement notice that they could issue for distracted driving, then they probably would be more likely to apprehend more people for that misdemeanour than having to take them to court. They tell us that that involves more administration, and it can be hard work. Kristie Young will tell you about external distractions and what regulations and standards relate to them.

**Ms YOUNG** — Currently the guidelines and regulations for external distractions focus on the signage. VicRoads currently controls the placement of signs on freeways and arterial roads; and the placement of signs on

local roads is controlled by the local councils. We think this is questionable because different councils might have different guidelines for placement and design of signs. They may erect potentially distracting signs. VicRoads also has guidelines to assess the suitability of distraction potential for proposed signs. This does not have any legal standing so it is possible that the decision on a particular sign may be overruled. And finally, there is no standard law that regulates the roadside. It varies from state to state and what is deemed acceptable varies across jurisdictions.

**Mr STONEY** — I did not know that. So if a couple have a bed and breakfast somewhere, and they put up a big sign on a VicRoads road, inside their property but on a VicRoads controlled road, and VicRoads says they must pull that down, they legally cannot force the people to pull it down. Is that right?

**Ms YOUNG** — I think VicRoads then does have the right to ask them to take it down.

**Prof. JOHNSTON** — I think under the Road Management Act, VicRoads does have the right, but I think the bed and breakfast would then be able to appeal, probably to the — —

**Mr STONEY** — If it is their property but it is up against the highway, you are saying the billboard guidelines have no legal standing?

**Ms YOUNG** — For local roads, and if they are 60 metres back from the road.

**Prof. JOHNSTON** — If it is far enough back, then VicRoads would generally have no control.

**Dr REGAN** — That concludes probably 90 per cent of our talk. For the last 10 per cent of the time we would like to turn to what we consider are appropriate recommendations from a safety point of view.

**The CHAIR** — Just before we get on to the legislation, you mentioned before that there are other countries such as Japan, United States, and Canada that are far more active than us in relation to this subject. Do countries such as those and any others have effective laws that we should be taking into consideration?

**Dr REGAN** — Some countries ban both handheld and hands-free phones. I think they are listed in the appendix there. We know that some countries have more regulation than we do with regard to the requirement for vehicle manufacturers to design their cars more ergonomically. Canada is a pretty good example of that. Rather than increasing regulation, Transport Canada is entering into a memorandum of understanding with the automotive industry to ensure that the manufacturer exercises its duty of care to design vehicles such that ergonomic factors become part of the quality process in vehicle design.

**Prof. JOHNSTON** — But you have pick up the telecommunications industry as well, because so much of this stuff now is imported into the vehicle not built as part of it. That has to be the way we go. We have to get the onus onto the manufacturers of those devices and the vehicles to establish that they are not creating difficulties.

**Mr LANGDON** — You have mentioned various countries, but you have not mentioned anyone from Europe. Is Europe doing anything on this? Are they being proactive?

**Dr REGAN** — That is a really interesting example, and I am glad you have raised it. They are doing a lot of research in the area of driver distraction, but they have been less proactive in making regulations and in taking initiatives than North America, Canada and Japan. I think it is partly due to the fact that there is a such a disparate conglomeration of member countries that it is very difficult to get any consensus across the European Union as to what the harmonised approach ought to be to take. Some countries have been a little more proactive than others, such as the United Kingdom, but it is an eclectic mix in Europe.

**The CHAIR** — So going back to the ban on mobile phones, any mobile phones, there are countries that have a blanket ban on the use of mobile phones, whether hands-free or not?

**Dr REGAN** — Yes, and in the United States at least one or two states have a blanket ban on the use of both kinds of phones for probationary drivers. I think it might have been Wisconsin?

**Ms YOUNG** — Connecticut. There are also a couple of states that ban all phone use for school bus drivers.

**The CHAIR** — Are there statistics to show the effectiveness of those types of bans?

**Dr REGAN** — Yes, in Japan they did a before and after study, and the data is in the report. I think it showed a 50 per cent reduction in the number of people who were using hand-held phones since they introduced the regulation, and I think in Japan because the people are more compliant than drivers in some other countries that went up a little after the ban came in, but it has stabilised. There is New York as well, I think.

**Ms YOUNG** — Yes, New York and the UK have also done studies and found similar results, about 50 per cent.

**Prof. JOHNSTON** — But it is not crash data yet; it is just the impact on the use.

**Ms YOUNG** — No, it is all just observational.

**Prof. JOHNSTON** — So that is all heading in the right direction. How it translates to crashes is what we do not know.

**The CHAIR** — So New York has a ban on what?

**Ms YOUNG** — A ban on hand-held phones only.

**The CHAIR** — Not on hands-free?

**Ms YOUNG** — No.

**Dr REGAN** — Those are the only two jurisdictions we know of that have tried to quantify the impact of having a ban on hand-held mobile phones. We have not even done that ourselves in Victoria as far as I know.

**The CHAIR** — So are there jurisdictions that have bans on hands-free phones?

**Dr REGAN** — Yes, as we said for particular driver groups. That seems to be the approach they have taken and it is the approach the three of us would recommend in our summing up of recommendations. Because we work at MUARC we thought about the recommendations from a systematic point of view — what would be an integrated package of recommendations that could be made for dealing with distraction as an issue. There does not exist another document anywhere in the world that we know of that has tried to package together distractions as an issue, so we have the potential to be the first jurisdiction.

**Prof. JOHNSTON** — We would have put the recommendation for research at the top of the list, but we thought we had better not!

**Dr REGAN** — I wanted it to be on the top but he would not let me!

**The CHAIR** — Keep the best to last.

**Dr REGAN** — That is right. Data collection is very important. Ultimately we need better designed police report forms that contain successive categories that enable us to determine what distractions impacted on the crash or near miss. In the interim, as Ian suggested, we are recommending a pilot study be undertaken to collect better data for a sample of police-reported crashes. Our initial discussions with police about this seems quite positive, so I think they would be in it. We believe we need, as with other issues like speed, drink-driving and that sort of thing, to conduct regular exposure surveys to find out what technologies people are using, how often and under what conditions, to get a handle on the frequency of distracting activities and for what duration they have engaged in them. That is the only thing that allows you to determine the level of risk that these systems and activities impose on drivers.

**The CHAIR** — How are our police forms compared with those of other states?

**Dr REGAN** — I think they are worse than those in some other states. New South Wales collects more distraction-related data than we do in Victoria, and I am not sure about the other jurisdictions.

**Prof. JOHNSTON** — But we do not know about the quality of the data yet. The other thing is that most people will not tell the police they are doing something they should not be doing. One of the things we found with

other work is that if we interview people in hospital in the context of a research study they will tell us stuff that they will not tell the police. It may be that between the second one, which is getting the police to gather extra stuff, and the hospital-based study where we are talking with crash victims in a non-enforcement context, we will get a pretty good handle on it.

**Dr REGAN** — That is exactly right. Finally, there are the so-called data event recorders that are now fitted to a lot of production vehicles and that are capable of collecting a lot of information about what is going on within the vehicle. They could be modified to include a collection of information about driver interactions with controls within the vehicle and other systems that could give us a handle on what is going on within the vehicle.

**Mr STONEY** — What is the legal position on accessing that vehicle information?

**Dr REGAN** — I am sorry, I cannot tell you what the privacy laws are.

**Prof. JOHNSTON** — I think the manufacturers are able to download the stuff for their own use, but they are never able to tie it back to an individual. They can do it in aggregate. The privacy issues would be difficult to overcome.

**Dr REGAN** — I cannot stress how important it is to mount a public education campaign that debunks the myths such as hands-free phones are safe or it is okay to text. We need to tell people what are the relevant dangers associated with certain activities; because most people would not realise that even tuning a radio is dangerous. We need to make people aware of the factors that increase their vulnerability to risk, to give them basic information on how to cope with distraction when there is no way of avoiding it, and also to make them aware of existing and revised penalties. We feel the campaign should focus in the first instance mainly on text messaging, hands-free conversations and young novice drivers.

The training system that we have in Victoria is very well geared to enable distraction as an issue to be incorporated within training programs. We need to decide through some careful thinking when and how to expose drivers to distraction in a graduated licensing system; there is no guidance on that at all at the moment. A parent would not know when it is appropriate for parents to be with them, when to let them use a mobile phone, when to let them start tuning a radio — absolutely no guidance at all. We need to train them in how to limit and cope with distraction. Given that there are multiple ways of tuning a radio and interacting with different systems in different vehicles they need to know what is the optimum way of doing so to limit distraction. At the moment the car dealer is not telling them that and the driving instructor is not telling them that. Someone needs to be giving them that training.

Drivers need to be self-aware of the effect of distractions. As I said, one of the insidious things about distraction is that it interrupts your feedback loops, so while you are being distracted you do not know that it is affecting your driving behaviour. We need to develop it thorough training techniques that make them aware of the effects. We need to calibrate them so that they know whether they are capable of dealing with distracting activities.

Finally, research we are doing at MUARC is looking at team training for passengers and drivers. The predominant paradigm in driver training around the world has been to train the driver, but we know passengers have an enormous influence on the behaviour of the driver and hence their safety. So we are using techniques drawing on the aviation industry to train passengers as well as drivers to be responsible for their safety in the vehicle. That could include training that deals with how the passenger can behave as a co-pilot to take over some of those distracting activities that a driver might otherwise perform.

**The CHAIR** — Just with issues such as programs, has there been any type of study in relation to the effectiveness of the mounts on the steering wheel?

**Dr REGAN** — You mean steering control of system functions?

**The CHAIR** — Yes.

**Dr REGAN** — There have been some studies, but they are very hard to get hold of because most of them are done by car companies and they keep that as privileged information. I do not know whether Ian or Kristie have seen anything, but I will be honest: even within the open literature there is really not much. It is an area that deserves some research.

**Prof. JOHNSTON** — From first principles in an ergonomic sense anything you can do that will enable them to do it without taking their eyes off the road, which is only one of the forms of distraction, as Michael said right at the beginning. In a design sense it is a step in the right direction in principle; we do not know the effect in practice.

**Dr REGAN** — That is right. We have talked about the legislative stuff already and so the recommendations we can make are that there is a need to review current legislation, in particular in relation to those exemptions and loopholes that we said existed. We have talked about our perceived need to review current penalties, to review current definitions — for example, what is a visual display unit? Is it just one that sits in a DVD player, or does it include mobile phones? We believe P-platers ought be banned from using all mobile phones including hands-free phones for the whole of their P period and also their learner period. We cannot see why that ban should only apply for the first year of driving, because we know that even for experienced drivers there is a fourfold increase in the risk of having a crash when they interrelate with a hands-free phone. We know that a P-plater is still learning a lot of activities well beyond the expiration of the Probationary period.

We believe passenger restrictions are appropriate for P-platers for at least part of the P period. We believe there should be a ban on CB radios and handheld two-way radios immediately because their use cannot be justified on road safety grounds, and they are typically used by people who are at greater risk in driving at high speed and in dangerous conditions. We believe there should be a ban on devices, and that includes mobile phones and other items which are distracting, like PDAs — personal digital assistants — BlackBerries and those sorts of things. As we said before, there should be an approval process for checking the fitting of after-market devices that are put into vehicles which may not be installed in a manner that is consistent with ADR 42/04. We are not sure what that process would entail, but it is important. Ultimately we believe there should be a ban on all mobile phones used by all drivers. A number of companies around Melbourne have banned the use of mobile phones when driving, including MUARC, because Ian has brought in a policy that does not allow any of us to use mobile phones at all when we are driving. We have not done the research properly, but certainly my personal mobile phone bill has gone down. I tend to use my phone when I go for my lunchtime walk.

**The CHAIR** — Why do you say that.

**Dr REGAN** — For two reasons. Firstly, we feel that if, like we always do in Victoria, we take a graduated sort of approach to this and eventually ban it for P-platers, and if we make the public aware that quite a number of companies have already banned them as a duty of care to their employees, and if we do a little more research along the lines that we suggest within this package of recommendations it would make it easier also to enforce a ban. At the moment we are not convinced that it is totally possible to properly enforce a ban on hands-free mobile phones. Although we know it is probably possible to ban the use of hand-held phones, we know that 30 per cent of people are still using them. That does not mean that you do not enforce the ban. If you enforce the ban it sends the right message to people that it is dangerous, and eventually through all the things we have talked about here, and the mechanisms we know will take place, you will have better user acceptance and it will be easier to enforce it because drivers will do it voluntarily.

**Prof JOHNSTON** — If it was not for the enforcement issue we would be able to go the whole way. It is just as difficult to enforce with one subset.

**Mr STONEY** — May I just make a comment on this? I wish my colleague Barry Bishop was here because he would have driven a grain truck and would have been constantly on his CB radio to the harvester. It appears that you have really made a broad-brush group of recommendations right across the state. You can apply it to Melbourne, but these days a CB radio is necessary for safety in bush and desert situations. During the grain harvest and the wine harvest, trucks and harvesters are coming and going; a CB radio is important for commerce. It is important for road conditions for professional truck drivers out on the highways and outside Melbourne. It is part of the whole way that commerce, and indeed recreation, works outside of the metropolitan area and there does not appear in your recommendations to be any allowance or acknowledgment of that. So I really need to put on the record that I think it is far too mandatory for the whole of Victoria or Australia. It might well be that it has some merit on busy roads and in greater Melbourne, but I think you should look at the wider issues and the needs of commerce and the needs of safety.

**Dr REGAN** — I suppose I am only speaking on behalf of Ian, Kristie and myself, but because we are not politicians we felt that it was not something we should be talking too much about because you would be making those decisions.

**Mr STONEY** — I will take you up on that point. Surely there is a difference between using a CB radio on the Western Ring Road and on the Hume Highway outside of Melbourne. There is a vast difference in those two operations. Yet there is no acknowledgment that traffic conditions, density of traffic or the geography of where the user is is a consideration. For example, you identified that radios and CDs can cause accidents, but there is nothing at all to say that they might assist in fatigue when you are driving 7 or 8 hours straight. So you really need to balance what you are saying. If there was a debate about fiddling with a radio or a CD against perhaps the benefits of combating fatigue, which I know it does, the use of the radio would come out on top. But in your report it does not say this or that, so I need to record that.

**Mr LANGDON** — But you could also say the same thing about mobile phones if you driving for too long. A mobile phone would have the same benefit against fatigue, and using a mobile phone on the Hume Highway is less dangerous than a mobile phone on the Western Ring Road.

**Mr STONEY** — Yes. I think that is exactly what I am saying. I would agree with that. You should just be driving on the Western Ring Road, but on the Hume Highway outside Craigieburn it is a totally different scenario.

**Dr REGAN** — I appreciate what you are saying. It is a bit like seatbelts; we have compulsory seatbelt wearing. For a couple of years I worked in the road safety department of VicRoads and lots of people were given exemptions from wearing a seatbelt for various reasons. I suppose the exemption process, even though it is one you do not want to abuse because it creates a lot of administration and what have you, is another mechanism by which people who feel they have a right to use these devices can apply to use them.

The other issue you raised is an important one. There is little research that has been done as far as I know to look at this link between fatigue and the use of devices that deliberately distract you to keep you vigilant. I do not know if anyone has looked at the cost benefits of that issue in particular in determining whether to ban the devices. I suspect the issue is there is probably a minority of people within society who are using those devices to do that — they would be mainly commercial vehicle drivers. You would have to ask why they are doing that in the first place: should they really be driving in a fatigued state in the first place and then using these devices to keep them vigilant? There are all sorts of thorny issues in that one. There has been some research which has attempted to quantify the benefits and costs associated with introducing a ban on the use of mobile phones; we reviewed that literature in this report. In the end I think it worked out that it is sort of cost neutral from an economic perspective — the advantages you get in implementing the ban from a safety point of view would be about the same as the cost of the disadvantages you get in banning it in terms of loss of productivity and some of the issues you alluded to. It is a very good area, but it is a complicated one.

**Prof. JOHNSTON** — Can I just make a comment on the exemption? There clearly is a case for some exemptions for some circumstances, but we still know this stuff is distracting. The trouble with the existing legislation is these are blanket exemptions — if you have a CB radio, you can do what you like with it. Another way to approach exemptions is to make them time based. We then have to ask what is the need of, say, the grain operator and what is the best way of meeting that need in a non-distracting way. You then have a time-based exemption which gives the industry the breathing space to come up with another technology. Technology is moving so quickly I think it will be possible to meet the need in a less distracting way. That is the approach I would like to see taken. I think that was done with, as Michael said, the seatbelt stuff. Initially the rate of belt-wearing by truck drivers was very low. A lot of that had to do with the fact that the belt was very uncomfortable. It was anchored to the pan rather than to the seat and the seat was designed to move around. Once the belt become redesigned and was integrated into the seat, you got an increase in belt-wearing. You need to think about not just providing the exemption but more providing a motivation to meet the need in a way that overcomes the problem as well.

I think we have to do that with the taxidrivers as well. Truck drivers are one group, but I think we have a real issue with that. We do not have the crash data unfortunately, but we know anecdotally that they are all looking for their next job. It is really quite simple to modify the technology so they can only ever access what the taxi queue is at Tullamarine when they are stationary, say, at a red light, but they cannot access it when they are moving. It is a

very simple technological fix. We do not want to take away from them the functionality of being able to look for their next job, but you can control when they get to do it.

**The CHAIR** — I am not too sure how far you are into your presentation.

**Dr REGAN** — Just about to finish actually, probably 2 or 3 minutes away.

**The CHAIR** — Fine.

**Dr REGAN** — I think it is self-explanatory what we feel is appropriate to do in relation to enforcement so I will not read through that.

**The CHAIR** — Just in relation to technology, is there technology around which would assist police in enforcing mobile phone bans for example?

**Dr REGAN** — It is an interesting one. We know that if you take your mobile phone into a cinema, its reception can be blocked. Presumably there are means by which, let us say above a certain speed, the reception could be blocked through technology. No-one has actually explored the options, or if they have been explored they have not been publicly revealed by the telcos.

**Prof. JOHNSTON** — To me the fix is technological enforcement, not police enforcement, which is what we are talking about now. I think that is quite feasible.

**The CHAIR** — So we do not know whether that technology exists at the present time.

**Dr REGAN** — We do not, but I suspect it does. I do a lot of work in intelligent transport systems and I would probably say with 90 per cent confidence that I think it could be done.

**The CHAIR** — We have machinery roaming around on Mars so I guess it is viable.

**Prof. JOHNSTON** — I think the motivation to do it has not existed, but I think as soon as it did — —

**Dr REGAN** — Exactly.

**Prof. JOHNSTON** — It would appear very quickly.

**Dr REGAN** — We have talked about vehicle design and we believe the main thing is to develop a memorandum of understanding, as Transport Canada has done, with, as Ian rightly says, the automotive industry and other relevant industries and telcos so basically products are designed ergonomically and we have the right procedures for testing that the systems are minimally distracting before they go on the market.

In terms of road design, we need to document what are the distracters. We need to conduct surveys of driver exposure to these distractions. We need to start getting the vehicle manufacturers to talk to the traffic authorities. Professor Claes Tingvall, when he was out from Sweden recently, pointed out to me that vehicle manufacturers have developed systems on cars in Europe that have cameras that are reading the markings on the road and using that information to provide a warning to the driver if they drive off the road, but the manufacturers have not spoken to the road designers to ascertain whether the road markings are in a fit enough form for that system to work properly. You are not having this direct dialogue going on. It needs to go on so that information that is presented inside the vehicle which is currently presented on road signs outside the vehicle is compatible with stuff on road signs.

The road safety audit process should include an audit of ergonomic factors that may be relevant to distraction. When you do the road safety audit you should be picking up things in the road environment that are potential distracters. We need to be providing guidance to local councils and advertising companies on how to design roadside advertising in a way that is going to be compatible with driver's needs, but also taking into account Ian's comment that most of these signs are deliberately designed to distract people. We have talked about the review process already.

Fleet managers buy most of the new cars in Australia and they have a duty of care to provide a safe working environment for their drivers. We can see that they can provide a very powerful role as a role model in managing

distraction and hence changing community attitudes to driver interaction with distracting devices and activities. We believe these are the things that can be done by governments to make that happen.

The licensing system is a very powerful tool through which we can be dealing with distraction. The current handbooks for learner drivers to allow them to get an L-plate contain almost nothing about the relative risks of distraction. There is nothing that I can tell in the knowledge tests that relates to testing knowledge about distraction and how to cope with it. As far as I know, driving instructors and VicRoads service providers are not directly testing for people's ability to deal with distraction and to pick up on their awareness of distraction and to determine whether they are properly self-regulating when they are distracted. The graduated licensing system, as I said before, needs to gradually expose people to distracting activities, especially ones they have control over.

As you said, leaving the best to last, we believe there is a lot of research that can be done, which we have documented in our submission. In conclusion we believe distraction causes crashes and probably always has, but the frequency is increasing as we add new sources of distraction to the driving task inside and outside. We have talked about the options for managing the issue. For us we believe these are the highest priority issues. I will not go through all of those issues because these are just a subset of the recommendations I have just run through, but we believe there are some priorities that relate to the driver, the vehicle and the road environment that could be pursued. Ian and Kristie, did you have anything else to say? That is our presentation.

**The CHAIR** — Thank you, Mike; that was tremendous. Thank you Ian, Kristie and especially you, Michael, for the presentation. We will take all that on board, of course. We got the report from you only late last week, so we would like to go through that and reconvene and have some more of your time.

**Prof. JOHNSTON** — We would be more than happy to come back and answer any specific questions — verbally, in writing, or whatever.

**The CHAIR** — Thank you very much for that; we appreciate it.

**Witnesses withdrew.**