

ROAD SAFETY COMMITTEE

Inquiry into Pedestrian Safety

Melbourne — 19 April 2006

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Mr Bruce Corben, Senior Research Fellow; and

Dr Jennifer Oxley, Senior Research Fellow, Monash University Accident Research Centre.

The CHAIR — The committee welcomes Jennifer Oxley and Bruce Corben from the Monash University Accident Research Centre (MUARC). We appreciate MUARC's input to the committee over many years, and we appreciate your time, efforts and contribution to our committee this afternoon. As you are aware, the committee is looking at the pedestrian safety inquiry that was tabled in Parliament in 1999. We are reviewing the outcomes of that report from that time. I note you have a presentation, so again we thank you for coming along, and I will hand it over to you.

Mr CORBEN — Thank you very much, ladies and gentlemen, for the chance to appear and present. We have put together a presentation that might take us 15 or 20 minutes or so to go through, but we are very happy for people to interrupt for discussion and questions and so on at any stage. The views that we will be presenting represent views that have been formed over a period of well over a decade of research that both Jenny and I and our colleagues at MUARC have been involved in in the pedestrian safety area and a lot of the practical programs of pedestrian safety as well. We will be drawing on a history of work in that area.

Overheads shown.

Mr CORBEN — The first thing I would like to do is to put in perspective the importance of walking. It has always been talked about in this context of pedestrian safety, but there are a few key points. It is the original and fundamental form of human transport. It is something that we are all encouraged to engage in for reasons of good health. It provides us with the opportunity, particularly for young people, for personal independence, social connection and all of those sorts of things that help to make for better societies. It is inexpensive, flexible and in many ways it is regarded as a socially responsible form of transport in that it does not pollute. It does not threaten others in the same way that other forms of transport do. Generally speaking, it is something that is carried out at low cost.

With all of those and other benefits, it is an activity that is vigorously promoted by various agencies of government for a whole host of reasons of health, environment, travel demand management — all of those sorts of things. There are great benefits but, given that it is being heavily promoted, it is our view that it should also be made safer than what we currently have.

We wanted to present and discuss with you three main issues. A first one is about speed. The second issue is about road infrastructure that might be appropriate to support moderate speeds in pedestrian environments in order to create low-risk walking. The third issue is to talk a little bit about the Safe System road safety philosophy. I am not sure how much people know about that, but we will talk about that and where that fairly major shift in thinking might take us in the future.

Dealing firstly with speed, from our own research and from the research of others, the evidence is very strong — indeed, it is compelling — that it is probably the single most important issue for pedestrians in terms of their safety. I think it is captured very well by a quote from Spolander, a Swedish road safety expert, who said:

The safety level is determined by the speed level. Other countermeasures are only fine tuning.

That tends to capture, in my mind, the essence of the importance of speed.

To try and illustrate or provide some evidence to support those couple of statements about speed, if we look back over the last quarter of a century or so at pedestrian deaths in Victoria, from 1980 until just last year, you can see probably three main areas of safety performance for pedestrians. During the period of the 1980s, the average number of pedestrian fatalities, with its ups and downs, was generally somewhere around the 140 to 150 mark. Then in 1990 — you can see that area on the graph that has been marked — there is a step downwards to a level which, again, for the next decade or so, settled around 80 or so fatalities per annum. So there was a whole new level - a step downwards that was then maintained for the next decade.

In 1990, as I am sure you are aware, speed cameras were introduced to Victoria and there was also a strengthening of random breath testing, so we saw a major drop that was then sustained for the next decade. There is then no major change; there was a gradual downward trend. But in 2002 there was another change in speed initiatives within Victoria. That is when Victoria Police announced that there would be a tightening of the enforcement tolerance and compliance with speed limits across Victoria.

Again you will see the evidence of another marked step downwards to a new level which, for the last few years, has been down around 50 fatalities or below — between 40 and 50. Whilst we have seen very desirable gains over that quarter of a century, the timing and the effects seem only to be able to be explained by the major speed initiatives that were undertaken across Victoria on those two occasions. It seems that those new levels have been maintained as a result.

Mr MULDER — When were the 50-kilometre-an-hour speed zones introduced?

Mr CORBEN — I think that was in January 2001.

Dr OXLEY — So it could be a combination of the tightening of the tolerance levels, plus the introduction of the 50-kilometre-an-hour speed zones.

Mr MULDER — In relation to the tightening of the tolerance levels, as I understand it, prior to November 2002 it was announced that speed tolerances would be reduced down to 3 kilometres an hour, not by 3 kilometres an hour. Is that what you understood the announcement to be?

Mr CORBEN — I think the announcement was of that nature. I do not recall the actual details, but I think there was mention of the 3 kilometres an hour. I do not remember mention of any other tolerance allowance above that. I think the public was probably under the impression that it was sharply reduced.

The CHAIR — That is interesting, particularly if you combine that graph with the graph that VicRoads presented to us an hour ago, which showed that the mean average speed of cars between 1999 and 2005 in 60k zones had dropped from — I think it was 64 down to 58, or something like that. Actually we asked a question about combining that with his graph here, so there is a correlation between the two graphs

Mr CORBEN — Yes, it seems to be supported by what we know about speeds across the system. Just to continue on the issue of speed, I am not sure whether you have seen these sorts of plots before, but it reflects some work we have been doing for the Transport Accident Commission over recent years where we have simply been using the laws of physics to plot the relationship between the initial speed of a driver and the distance when drivers are required to react or come to a stop in relation to some event that happens ahead.

A couple of very important points come out of this. The reason I go back to basics on this is that we so often hear in everyday contact with people that they do not really understand the Wipe Off 5 message that the TAC has been promoting, and these relationships are pretty much at the heart of that message. You can see on the horizontal axis how the stopping distance increases — not linearly with the speed but according to the square of the speed; I have actually plotted initial speeds of 30, 40, 50, 60 — in 10 kilometre increments, then 65 and then 70. Generally speaking the stopping distance increases in relation to the square of speed rather than linearly with speed, which is one of the difficulties the general public has in understanding the true relationship between speed and stopping distance.

More importantly, when you look at two speeds, taking the TAC comparison of 60 km/h and 65 — that is the pink line at 65 and then the darker one below it — you can see that when the 60 km/h driver has come to a stop, the driver of the vehicle travelling at initially at 65 km/h is still

travelling at something over 30 km/h, notwithstanding that 5 km/h difference initially. That is simply the way the laws of physics work out.

Mr MULDER — Do you have any data in relation to pedestrian accidents that have braking patterns and braking times? Are people getting hit by vehicles that are not braking, or just braking, or just showing 10 or 20 metres of braking? How does that tie in? Have you any of that historical data from the police at all?

Mr CORBEN — Yes. The best source of evidence that I know of comes from the work of Jack McLean at the University of Adelaide, who has conducted research into pedestrian crashes over a number of years. One of his main findings was that about half of all pedestrians who are killed are struck at the travel speed — in other words, no opportunity

Mr MULDER — No braking?

Mr CORBEN — No braking by the driver, so that is in about half of cases. That is another reason why travel speed, speed limits, is such an important issue for pedestrian safety.

If we think about those differences between speeds for a vehicle that has come to a stop compared with the one that is travelling at a higher speed and then relate that to this curve — again, I am not sure that people have seen this particular relationship — it shows from a number of sources of research around the world the relationship between, on the vertical axis, the risk of a pedestrian dying in a crash, and the impact speed. You can see the white curve shows that at around 35 to 40 km/h for all aged pedestrians, but pedestrians in general, there is a very steep increase in risk above that point, above 35 to 40 km/h.

Given the point that I was making just a moment ago in response to your question, Terry, that approximately half the pedestrians who are killed are actually struck at the travel speed, then it is important that travel speeds are not much higher than down around that range in pedestrian environments. Once the impact speed gets above 40, there is a 25 per cent risk of death from these data, and then the risk starts to climb dramatically with increasing speed.

Mr MULDER — Does MUARC have any data on infringements against pedestrians? I made a comment before to VicRoads that I note, coming from the country to Melbourne, a lot of people completely and totally disobey the red lights at intersections in Melbourne; they just walk straight through.

Mr CORBEN — Pedestrians disobeying?

Mr MULDER — Pedestrians who just walk straight through. Is there any data on the level of infringement that occurs with pedestrians — enforcement details?

Mr CORBEN — Yes, there would be. There is evidence from a couple of sources at least. One would be simply from crash investigations by police, where you can determine with a reasonable level of confidence that pedestrians are crossing against the red signal, and that is a reasonably common point.

Mr MULDER — But even now — enforcement as it stands now?

Mr CORBEN — In terms of enforcement, no.

Mr MULDER — I do not see any at all in terms of pedestrians breaking the road laws. I see plenty of enforcement in relation to motorists breaking the road laws, but little or nothing in relation to pedestrians.

Mr CORBEN — I cannot point you to anything in terms of that.

The CHAIR — The police would have stats on that.

Mr MULDER — Yes, but I just thought that as part of your research you may have looked at that in the past, but no.

Mr CORBEN — No. I think there is a relatively low level of active enforcement of that type.

A second point to make about this particular relationship is that we have drawn a second curve on there, which is the one shifted a bit to the left, which is to indicate, not necessarily precisely, the direction in which risk moves for older and young pedestrians and those who are in some way more vulnerable than pedestrians in general. While for the general category of pedestrians 35 to 40 seems to be the point where risk takes off quite rapidly, it is much lower we believe for older people and for children.

Moving on to the second of the three points we want to present — that is to talk a little about road infrastructure that might be appropriate to support moderate speeds in pedestrian environments, thereby leading to low-risk walking. One of the recommendations we would make or support is to see an expansion of the current trial of the part-time 40 km/h speed limits in shopping strips. That has been in place now for some years, I am not exactly sure how long — two or three years, perhaps. I think something in the order of 15 to 20 shopping strips in metropolitan Melbourne have that type of speed limit control; but the majority of shopping strips where these pedestrian crashes tend to happen or tend to cluster are largely untreated, so an extension or expansion of that type of trial, would be beneficial.

I think a proviso or a strong recommendation would be that it is important to have high-standard signing in order that drivers entering those shopping strips are quite clear about what the speed limit is, and that is not always the case, currently.

Mr MULDER — Do you have any results in relation to the trials that have been conducted up to date? Is there any evidence to support that it is working or that there is compliance.

Mr CORBEN — I would like to be able to answer that but we have not been asked to investigate that. We would be hopeful that VicRoads might commission some research in the future on that area, but at the moment we do not know.

Another example of some infrastructure that we have been involved in evaluating is in the city of Port Philip. Although it is only one intersection and it will not make a big impact across the network of course, but it is an example of how you can design and operate intersections in pedestrian environments to bring about much lower risk. This intersection, or roundabout, had been in place for some time. It is beside the South Melbourne market.

The City of Port Philip decided it would be desirable to reconstruct the roundabout so that specific provision was made for pedestrian movements around the intersection. Currently the road rules do not allow for any right of way for pedestrians at roundabouts. Vehicles have right of way — turning vehicles, straight-through vehicles — so unless particular provisions are made, pedestrians are pretty much on their own in terms of crossing manoeuvres. The particular advantage we get from roundabouts is that they do bring speeds down to a much lower level than if normal signals or signing were in place.

The City of Port Phillip has added to those safety benefits by constructing raised crosswalks for pedestrians and also zebra crossings, so that pedestrians now have right of way when they want to cross, which they did not previously, and they have vehicles approaching at much lower speeds than they previously did because of the raised hump on which the crosswalk is built.

We did an evaluation — and I will talk a little bit about this in a moment — of this in terms of changes in speed behaviour and the perceptions of pedestrians in relation to this new design. The

results are pretty positive. I will give a very brief summary shortly. That is an example of how intersection operation can be modified to create much lower risk environments for pedestrians.

The CHAIR — Bruce, just on pedestrian crossings, have you done evaluations of all pedestrian crossings or just ones at intersections? I suppose the other way I could ask the question is, what is the safest pedestrian crossing?

Mr CORBEN — I do not know if we can actually answer that with research evidence, but my feeling is that the safest pedestrian crossings are those where the speed of vehicles is brought down to a moderate level, and so decision making between drivers and pedestrians is conducted in a more timely way. If things then do go wrong, then the consequences will be a lot less severe. I guess that is the principle that we have tried to work with in many ways.

Mr MULDER — I am from the country and there are a lot of roads in my area where I have had requests — one through Winchelsea and another one down near Timboon — from the community asking for pedestrian crossings. In Winchelsea it has been at the Princes Highway. Whether or not VicRoads act depends on traffic volumes and not on how dangerous that section of road is for a pedestrian. Have you looked at that in any way, shape or form with any of the research you have conducted in terms of what should determine where an effective pedestrian crossing should go?

Mr CORBEN — We have not conducted any research on the way in which pedestrian crossings are either approved or not, but I guess I have looked at that myself through my PhD thesis which I am doing in this area and have almost completed. There are some real concerns about the way in which the warrants operate, they do not take strong account of the level of risk, but rather the numbers of people and the numbers of vehicles which might be using a location so that there is some sort of priority. Personally, I think there are some shortcomings with the way the warrants are developed and applied.

Mr BISHOP — Does there not need to be a balance between the intrusion on traffic against the safety of pedestrians? I would have thought that the safest pedestrian crossing is one that has a red light on it, and orange and green; that should give them total safety. Then you go to the one you are looking at there of which there are a number in the area where I live for a start, they have been there for years. Then there is just crossing the road without any protection at all. When people do that, do they study the traffic flow? If you wanted it totally safe, you would have everybody driving at 10 km/h and there would be lights on every corner; but that is uneconomic. Who does the study between where it comes out as a balance? You guys do not.

Mr CORBEN — No, we do not. I guess that is where VicRoads, in particular, but local government as well would play a part in determining what kind of balance and where the point of balance ought to be.

Dr OXLEY — I guess you have to look at the type of road environment to figure out which type of facility is most appropriate. If you are looking at a higher volume road with faster speeds, I guess you would want to go with red lights. But if you are looking at a traffic calmed environment, you would want to make the pedestrian more conspicuous, so to the driver it looks as though it is a pedestrian area and they need to adjust their speed for that. The more conspicuous raised zebra crossing would be more appropriate in that environment.

Mr CORBEN — Can I just add a little bit to answer Barry. Some of the work that we have done over the last 5 to 10 years, I guess, in developing the Walk Safe programs in municipalities such as Port Phillip, Stonnington, Darebin and so on, we have looked pretty comprehensively at traffic crashes and pedestrian crashes and have found that something like 25 to 30 per cent of pedestrian casualties actually happen at traffic signals.

If drivers were to comply reliably with signals and if pedestrians were also to comply reliably with signals, then that would probably almost eliminate the problem. But at the moment people do not

comply, and when something goes wrong, usually the speeds at impact are much closer to 60 km/h or more, rather than say at a roundabout where you might actually be down around 20 km/h.

Mr BISHOP — I wonder which level of compliance is the one most at risk. Is it the driver? Let us say you have lights and that is where a pedestrian is injured or killed, it is the driver or the pedestrian? Is there any data on that?

Mr CORBEN — As to who is at fault?

Mr BISHOP — I mean, for example, is it the car going through the red light or is it the pedestrian chancing it against the red light?

Mr CORBEN — I do not think we have reliable data on that. I think it is rare that — —

Mr BISHOP — That picks up Terry's point of who is the worst behaved; is it the driver or the pedestrian?

Dr OXLEY — I think the police would have that sort of data. They certainly would not have data on pedestrian behaviour in general, but they would have data on those who have had collisions with vehicles.

Mr CORBEN — I think we know we have a compliance problem with both groups actually, even when pedestrians are not involved. We have a serious problem with right-angle crashes at traffic signals which can only happen when somebody fails to comply with a red light. And in terms of pedestrians, we of course frequently see the evidence of a failure to comply as well.

Just as another fairly innovative engineering solution that we have been evaluating, we have done some research on this. It is what we have been describing as the 'dwell on red' form of traffic signal operation, which I guess arose out of some research in the mid-1990s and has now actually been picked up for trial and evaluation. It targets alcohol-affected pedestrians on the basis that intoxicated or alcohol-affected pedestrians make up a very big proportion of the at risk groups in pedestrian trauma. Once people are intoxicated, I guess you cannot necessarily rely on them. In fact you probably cannot rely on them at all to behave responsibly. There is evidence from some of our work that people do cross at traffic signals against reds or near the crosswalk but not on the crosswalk. There are a number of problems like that.

The idea of this changing traffic signal operation was that during the high-risk times — certain days in the week, late at night and early in the morning — when alcohol-type crashes are more prevalent and at high-risk locations in and around hotels and nightclubs et cetera where traffic signals exist, we might modify the operation of signals, so when there are no vehicles approaching the intersection and during those quiet times late at night or early in the morning, signals can revert to red in all directions for vehicular traffic, and will stay that way until the vehicle approaches from any one direction and will be detected by the traffic signals in the normal way. Signals will then revert to normal operation and give a green signal to the approaching vehicles. The idea of that is to try to bring about in these low traffic volume periods lower approach speeds of drivers, so the driver is then helping to compensate for the risky behaviour that would otherwise occur from intoxicated pedestrians.

Mr MULDER — Is there a danger that it may form some pattern for intoxicated pedestrians who leave pubs every night of the week and get used to walking through this signage and red lights or signal areas that are there all the time for them, and then all of a sudden, at one stage, they find it has changed?

Mr CORBEN — I cannot answer that question with any certainty. Our evaluation to date has not gone to that next stage. But I think from the intoxicated pedestrians point of view, if

they were to push the button, the signals would normally just revert to normal pedestrian signal operation for them.

Mr MULDER — But as I said, they would be on normal pedestrian signal operation all the time for them, would they not, when the traffic is facing red lights in all directions, as I understand it, and pedestrians would have free movement?

Mr CORBEN — I do not know. I do not think that is the case. I am not certain.

Mr MULDER — They still have to press a button, do they?

Mr CORBEN — I think they have to operate the signals in the normal way as well, so that the signals just rest in this state of red to all directions, and so attempt to bring down the travel speeds of vehicles as they approach.

Dr HARKNESS — But it is red for the pedestrians as well until they push the button?

Mr CORBEN — I believe that is the case. Now, we have done evaluations of both of these treatments — the 'dwell on red' signal operation and also the reconstructed roundabout. We have done quite extensive evaluations of changes in approach speeds over a period of some months before and after the treatment, and what we have mainly found is that there is a substantial reduction in crash risk — the risk of crashes as a result of lower vehicle speeds in both treatments. We have taken those speeds at the 30-metre point, because that is about the last point, for a vehicle approaching at 50 km/h or in a 50 km/h zone, that you want the driver to be aware of the need to brake. So at 30 metres, travelling at the right speed, they can stop before reaching the crosswalk. We have seen reductions in those levels of speed. We have also taken speed measurements actually at the crosswalks where, if a pedestrian was to be struck, it would be more likely at that point. Again there would be quite substantial reductions in the risk of injury as a consequence of the lower approach speeds at that point.

In the case of the roundabout reconstruction we also surveyed pedestrians around the site both before and after the reconstruction and invited their comments and their perceptions about the situation, both before and after. There has also been pretty strong feelings of enhanced safety and convenience which was one of the aims the City of Port Phillip had with that roundabout; it was not only to make it safer but also to make it more convenient — less delay for pedestrians. It also seems that the impact on drivers will not be great, although we have not particularly researched that. But in the case of the 'dwell on red', we are only talking about operating that during the high-risk alcohol times, when traffic volumes are generally pretty low anyway.

Mr MULDER — Bruce, as I understand it, the braking tests — slower speeds reduce your braking time — are all conducted in an environment with the same vehicle on the same road, the same conditions, same driver and a braking pattern. Has there been any work in relation to the age of vehicles, the age of drivers, the cognitive skills and all that, and what impact that has? I would imagine that in different circumstances weather conditions would all distort that information to a degree, would they not?

Mr CORBEN — It certainly changes the results, definitely. Things like the coefficient of friction between the tyre and the road will change according to the type of surface, the weather conditions, the state or the quality of the tyres that are in use — how worn or otherwise they are et cetera. Also the outcome changes as a consequence of peoples perception-reaction times — the need to brake, and that is something that Jenny can perhaps talk a bit more about in greater detail than can I.

We have been doing some work for the TAC at the moment to look at how impairment affects these stopping distance curves — the whole host of forms of impairment. I guess it might be age related or fatigue related or as a result of alcohol consumption, distraction et cetera, or the use of mobile phones. We are looking at the best research that we can find in the international literature

to tell us how those impairments affect perception-reaction time, how that then translates into changes in these curves.

Mr MULDER — Just one more quick question. Has there been any research done in relation to — I know about alcohol-affected driving — hangover-affected driving; people the day after who are not actually still affected by alcohol but who are actually hung over to billyo from a night out. Has there been any done on that at all?

Mr CORBEN — I cannot answer that one; Jenny may.

Dr OXLEY — No, not that I know of.

Mr CORBEN — The next point is just to let you know that we have evaluated some of these measures and the results are positive in terms of speed changes and the expected changes in both crash and injury risk.

Now the third and final of the three points that we wanted to present to you is about the Safe System and how it might influence directions in the future. I do not know whether people are familiar with the Safe System concept but I will just describe it a little, if I can, and we can talk a little more about that if you would like to. It is something that was initiated by VicRoads two or three years ago in Victoria and has since been picked up at the national level. It is now the driving philosophy for our national road safety action plan. It is also built very much on perhaps the best features of the Swedish Vision Zero concept and I think also picking up some of the Dutch sustainable safety thinking as well. It is a major shift in conceptual thinking.

The main points to highlight, I suppose, are that users of the system, humans, will make errors, and we need to recognise that in the way that we design and operate the system. Humans also have biomechanical limits on their tolerance to violent forces in crashes and to being exposed to kinetic energy in the event of a crash, and that needs to be recognised within the Safe System philosophy. There is a requirement by users of the system to comply with key road rules, and provided that happens, then we would expect the designers and the operators of the system to take ultimate responsibility for designing this so that it operates at low risk as well. I guess the final point in summarising the Safe System is that it tries to bring together and integrate the key elements — of the human, the vehicle and the roads — within the context of the kinetic energy model that characterises the system, so that it is a comprehensive system-based model.

That is at the heart of a new way of thinking about how to deliver road safety. We do not quite know yet where that is going to take us, but there is quite a gap, I think, at the moment, between that philosophy, as I have just described it, and the actual practice. So a lot of what we are doing now in terms of our current practices is based on a different way of thinking about road safety. What I guess we would like to see happen is that we try to bridge that gap, and we expect that that would generate a whole lot of new solutions by thinking about the issue in a different way to what we have traditionally done.

Out of that, we would like to think that we can have some demonstrations of new ideas that come from the review of the Safe System approach. So this is compatible with those principles and more than likely that will be about moderating vehicle speeds in pedestrian environments, using traffic calming type infrastructure — a couple of the examples we gave just before are just that, examples of the sorts of things that can be done — and also combining that in pedestrian areas with speed limit reductions that would be supported by high-quality signing. Static signs do not seem to be adequate in those sorts of environments, so we would be very supportive of the illuminated signs that we are seeing in a lot of the busier active pedestrian environments.

We also think that there is an important role with education and training programs to support that approach, particularly within the Safe System. If we are going to get users of the system to comply with key road rules, then it is very desirable that we start early and continue to work on educating and training people so that they do understand the importance of key rules and particularly the

importance of speed. That is something that even adults seem to struggle with — understanding the true relationship between speed and crash and injury risk.

Down to really the last slide that we want to present — it is just to really wrap all of these things up, if I can, and to just remind you, I guess, that walking is an activity that offers great benefits to both individuals and to society and that those benefits are recognised by various agencies of government through their attempts to promote more walking for health and environment and all sorts of other reasons. I think with that comes an obligation to make walking safe. We believe that we know enough already about how to create the right sorts of traffic environments which are calmed, with lower vehicle speeds, more moderate vehicle speeds in high pedestrian activity areas, and the way to design and operate the system to manage and support that low-risk environment.

The CHAIR — Bruce, on that note I would be interested in your comments — or Jennie's — in relation to large residential developments that are no longer required to have footpaths.

Mr CORBEN — Let me think about that. We have been doing some work for a municipality in Melbourne about the design standards for local streets and reviewing them in order to help identify improvements that might occur.

When you start looking at the local street system, you realise that you have got to cater well for pedestrians, be they children, schoolchildren or older people, or people in general. I would think that the absence of footpaths in those sorts of subdivisions is not beneficial, either for promoting and encouraging walking and making it easy or for doing it in a safe way.

Dr OXLEY — I guess what you would need to do in those situations is really look at how we are going to moderate those vehicle speeds. If you do not provide a safe environment for pedestrians to be walking in, that means you have a real mixture of transport modes, and you have to be sure that those vehicles are not travelling over 30 to 40 km/h.

The CHAIR — So it gets back to that issue of speed again.

Dr OXLEY — Yes.

Mr MULDER — When we were overseas we had a look at that Dutch model and at some of the treatments in residential areas, and I was really impressed with what they had done. It was like driving into someone's backyard rather than driving on a road past their property. But in my portfolio I am starting to get pressured from the bus industry association, saying that a lot of these types of treatments make those areas inaccessible for public transport. Do you work with the public transport operators in terms of the work that you are doing with municipalities, ensuring that the needs of public transport are also addressed?

Dr OXLEY — I do not think that it is inaccessible to public transport, but there are ways that you can design, for example, the speed humps. Sweden has a great design for speed humps. Passenger cars need to slow right down to go over these speed humps, but they are designed such that vehicles with wider wheel bases (eg buses) can pass over the device without experiencing vertical deflection. That gets over the problem of bus drivers having problems with their backs, as long as they are still driving at slower speeds. A range of countermeasures can overcome the problems that bus drivers, emergency vehicles and other public transport options have.

Mr CORBEN — It is certainly an issue that we try to be mindful of in this work that we are doing for local government subdivision street design. You do need to cater for public transport and emergency vehicle access et cetera.

Dr OXLEY — The things you were talking about with sustainable safety and what they are doing in the Netherlands and in Sweden are to make drivers aware that they are entering a

pedestrian precinct, and they need to adjust their driving to be able to mix with pedestrians. It is making them change their speed choice in that environment so that they know they need to travel slowly in those environments.

Mr BISHOP — I will take the devil's advocate point of view for a moment. Everything you have said seems aimed against the driver. You correctly say that walking is vigorously promoted, and that is fine. A lot more people are walking now than there used to be, and many of them wear — whatever they do, they are as deaf as a post and cannot hear a thing. What is your view on that?

Mr CORBEN — On the fact that we are directing things — —

Mr BISHOP — They are wearing headphones, have things clipped on their belts and are enjoying the news, music or whatever it might be. They cannot hear anything. Where does the responsibility lie in protecting pedestrians?

Dr OXLEY — There are two points to raise. It gets back to education and training. We do expect people to obey the rules, and that is part of the Safe System approach. If we expect them to do that, we have to make sure that they are educated and trained properly, and that gets back to educating at an early age. We really need to get into schools and educate them on how to cross roads safely. They do need to take some responsibility, but on the other hand we still need to make sure that they are walking in safe environments, so if there is any mixture between the transport modes, we need to make sure that those speeds are down and that they are walking in a safe environment.

Mr MULDER — Jennifer, on that issue you spoke about getting into the schools and education and training in relation to pedestrians, and I think it is the same in the workplace, yet I note from a report that MUARC produced on the Charlton driving school that it did not support driver education. I find it quite extraordinary that when it gets to the driver that any form of education is not supported, yet for pedestrians — —

Dr OXLEY — I think we are talking about a different type of driver education. I am not sure what report you are referring to, but if it is for young drivers — —

Mr MULDER — It was for young drivers.

Dr OXLEY — Right. I think the thinking behind that is that it is more defensive-type driving that was promoted. The thinking behind that is that it may promote younger drivers to elevate their perception of how they can handle driving situations.

Mr MULDER — It was not defensive driving. It was theory, and it was in-school, in-classroom theory, and it was driving in a road environment — stopping, starting, using mirrors and all that type of activity — and yet it did not seem to get the support of MUARC. Everywhere else I go and everything else I hear, even today in relation to pedestrians, is that it starts in the school and with education, yet there is no support in relation to those types of programs.

Mr CORBEN — I cannot answer that. It is not my area of expertise, other than to say that my understanding is that just about all of the driver training attempts that have been made around the world have not been shown to work. I think maybe that was at the heart of the comments that our centre or our colleagues may have made about that.

The CHAIR — I think it was based on the statistics of people who had done off-road driving courses, like the one we are talking. Statistically they were no better off on the roads than people who had not done those courses.

Mr MULDER — They continued to refer to limited data available and the follow-up of those who had been involved in the course. I think they are able to track them. Is that right, Barry? Did you have anything to do with that?

Mr BISHOP — Yes.

The CHAIR — It has been a very vexed issue on this committee, has it not?

Mr BISHOP — I have been very good today, though, Chair. I am very proud about that. We were disappointed in MUARC's report in relation to Charlton. It seemed to miss the point totally. It did not get the issue at all, which was a part theory and part closed-circuit pre-licence driver training and education process. But anyway, that was where the disappointment was. Around the world there is a lack of research in relation to that type of education. Again, it is doubly frustrating when people like you talk about education or saving lives. We have struggled to keep these facilities going, but then people say to us, 'There is not enough research', so you can realise the frustration.

Mr CORBEN — Have your views been conveyed back to MUARC at all, or the views of the committee?

Mr BISHOP — Yes, they have — and everyone else.

The CHAIR — Around the world — literally.

Mr CORBEN — If we could just quickly go back to what you were saying, Barry, about a lot of this being directed against the driver, I suppose that would seem to be the case, but what we are trying to do is highlight what the evidence says about speed and keeping them separated. That does not necessarily mean that we go to 30 km/h across the network or anything like that, but rather I think it is a matter of understanding and recognising that people will make errors, and that if they make errors in certain speed environments, what the consequences will be. That is what we are trying address here.

The CHAIR — I think the point that Barry alluded to first up is an important one. A bit of work is being done at the moment about driver distraction, but from looking around while driving I would say that there is a lot of what I would now describe as pedestrian distraction in that people are walking around with either mobile phones or iPods in their ears and they hear nothing. From a distraction point of view, they are just wandering along, oblivious to their surrounds. When you put someone on a street or a road in that situation, they do become a danger.

Mr CORBEN — That is undoubtedly an issue. I have a friend who died in that very way, so it is a concern.

Dr HARKNESS — And on the same point, it is not just the pedestrian having obstructed hearing, but the new generation of vehicles, the hybrid cars, are relatively silent most of the time. I can see that becoming a problem as these cars become more popular and prolific for pedestrians as well. You cannot hear the vehicle.

Mr CORBEN — Yes. I guess they are examples of human error. We are saying that when that occurs, how do we avoid serious outcomes?

Dr HARKNESS — I was just interested in whether you have done any research or any comparison between pedestrian accidents during the day and at night and whether you have been able to identify any messages which might be able to be implemented, other than the one you described, outside pubs and things to make pedestrians safer at night?

Mr CORBEN — Going back to work we did back in the mid-1990s looking at alcohol-affected pedestrians, and that is the main circumstance where you get pedestrian crashes occurring — that is, during those hours of high risk for alcohol use — there are many things we looked at there as engineering-type solutions. One of them was to put in high-standard street lighting, for example, in areas where there is a lot of night-time activity, be it in the CBD or in Chapel Street or Toorak Road et cetera. That would be one possibility. The whole idea of reducing speeds in those settings is an important line to take. I am not sure that I can recall too many other issues that were particularly about night time.

Dr HARKNESS — Are there any comparisons between accident rates by vehicle movements or pedestrian movements during the night compared with during the day?

Mr CORBEN — Nothing. We have not done any comparisons there. One of the issues I suppose is that at night-time typically traffic congestion is reduced and therefore travel speeds tend to be higher, so from that point of view I guess risk rises just on that simple comparison.

The CHAIR — There was a spate of accidents involving young people leaving country pubs. I recall one west of Ballarat, and a couple were killed out near Deakin University in Geelong where young people left a hotel — badly lit.

Dr OXLEY — It is a matter of making pedestrians a little more conspicuous — whether that is by street lighting — and also bringing those speeds down, and you could have more conspicuous speed signs for drivers. It is raising the profile so people know pedestrians are present.

Mr CORBEN — With the part-time speed limits in shopping strips we also have the opportunity to choose the appropriate time for those lower speed limits to operate — for example, in places like Bridge Road in Richmond they operate for much longer periods through days of the week than those in more conventional day-time shopping strips.

I am not sure that I quite finished this last slide, but maybe I should point out that, if we can undertake some further work on what the Safe System means for pedestrians, then probably new, high-impact solutions are likely to emerge from that activity in the future. I would also like to think that we were able to undertake some demonstrations in pedestrian areas of some of these new ideas as well and see whether they actually deliver the sorts of benefits that we would be hoping for. One of the ways that you can get genuine progress is to be willing to trial some of the things that would not fit into the normal approaches.

The CHAIR — I again thank you both for your time and input. MUARC has always contributed well to our committee reports, and we thank you today for your input.

Mr CORBEN — Thank you.

Witnesses withdrew.