TRANSCRIPT

ROAD SAFETY COMMITTEE

Inquiry into serious injury

Vermont South — 23 July 2013

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Professor M. Stevenson, director, and

Associate Professor S. Newstead, associate director, injury analysis and data, Monash University Accident Research Centre.

The CHAIR — On behalf of the Victorian parliamentary Road Safety Committee I would like to welcome Professor Mark Stevenson and Associate Professor Stuart Newstead. Thank you very much for attending here today, gentlemen, and assisting our inquiry into serious injuries and related matters. As a general remark, the evidence given here has the benefit of parliamentary privilege, so you can speak quite freely. Should there be any information you wish to give in camera, we can go offline as well and take that evidence. You do not have the benefit of privilege outside this room.

Within two weeks or so you will get a transcript of your remarks made today. You are entitled to correct any factual or typographical errors and convey the transcript back to us. It is envisaged that the material will then be placed on our website. Again, should there be any confidential issues you would prefer not to go on the record, then we can take that evidence in private. We invite you to make commentary as appropriate. I understand that Professor Stevenson may need to leave before the conclusion of proceedings. We have about 20 questions lined up for you as well. Any that you would defer to Professor Stevenson can be taken on notice, and he can otherwise respond. We look forward to your contribution.

Overheads shown.

Assoc. Prof. NEWSTEAD — Thank you very much for the opportunity to come and present to you today and to make the submission to the inquiry. In the presentation we will go through today we will really try to highlight some of the salient points we made in our submission and perhaps provide the opportunity to explore those a bit further in conversation and through the questions.

In line with our submission the presentation today is structured in five basic sections. Firstly, we will look at the historical measurement of serious injuries from road crashes in Victoria and make some comment on the problems with those measures and issues related to the data system supporting their calculation. We will then discuss some potential alternative measures of serious injury that a range of recent MUARC research has highlighted, review those measures and also talk about the data requirements to support their calculation ultimately. That will lead us on to talking about the need, essentially, for a more integrated road safety data system for Victoria that includes a new measure of serious injury. Then we will talk briefly about the issues of costing and actually using that to set our road safety strategy into future years. Without further ado, we will move into the presentation.

Serious injury from road crashes has historically been measured based on a police-reported outcome of injury. This is actually not unusual. In fact most jurisdictions around the world define serious road crash injury in this way. When the police attend an accident, they assess the injury of the people involved in that accident and generally classify it against a four or five-point scale. It is pretty obvious how 'killed' is defined. Then in Victoria we use the definition of 'hospitalised', which is in fact the Victorian definition of 'serious injury': someone being admitted to hospital for the injuries they sustained in the road crash. Then there are other injuries that do not require hospitalisation; they might require just first aid, a trip to the GP or whatever else. Then of course there is 'not injured'. In other jurisdictions sometimes they separate that 'other injury' category into medically treated injuries — so those that require first aid or some other treatment — and other injuries that are generally rather superficial, such as maybe a bruise, a strain or something of that nature.

As I say, in Victoria we classify our serious injuries, as distinct from being killed, as those requiring admission to hospital. Most other jurisdictions — certainly around Australia and around the world — use very similar definitions of serious injury from road crashes in their statistical reporting. There are some variations. For example, I mentioned in the submission that if you go to the UK, they also include classification of things like broken bones or contusions that might require significant medical intervention but not admission to hospital, and they are also classified as serious injury.

The more onus you put on a police force to define these things, the more chance the untrained medical person, as in a policeman who has no formal medical training generally, has the chance to misclassify these things. So I think there is an element of pragmatism in how serious injury is defined, and it has to be something that the police can reasonably define off their own bat. We will talk about this more in a little bit, but there is generally some effort by the police to follow up on that serious injury classification, the admission to hospital, through follow-up with the hospital or the patient themselves, but that has varied over time. We will get to that shortly.

There are a number of problems with using a pragmatic approach and relying on police to identify serious injury. I will say for a start that the police traffic information system, as it is known, on which the road crash information is entered is essentially an administrative database for the police to report on infringements that they might have to follow up on and prosecutions that might need to be made following demonstration of guilt in a road crash, so part of the system is to record data for evidence around the need to prosecute people for traffic infringements associated with road crashes.

I think the system is mature enough that it is well acknowledged that it also provides the base data for reporting on crashes in Victoria, but systems change over time and the imperatives for collecting the data change over time, because they are basically governed within the organisation of Victoria Police and how they see their operations and how they allocate their personnel and train them to do their jobs. So what we find over time — and this is common in many police-reported crash data systems — is that changes to the system often create discontinuities in your data collection as well.

A prime example of that was in New South Wales when, in about 1998, they changed the way in which the police form was structured and it was made an online form. Suddenly the police recording of serious injury went very strange; their trends went off beam. They realised it because of the way the online form was set up. The recording was all done wrongly by the police through the system. The decision in New South Wales was, 'We can't get a good measure of hospital admission anymore. We can't fix it, and we can't retrospectively fix it, so we just won't collect it anymore'. In fact that derailed national serious injury statistics collection across the country because New South Wales no longer has a measure of serious injury. If you are in a road crash in New South Wales, the police classify you as killed, injured or not injured, and that is it. There is no attempt at all to classify a serious injury in any way.

We have had similar problems in Victoria, and I will highlight them in a minute, in the next slide. Consistency in the system is always a problem. There has also been variance in the willingness of the police and in fact the ability of the police to follow up people who might be admitted to hospital. In recent times the police have actually been reporting that this is getting more and more difficult, because ideally they go to a crash, record the people who have been involved and say, 'Yes, they've been taken off in an ambulance to hospital', and they attempt to follow up with the hospital where that patient has been admitted. Now frequently the hospital is saying, 'Sorry. It's a privacy issue; we can't tell you'. So the police have no method of validating that hospital admission at all. Even though Victoria Police has all sorts of statutory rights to information, they cannot find that out, so the ability to validate that has become quite difficult in many instances. I will say that the agencies do work together and have tried to rectify this, and we will see some evidence of that in the future.

One of the more specific problems I think we have in the way in which serious injury from road crashes is measured currently is that it is an incredibly blunt instrument. It tells you that a person was admitted to hospital, and that is the definition of a serious injury, but someone can be admitted to hospital to have a fractured wrist set in a cast and then be discharged to a day later, or they can be admitted to hospital with major traumatic brain injury from which they will never recover and it will destroy their life. Currently we do not have the ability to differentiate between extremes of what is clearly a wide continuum of injury outcomes, and we really need to do that. We also have no idea of even what body region is involved in that injury. Recently at MUARC we did an evaluation of the effectiveness of side airbag systems in vehicles. We said, 'We really want to know about head injuries, thorax injuries and upper body injuries, which these airbags are designed to protect. If we look at the police definition of serious injury, we have no idea what body region was injured and we have no idea of the severity of that injury'. So that caused us to look further afield to enhance our database, and I will talk about that a little further. But clearly the instrument we had at our disposal was a very blunt instrument and really not very sensitive.

In fact it may be very insensitive to monitoring progress in road safety as well, because you might have countermeasures that are brilliant in eliminating serious traumatic brain injury but that do not eliminate the hospital admissions. If you use that as your measure, in your trends you will see essentially no improvements, yet you have made a substantial improvement. Conversely you might have other things coming up that are causing very serious injuries that are still all hospitalisations but are at the other end of the spectrum, so it really is not helping people monitor how we are tackling the road safety problem either. I think they are inherent fundamental problems with the way that we currently measure serious injury. From that review, there is no doubt that we need to do something about this and make an instrument that is more sensitive and more consistent.

If you look at trends in official road trauma in Victoria you will see that there is a problem. I would suggest that all of you could work out where a major problem might have been introduced into the system in that chart. Yes, you are right; about late 2005 the police introduced a new road crash information system. They went from what they called their traffic accident information system to the new traffic information system, which was a broader across-organisation system. Suddenly the consistency of data that we had had for many years was no longer the case.

The protocols by which police reported crashes all changed. They used to take a 510 form out to the crash site, get the form, stand there, fill it in with all the relevant details, and that would be entered into the database back at the station. The 510 form was abandoned. There was an online reporting system that they had to access back at the station, so the poor officer out on the beat was standing there going, 'I have to record this information back on the system', so someone got their notebook out and took notes, and they hoped they could remember enough when they got back to fill it in. Others would take a photocopy of the old 510 form out and fill it in on that. Then at least they knew they had reasonably good information when they got back there. But the whole thing became incredibly variable. You can see that in the trends. Suddenly the number of casualty crashes being reported changed. There was also a push by police at the same time to minimise workload through reporting what they considered to be relatively minor crashes.

That is always an operational problem when you are dealing with police, because, like most government departments, they are always under the pump to reduce costs. They said, 'How can we reduce costs for our members and time associated with crash reporting?'. A lot of the non-injury crash — or what they figured was non-injury crash — data collection actually stopped happening. That has actually become official in the last couple of years. That has had significant implication because the consistency in the trend we had had for many years was suddenly not consistent anymore. How do we know what is happening in road safety in terms of our interventions if we cannot actually measure the outcome properly?

At the same time, you can see there is corresponding discontinuity in our serious injury measure, which is the green line at the bottom of that slide. That concerned us because fatality, yes, that is reasonably obvious: if someone is killed, that is a fairly definite outcome. There is still the operational definition, 'must have died from the injuries within 30 days', but that seems to be done. There are all sorts of other implications for a fatality, and police follow up requirements. But certainly serious injury also took a hit because of the problems in validating, the time to do it, the information that was available.

There was also a massive change in the timeliness of the information getting into the system around that time, which affected the trends as well. I mean, if you are trying to go back and retrospectively enter information maybe months after the event, your memory fades on what happened. So you can imagine the quality of information actually changes as well. So I would say it is pretty clear that the police operational changes at that time had a significant impact on our ability to measure road trauma trends in Victoria. It is amazing that we do not learn from the experiences of other jurisdictions, because exactly the same thing happened in New South Wales and exactly the same thing happened in Queensland, and all we do is follow like sheep, making the same problems for ourselves. It is unfortunate that we do not learn from the mistakes of other jurisdictions. But that seems to be how we work. So there is a problem.

In fact one of the things we tried to do at MUARC was to say, 'How big is this problem, particularly at the more serious end of proceedings?'. One of the other data systems that we have available to us is the TAC claims. Now we have a very fortuitous situation in Victoria that the TAC is the monopoly insurer for road injury in this state, and so every claim that is made for a road injury is put through the TAC. They have a very good database which actually records all their claims information. Within that database you can actually identify those who have made claims for hospital admission very reliably, because the hospitals seek compensation for the hospital admission of the road crash victim from the TAC. They send the hospital admission information to the TAC, and the TAC recompenses the health department for the cost of that admission. So they know very well when someone is admitted to hospital.

We actually compared the TAC's hospital admissions data to the police hospital admissions data and also looked at the total claims number, which is an indication of the number of casualty crashes we should be seeing in this state. The top line on that chart, the green line, is the total number of TAC claims, which should be roughly representative of the number of casualty crashes we are seeing in Victoria. As you can see, that does not have a major discontinuity in it. Immediately you can see there was a problem with the police data system.

The other thing you can see in the bottom two lines, which are a comparison of the TAC hospitalisation claims to the official hospital serious injury records and the police data, is that with the introduction of tests they did diverge. So there was a problem with the accuracy of that reporting. Now the agencies have been doing a lot of work with their data quality group to try to cross-validate a serious injury measure between the police system and the TAC claims, and with the involvement of VicRoads as well. You can see that it has actually converged back again. Even if you can get that back right, you still have the data series inconsistency, but you also still have a blunt instrument that does not really tell you a hell of a lot about the injury that has been sustained. I think we can see a problem; we can validate the problem.

The next thing we thought was, 'Let's look at the system by which this data is put together', and this is where MUARC started. We noticed these inadequacies and were frustrated, because for over 18 months VicRoads would not actually give out any official crash statistics, which curtailed the ability to do any research as well because we had no current data until they had worked out what had gone wrong with their system and how to potentially fix it. As you can see, the fix has been a little bit of what we call a bandaid, because it did not really rectify the problem retrospectively; it just acknowledged it existed and carried forward trying to rectify it as time moved on rather than fixing it retrospectively. So at MUARC we said, 'How can we fix this?'. We saw that the TAC claims data has a real potential.

But if we look at how the system works now, this diagram gives you an idea. A crash happens on the road, the police go out and report on that crash — or sometimes people wander into the police station and report on that crash — and the police will lodge a report in the TIS. More recently, as I said, they have actually stopped reporting those crashes which they believe did not involve injury, because there is no statutory requirement for reporting those. The statutory requirement talks about the need to report it if there is property damage over a certain value and the owner is not present. But if those conditions are not met, it is very discretionary. The police could report it and they tended to be very consistent, but more recently with resource constraints they are not doing it that much.

Once those statistics are collated they are sent on and the casualty crashes, those involving injury, are identified and sent through to VicRoads for post-processing. VicRoads actually plays a very important role in this process because it validates information on vehicle details, licensing, road infrastructure, crash DCA coding — all that is validated by VicRoads and made into an official database, which is what it calls its road crash information system. That is then made available to end users, for research, for monitoring — for all sorts of reasons. That is what the public can actually access — Crashstats on the VicRoads website — and do queries of their own. There might be a high school kid coming along and doing queries on road crashes in Victoria. That is the official data reporting system now.

The TIS data not only goes there. When the TAC accepts a claim there is a requirement that that crash that is being claimed against should have been reported to police, so the TAC have some method of validating that claim — that it actually was a crash and they are not being extorted by someone who claims they had a crash and really fell off a ladder at home and is looking for a good way of being compensated. The idea of corroborating that against the police crash report seems quite reasonable. The TAC has always had a link to the TIS to validate its claims. As I said before, the Victorian admitted episodes dataset also comes into play, because the TAC recompenses the Department of Health for hospital admissions and other injury claims, and in exchange for that the Department of Health gives the TAC a lot of information from its admitted episodes database, which goes onto its claims database. That gives them a good profile of injury outcomes in great detail, and it is really important to acknowledge that happening.

At MUARC we said, 'Okay, here's some good injury outcome information that is actually going through the system somewhere that we might be able to get hold of', and so it gave us an inkling to start with that that might be a good process. But as you can see, there is no validation in the VicRoads RCIS system against the TAC claims system. There is some cross-validation between the TAC claims database and TIS as to serious injury, but that has only happened in recent times in acknowledgement of those diversions in classification we have seen before. But it is not an integrated system; it is a set of administrative databases that talk to each other a little bit in some ways to create what we call an almost minimum requirement for end product users and also to run their own businesses.

Clearly VicRoads need to know about crashes to manage road safety and to manage the road network infrastructure, the TAC need a database to manage their claims and the Department of Health need a database to

manage the hospital system and its funding, but they all exist for separate purposes and their assembly for road safety purposes is really more a happy accident than anything that has had significant planning behind it, I would suggest. People are starting to see the potential, but it still exists essentially as that system, with its own operational problems.

I will get back to the potential for that system in a minute. I think it is useful first to talk about what other measures of serious injury are. I have talked about the problem of the current measure being a very blunt tool. This is not really very good for research purposes or even particularly good for monitoring your progress on improving the health and safety of the population with respect to road crashes. In fact MUARC has reviewed a number of these because we are very interested in these injury measures, as well as a finer measure of injury outcome, and they classify into a number of groups. They have been well established by other research internationally, and in fact they are internationally acknowledged measures of serious injury. They fall into three basic groups.

The first we call our resource-use measures, and as it suggests, it is about how much a resource is being used — in this case the hospital system, in fact. In fact the current definition of 'serious injury' that we have is an example of a resource-use measure: how many people ended up in hospital; how many people are using the hospital resource. That is a resource-use measure. There are other variations of that that you can put up. Something a bit more fine is how long you stayed in the hospital — how many days you are admitted for in total. You could work out the probability of being admitted to hospital in any road crash event. All those are examples of resource use. You could clearly extend that down to uses of other resources, like GP clinics and other health services, like rehabilitation et cetera. Generally you find the most expensive road trauma cases are those that end up in hospital, but resource use does not terribly well differentiate them.

The next group of measures we talk about is what we call 'threat to life': given you have sustained this injury, what is the probability that will you die from it? There are a number of well-established serious injury metrics that have been used internationally in this area. Probably the most well-known is what we call the 'Abbreviated Injury Scale', which is in fact a six-point coding of injury severity which goes from 1, being a very minor injury, to 6, being described as almost unsurvivable — not guaranteed death but almost unsurvivable — and everything in between that. What they have also done with that is you can code multiple injuries over a body. A person might have been in a road crash; they might have a broken arm, a fractured skull and serious soft-tissue damage in their legs. The AIS will code each of those injuries, and it will code the severity of each of those injuries. What they came up with to try to put a summary measure of the overall burden of injury on that person is what they call the 'injury severity score', which is the sum of the square of the AIS for the three most serious injuries across different body regions, and that is noted as the ISS. It has a value on the scale of 0 to 72, I think.

Prof. STEVENSON — It is not a continuous measure.

Assoc. Prof. NEWSTEAD — It is not a continuous measure, but it is more continuous than the AIS itself in that it has a much wider range. One of the problems that has been noted with the AIS scale is how to calculate it. I will talk about this a bit more in the next slide, but either AIS can be calculated by direct coding of injury by an AIS professional who is trained to AIS code — and they will code an AIS code for each injury, which includes the body region, the type of injury and the severity within that score, and then the severity can be taken out of that score — or you can in fact derive AIS codes by mapping what we call ICD codes. When you are admitted to hospital the hospital staff code your injuries according to the International Classification for Diseases. It is an internationally accepted injury-coding system. There are various modifications — various versions. In Australia we use ICD-10. In the US they still use the previous version, ICD-9, and in fact we make some modifications in our Australian system to talk about injury causation as well.

Prof. STEVENSON — This is not just for injury. The ICD-10 is for classification of all diseases and injury.

Assoc. Prof. NEWSTEAD — That is right.

Prof. STEVENSON — And it is a WHO initiative, and it is implemented in every hospital globally, whether in a low-income country or a high-income country. It is a standard process.

Assoc. Prof. NEWSTEAD — That is right, so when we are talking about a road crash victim they will also have codes for their comorbidity. They might have heart disease, they might have diabetes — you can get all

that as well, which also helps you understand the survivability of the injuries as well if you can understand the comorbidities they have too.

One of the problems I identified with AIS coding is that when you are aggregating it to form the ISS it is very difficult to work out how different injuries interact with each other for the outcome we are talking about, which is the probability of death. In response to that, we have gone to what we call the ICD-based injury severity score, which is a direct translation from an ICD code to what we call a 'survival risk ratio', which is, for every individual injury, the probability of a death occurring when someone has had that injury. They are calculated by looking at injuries sustained by people and looking at the mortality data associated with that and then calculating a rate between the two things, so it is a bit more direct than the translation from ICD to AIS to ISS. The other thing they believe is that the ICISS score is much easier to develop a translation map — you can develop local translation maps much more easily. They also believe that it better represents the multiple burden of multiple injuries across many body regions on the likelihood of mortality. I think it is seen as perhaps even more preferable than the ISS system — this new ICISS system. The ability to generate local maps is a real attraction, and a number of jurisdictions around Australia actually either have or are generating those maps currently for ICISS.

The last set of injury measures we talk about is what we call burden of injuries. One thing we talk about is threat to life; it is the instantaneous threat, if you like, of dying from those injuries. What they do not often talk about is the long-term burden you might get. You might, for example, lose four fingers off a hand in a road crash. It is not necessarily going to be a big threat to life, but it is going to be a major imposition on you for the rest of your life, particularly if you are a concert pianist, for example — your career is over. So there is another set of injury outcome measures being considered to talk about what the burden of that injury is over that person's life.

One of the most accepted ones, which is again a WHO initiative, is what we call the 'Disability-Adjusted Life Year'. It actually looks at an injury, and if that injury is a lifelong injury, it looks at the distance from the time you sustain the injury to the time you die or it looks at the time you sustained the injury to the time you can fully recover from that injury and then adds up the total time as the injury burden. It needs, firstly, what we call a 'disability weight' — so, what percentage of your daily capacity does that injury create as a disability? Do you lose 50 per cent of your functionality, 75 per cent or 5 per cent? The other thing you need is what we call the 'life table', where you see either how long it will take you to recover or the time you will have to live with this injury permanently until you die, so it is all very dependent on how old you are when you sustained the injury as well.

Prof. STEVENSON — And the weights do need to be applied in Australia.

Assoc. Prof. NEWSTEAD — They do.

Prof. STEVENSON — So once you start accruing this information you can actually create the disability weights for Victoria, state based or on a national base.

Assoc. Prof. NEWSTEAD — There have been a number of Australian studies that have considered using DALY as an injury outcome measure, but because we have not had our own set of disability weights available we have used the ones computed as part of what they call the 'global burden of disease study' that was initiated by the World Health Organisation. They actually calculated global disability weights, which they applied to compare different diseases and their burden on the community and how they affect different countries differently. It is, again, a major international initiative to measure serious injury. If we want to have a truly internationally recognised system that has a very good fine level of detail, these are probably the ones you want to consider selecting from.

Prof. STEVENSON — And these have been operating now for many years, so we are not proposing something that is relatively new.

Assoc. Prof. NEWSTEAD — What I would say is that if you use something like an ICISS or an AIS, if you want it to say what a defined serious injury is, you need to put a cut-off somewhere. If we look at AIS, we consider AIS 3 or more as being quite a serious injury, so you can define that cut-off. It is a little bit arbitrary where you put that, but there are sort of internationally accepted practices on that notion as well. When we talk about ICISS, the accumulated probability of death over all the injuries — your probability of survival —

anything below 0.93 is considered a serious injury or a set of serious injury circumstances. So you can draw single cut-offs or you can actually operate them as a continuous scale, which gives you a bit more flexibility.

One of the big questions when you are talking about whether you should adopt these is: what sort of data do you need to support it? I have done a little summary table here which talks about it. I think uniformly what you see is that you need at very least an ICD code, so the injury code that the hospital assigns to someone after assessing their injuries; we need that information. Fortunately it is available. The admitted episodes database has ICD codes in it, and so it is available through that source. We know that it is a relatively complete census of information on hospital admissions across Victoria, so it is complete and it is there and it is usable.

As we talked about before, if you want to look at things like the DALYs, then you will need to either adopt disability weights and life-remaining measures from other countries or calculate our own, and they do not exist for Australia as a localised set. The advantage with ICISS is that the translation maps from ICD to ICISS do exist and we can generate our own. In fact MUARC has generated its own set from the VAED for Victoria for its own use, so it is very doable.

If you are going to use AIS as your serious injury measure, you need those maps that can convert the ICD code to the AIS code. They do exist, but we find that they are actually relatively out of date now. Because they have come out of the US and the US has not gone to ICD 10 yet, they have not really developed a good set of maps to map ICD 10 to AIS. They will come, because the US is also going to ICD 10 in the future, but they do not really exist now. So that mapping is a little more tenuous.

I guess the other question that remains is that here we are still focusing on hospital admission as a basis because we know we have the good information for it. If you were to want to look at non-hospital admissions, you can ICD code them. The TAC in fact used to do that but it was actually very complicated and time consuming, and for those and other administrative reasons they moved away from that. So now they use a system called SNOMED for coding their minor injuries that are not hospital admissions, because it is much easier for their coders to use. There are potentially maps being developed into the future that will map SNOMED to ICD or AIS directly, but again that is something that is in process.

So it is likely that if we look at a serious injury measure it will still need to be focused around the hospital admission, where we can get that good-quality ICD data, but then we can more finely grade it within that system as well. Everything we have put up there as possibilities we can ultimately calculate. They will require different effort to get the appropriate data up and running, and perhaps some will be available in the short term and some might take a fair bit more effort.

Because we started looking at this and what we use as a serious injury measure, one of the things that we started talking about quite seriously at MUARC was how we could get together the data that we require to actually calculate these measures. It is not sufficient to just monitor serious injury trends. We can go straight to the hospital data and do that, but it is quite useless because we have no idea of the risk factors associated with those injuries: what was the person doing, what car were they driving, what was their licence date, how old were they, what road were they driving on, did they have passengers? All those things are really important to understand in the context of injury outcomes so that we can come up with very good road safety countermeasures that will address those injury outcomes.

It is immediately clear that just measuring the outcome is not enough. The outcome needs to be measured and associated with all the other data that you need to do good road safety research, policy and strategy. All that needs to have all that information tied to it, which is why VicRoads is the current repository of RCIS — because that is where all that information is basically put on and validated. The trouble at the moment is that it is against a very blunt injury outcome measure.

So we said, 'How can we get a better injury outcome measure onto it?'. MUARC undertook a project and we said, 'We know these other data systems exist. Can we put them together?'. For reasons of ethics and privacy, getting through the system an opportunity to match all those datasets together using personal identifiers was considered too massive a job for us with the resources that we had. First we thought, 'Let's try to do it without personal identifiers, so no names and addresses; we will use other linking keys. They can include things like the police crash number, the seating position in the car, the vehicle registration number, so they are not actual personal details as such, but they are enough to be able to link us together'.

In fact, what we managed to do in that project was link all those data systems bar the hospital admissions data. The hospital admissions data was trickier because hospital admissions come from many more things besides road crashes: people have heart attacks, they fall off ladders, whatever else that happens. There are certain codes within the hospital admissions data which allow you to identify road crashes and to a certain degree identify TAC claims. But when we tried the matching process, we found that without a name and address it was not specific enough to match it reliably to the data we had. In the end, we thought that it was actually not a problem because through that process we identified that the VAED data that we were looking at, the hospital admissions data, is provided to the TAC and exists in their claims database anyway, so they have essentially done the matching process for us.

Because the TAC collect police accident numbers and many other details about the crash as part of their claims, what we found is that you can readily match that directly to the system for the police (TIS) and you can match it to the RCIS data that was ultimately assembled by VicRoads. We even matched it to our in-depth data collections that we do through projects like ANCIS, which uses an in-depth process under which we go out and inspect vehicles, interview patients in hospitals and make a very, very detailed picture of a crash — circumstances, causal factors, all sorts of things. We can in fact match all those together even without personal identifiers.

We came up with a system, and in fact currently that system sits within the TAC and is accessed through their permissions and through permissions of the police for us to actually do research projects on. It has enabled us to do things like the airbag study that I talked about earlier because it has those detailed injury outcomes from the ICD codes. We have mapped them through to AIS and we have used it. We have been able to look at the probability of an AIS 2+ head injury with and without a curtain airbag and infer the benefit of that sort of technology. But it required us having the RCIS data so that we could identify the vehicles and the vehicle characteristics. As I said before, you need all the bits of the puzzle put together so that you can actually do all the work that we are required to do, but it can be done. I think that that project shows very strongly that it can be done and the outcomes you can get for it, and the potential that sort of system has for improving road safety research and management within the state is immense. It is an incredibly powerful system.

The power of these sorts of systems is not lost on other jurisdictions. In fact, we have done similar exercises in Western Australia, where they have gone beyond that. They have realised that a linked road safety data system has to have a good measure of injury outcome. They can get that through linking with the records of their health department, which has a data linkage unit to link up the hospital records. It needs to be linked also with all the other administrative data that is so important to road safety. It needs to have all the police enforcement-type information, it needs to have the land use and it needs to have the population data. It needs to have everything in it, and it needs to exist as one big wonderful system that serves the road safety effort in the state. In Western Australia they have adopted this as their sort of blueprint for a road safety data system, and they are now letting the contract for an IT company to come to help them build it. The potential of these systems is not being lost in other jurisdictions as well. With what we have found so far, I think Victoria really has the potential also to follow this system. It is quite exciting to know that we can actually get all this together and see the value that we can potentially get out of such a system.

That leads us to the recommendations that we have made in our submission. Recommending a single measure of serious injury at this stage might be a bit problematic. You probably need at least a threat-to-life measure, and you probably also need a long-term outcome measure to go with it. I suspect that you probably need to monitor both of them because they both probably react differently to different countermeasures and stimulus. I think it would be quite useful to know both things.

You want to stop people dying, but you also want to stop the long-term consequences. At the moment we really do not know, because we have had no opportunity to evaluate countermeasures related to these new outcomes — whether countermeasures actually are equally effective on both or in fact have quite different effects on each and then how you can balance that effectiveness side by side. I would suggest that we would probably need at least two measures if we are going to do this properly.

When we talk about threat-to-life measures I think to us — and this is of course opinion; there is always room for academic debate in this area — ICISS seems like the most relevant threat-to-life measure of what is available, because we can generate our local translation maps. We have the data to support it. We can go directly from whatever ICD system we are running at the moment; we are running 10 at the moment. We will

run 11 in the future and then 12. Each time we change that system we would need to change the resolution of the maps that support the calculation of the serious injury measure from them.

Of long-term outcomes, I think DALY is certainly one that seems to be an internationally accepted long-term outcome measure, and there is a lot of work going on behind it. From our perspective in adopting that, we will probably need to either bite the bullet and say we will adopt the global burden of disease study maps for disability weights — and we could do that in the first instance and ultimately develop our own maps through the data sources we have through the Department of Health and TAC to actually have a local system eventually. The good thing about these is that as long as you have the underlying ICD codes you can always back-map everything to a new system, so you can retrospectively change the system to meet whatever you have decided you will do currently. If you end up with a new map, you can recalculate everything and reuse it that way, so it is quite flexible in that way. I would suggest that DALY should also be considered, but, again, it is open to academic debate.

The thing with DALY is that it has social imperatives, essentially, because what it naturally does is reduce potentially the focus we might have on older road users, for example. The natural thing is that, for two people of different age groups who have the same injury with a lifetime burden, the DALY weight for the younger person is always going to be higher than the DALY weight for the older person because the length of life they have left is much shorter. That becomes a political imperative because if you are saying, 'Okay, Mr 80-Year-Old, we are valuing you less in the road trauma system than you, Mr 20-Year-Old', that is a political decision. Do you want to do that? Ultimately you could potentially do other things or manipulations, but in reality I guess the burden on society for a younger person being lost is in terms of productivity — and this comes out when we talk about injury costings and forgone income et cetera. That burden is actually notionally captured in that way anyway. Certainly it needs a bit more thought before you implement it as a state or even national standard.

The other good thing about these measures too is that, from interactions with other jurisdictions, other jurisdictions are looking very closely at adopting these as well. ICISS is a threat-to-life measure. We know that Western Australia are thinking about it strongly. New South Wales are thinking about it strongly. The Northern Territory are thinking about it strongly. If Victoria came on board, you would have a large part of the country covered, and that is another issue I think needs to be contemplated. If we go out on a limb and do something else, how do we fit into the national road safety picture then? Because we are involved in national strategies and support national strategies, we measure ourselves against other jurisdictions. If we do something different, that is going to be more difficult, so ultimately I think what you want is a national adoption of any new system to do this so we can all compare ourselves on an equal basis.

I think the deliberation going on in Victoria through this parliamentary inquiry is equally as relevant for any other jurisdiction. They would all have different internal problems managing their administrative datasets to get to the point where we want to be, but ultimately I think they could all do it if they needed to as well, because they all essentially have departments of health which monitor hospital admissions for which they could use that data. There just needs to be a mechanism to link it up to the police crash data system, which I guess brings me to the final point on that slide, which is that you need a system which will support this.

I think, from the review, we have seen a lot of difficulty with how the current administrative systems are actually utilised to measure road safety performance in this state and support research and strategy development. I think — and, again, this is an opinion and open for debate — the strongest position we could probably have is to have an office of road safety data which has the authority and the funding to put all this together in a way that created the maximum benefit for the state. It would cost money, yes. Would it ultimately save more money? Yes, so ideally it could be a cost-neutral initiative if you looked at potential long-term benefits out of better managing road trauma in the state.

I think there needs to be some serious consideration of having a central authority responsible for it and responsible for the totality and not just their individual bit, and that entity needs to have authority to mandate what needs to be input from the various agencies who collect the critical data. It needs to be able to go to the police and say, 'Hang on, it is not an option not to collect non-injury data', because part of the problem we have found in matching our datasets together is that something like 30 per cent of TAC claims are lodged against crashes that the police have designated as non-injury. Clearly they were wrong, because people have gone and made a TAC claim for an injury, but there is no feedback mechanism, so the system is failing there. What happens in response to that? The TAC goes, 'There is no police claim. We cannot get one in the system. We

will have to relax our criteria for double-checking the validity of the claim against the police crash report', so the whole system starts into a downward spiral, which is really unfortunate because you will get more discontinuities, as you have seen from system changes we have had in the past.

That is inevitable, so I think a system which acknowledges the value of this data for road safety purposes and has the authority and the mandate to make sure that the agencies actually keep collecting it in the form that is required for high-quality, consistent work is absolutely imperative, and I think we really have not had that. There is also likely to be a problem with situating it within an agency if that agency does not have a mandate or authority over others. It might actually be ultimately better to sit it within another agency. Perhaps even someone like an Auditor-General could set up this system and run it like that, or some other external agency, but it needs the authority and it needs the support of the political process to acknowledge its importance and acknowledge its potential value.

Enough of that rant — my sales job. Turning to the last bits of the submission, we talked about costing serious injury. I note the previous submission certainly talked a lot about that. Costing serious injury typically has not been an area where MUARC has been highly involved in actually deriving costs, so I think we just make a few comments on that. I would say that you could actually only decide how to cost a new serious injury measure when you understand what that measure is. You need to define the measure, then you define how to cost it and what resolution you need to cost it on.

I think one of the advantages is that if you have a much finer measure of serious injury outcome, your cost measures can be a lot finer to go with it and, hence, you can get a lot finer detail out of the work you do with that cost measure. It has always been a problem because we currently have the human-capital-based estimates of road crash costs in Australia from BITRE and an Austroads variant on that, but they are applied often to a crash at a severity, maybe broken up by jurisdiction; maybe between rural and metro there is a dichotomy. I know we used to hear a lot of argument from people like David Andreassen, who used to work at ARRB here, about the fact that you need to go much finer than that if you are really going to look at the effectiveness of a countermeasure on reducing costs. You need to understand the costs on very specific events. I think a serious injury measure would actually allow us to do that and perhaps keep David Andreassen ultimately happy in his retirement. I think that gives us the potential do that.

I think the other thing that certainly needs to be considered is whether we go with the human capital basis for costing or in fact we move to willingness to pay. Australia is very unusual, in fact, in remaining one of the few jurisdictions that uses human capital costs to value its road crashes. I think even in Australia we have people moving away from that now. Western Australia and New South Wales are adopting willingness to pay.

It is interesting to consider road crash costing, because clearly what you are trying to do is mount an economic argument in investment in road safety against investment in other things. I think if you look at it heuristically from a whole-of-society perspective, you would say that as long as we are using the same cost basis for everything maybe that is okay, but at the moment we are not. In fact some people are using willingness to pay for this, human capital for that — we really need to have a consistent system.

Given the way the rest of the world has moved, maybe willingness to pay is better, because it actually acknowledges people's willingness to invest in preventing something beyond the simple material costs that are ultimately estimated through the human capital approach, and I think that is important to acknowledge. I mean, people will buy a flat-screen TV, acknowledging some benefit is far more than the material value of the actual item itself. I think that comes in in every aspect of society and needs to be acknowledged here too, which is why willingness to pay is probably a better way of doing it.

Just finally, on the last term of reference of the inquiry, how to best address the serious injury problem in Victoria, again I think it is a very difficult question to answer in this context because I think you really need to first understand what your serious injury measure is, then understand how your countermeasures prevent that serious injury and then do what MUARC has been doing for so many jurisdictions for years now — that is, use a very comprehensive modelling approach to consider the entirety of the problem and the full gamut of countermeasures you might apply to it in relation to how they are going to address the problem as you have defined it. Clearly, modelling outcomes will be different if you define a different measure of serious injury, because it will give you different priorities on the countermeasures that you put in a road safety strategy. I think that needs to be acknowledged. We have done this for years on the basis that we have. There is no problem in

adapting those modelling techniques to a new measure of serious injury to get the same sort of well-targeted strategy countermeasures that we have had in the past. But I think it is the next step: get the measure worked out first and then work out how you use it best.

The only other point that I would make is that clearly if we have a new injury severity measure, any evaluation work you do in the future will need to be evaluated on the basis of how the countermeasure reduces that serious injury measure as you have defined it. In fact in the short term to do good strategy modelling based on that new measure you might actually need to do some work translating countermeasure effectiveness on the old measure to the new measure as best you can, so that in the interim you can get at least some translation. You cannot go back and do every evaluation that has happened in time based on a new measure so that you can use it in your strategy modelling into the future, but ultimately you will want to know the direct effects of the countermeasures that are available on what you are trying to say. That is enough from me. It is probably time for something from you.

The CHAIR — Thanks very much, Associate Professor Newstead, for your erudition and fluent discourse. They are greatly appreciated. We will run through a number of questions. We have quite a few, and you are welcome to take some on notice should you wish to make a longer response at some stage.

Mr LANGUILLER — Thank you for your submission, as always. You have covered most of the questions we have, but we will go through the motions anyway. In your view, why is it so important to determine an appropriate definition of 'serious injury'?

Assoc. Prof. NEWSTEAD — I think from what I have pointed out, clearly the measure we have now does not reflect serious injury in a very detailed manner. If in fact the countermeasures we have out there now are really targeting only the minor end of the serious injury scale we have, we are still missing a burden on society. We need to understand within even a hospital admission those things that create long-term disability or almost a high probability of death and tailor the countermeasures that we are putting out there on the road to address those with more priority than they perhaps have from the current measure. I think the real reason behind needing that measure is so that we can better target it. I think there is no doubt in the community's mind that its members want to avoid serious long-term outcomes or being killed in a road crash, but we need to define what they are, and the current measure does not do that. The community's expectation is that we invest in those things that best address those things that they are most trying to avoid, which currently we are not measuring. I think that really sums it up.

Prof. STEVENSON — The priority setting is really the key, because by having the serious injury definition that is not only in terms of long-term outcomes but as well a threat to life you can actually get the mix of investment. In essence that is why, when you are planning a health service, you have finite resources and you have to get the best outcome from them. You have to define what is that outcome and how do you best invest to ensure that you have minimised that, and the mix of the two is the key — long-term outcome and threat to life. It is a priority setting task.

Assoc. Prof. NEWSTEAD — Yes. I think because the injury measure and hence the cost measure is so blunt now, you cannot get a very refined estimate of the best package of countermeasures that will give you the best return on the dollar investment. I think that is the key. There are only certain resources out there; we need to use them as well as we can and not be deflected by not having good injury information.

Prof. STEVENSON — And we are not just talking health dollars here, we are talking social marketing campaign expenditure — the whole array of road safety interventions — and we need to know where they are going to best have a return, and we do not know at present.

Assoc. Prof. NEWSTEAD — We have a blunt tool. It probably gives us an idea of where we should be looking but not really how we can best finetune the outcome.

Mr LANGUILLER — A number of submissions have canvassed the use of burden of injury measures such as disability-adjusted life years and quality-adjusted life years. However, these submitters have suggested that Victoria should take a cautious approach to adopting such measures on the basis that there are competing methodologies to produce them. Do you agree with these sentiments; if not, why not?

Assoc. Prof. NEWSTEAD — That is a difficult question. Of the threat-to-life measures we have reviewed, the one that seems to have the best scientific basis is the disability-adjusted life year. I think the quality-adjusted life year is probably the most reasonable alternative to that, but it is a little bit more subjective: how do you accurately measure quality of life lost. It is probably fair to say that is the difficulty with that measure, which is why we had a PhD student about seven years ago, Wendy Watson, who did an extensive thesis in this area looking at the validity and construct of the different measures. She really favoured the disability-adjusted life year.

Her conclusion after many, many years of intense study of this was that the disability-adjusted life year seem to be a much better measure of long-term outcome. But she did note in that thesis that getting the disability weights right and getting the life issue associated with it right really requires some effort. But they can be based on objective data, and I think that is the advantage. I think that is why it is a favoured measure.

But as we have stated, they measure different things. Threat to life is quite different from long-term outcomes. I think the TAC would agree that their claims burden from long-term outcomes is horrendous, because if you have an acquired brain injury that lasts for your lifetime and you are only 25, the compensation on that, which is partly a reflection of what it is going to cost the community ultimately to look after that injury, is horrendous. Even a threat-to-life measure does not really encapsulate that alone; you really need to look at that long-term outcome as well.

Prof. STEVENSON — There has been a lot of discussion in the literature. It is sort of an academic discussion between DALYs and QALYs, and I would hate to think the parliamentary inquiry would get caught up in that milieu of academic argument. The key is a long-term outcome measure, which is crucial in terms of really grappling with the serious road injury measure, and we recommend DALYs.

Assoc. Prof. NEWSTEAD — I think it is fair to say we recommend it on a pragmatic basis. It needs to be able to be objectively calculated and consistently calculated, and I think the DALY offers that more than the QALY.

Mr LANGUILLER — According to several submitters, the European Union has adopted the maximum abbreviated injury score 3+ injury measure to define 'serious injuries'. Why do you and others believe the ICD-based injury severity score measure is the best option at present for Victoria?

Assoc. Prof. NEWSTEAD — I think for a number of reasons. Firstly, you can generate the local maps between injury and the severity. That is important, because to a certain degree the severity and outcomes of an injury can be determined by the standard of the health-care system you have around it as well. If you are comparing the same injury and its long-term outcome in Australia compared to if you go to Zambia or somewhere like that where their health system is atrocious, we will have probably a better long-term outcome than they will in those countries where their health system is inadequate, which is part of the argument, I think, for why you need a local map — because it needs to represent the level of resource you have in your health system to actually treat you within an appropriate time and rehabilitate you effectively as well. I think that is the first important point: so that you can reflect that in your own mapping system.

The second is the point we made about the fact that researchers found that ICISS probably correlates better with the threat to life across multiple injury areas than the MAIS particularly. I think that is an important point because, particularly in road crashes, generally it is not just one injury sustained. There are quite often multiple injuries, and you need to reflect the total burden of those injuries on the person and their threat to life.

Prof. STEVENSON — Also, we are aware that Europe has introduced that, but there are pragmatics around the MAIS as well as to why they might introduce that across a whole array of countries that have variations in coding and classification compared with, say, a country like Australia, which is pretty much standardised. We have been using ICD. We have our own Australian modifications to the ICD, and it is a much more sophisticated outcome measure.

Assoc. Prof. NEWSTEAD — And just the thing I would add: given that we are proposing most of these measures that are based on an ICD score anyway, there is no reason why if you wanted to make international comparisons you could not use our data to calculate an MAIS anyway. In fact you could make that international comparison, then, on the same basis. It does not preclude that. We are not isolating ourselves internationally; it

just means that we are saying, 'We believe this is a better measure of burden on society that we want to target our resources towards'.

Mr LANGUILLER — Thank you.

The CHAIR — I might just throw in a question, if I may. Yesterday the committee was told by the Department of Health that moving to the ICISS system would cause a change to their datasets which use the ISS. This could make existing data incompatible to ready-coded ICISS data. Do you agree?

Assoc. Prof. NEWSTEAD — I am not privy to the thinking on that, but I would actually not agree with that, because I say we have actually calculated our own survival risk ratios from the current data the Department of Health has.

Prof. STEVENSON — It is ICD based. It is off their code.

Assoc. Prof. NEWSTEAD — Yes. I mean, the biggest threat in hospital coding has actually been the casemix issues early in the 1990s, particularly when it was first introduced. It actually made them code some injuries more commonly than others because they got paid better for it.

The CHAIR — Yes.

Prof. STEVENSON — But that does not exist anymore.

Assoc. Prof. NEWSTEAD — No. That system — now the DRG stuff that determines the hospital funding — seems to be ironed out.

Prof. STEVENSON — They may be referring to survival rate ratios and things like that that need to be mapped. They probably are not familiar with that, but that is very basic; it is not very sophisticated. The software — it is not difficult.

Assoc. Prof. NEWSTEAD — I think, in summary, I cannot understand that comment.

The CHAIR — Thank you.

Mr ELSBURY — In your submission and also in your presentation this afternoon you outlined a number of issues with the existing approach to data collection, categorisation and sharing in Victoria. You also recommended the establishment of a road safety data office. Can you expand on your recommendation and how it will overcome the issues you have raised in your submission and also today?

Assoc. Prof. NEWSTEAD — I think that is a very pertinent question. I think a lot of the issues that were identified in road safety data collection come down to, basically, financial pressures within the agencies and the fact that there is no imperative within the agencies to necessarily be collecting this data. We use it as a happy coincidence that it exists, but there is no acknowledgement currently that that data serves a purpose more than their own administrative need — or very little acknowledgement, I would add. I think the alternative value of that data needs to be emphasised, but we also need to, as I say, have authority with the agency to make sure that it can be mandated that they do collect this information in a certain way, because it is needed for purposes outside their own internal uses.

Also, with the idea of establishing a separate office, when we talk about internal funding, the agencies — for example, the police force — will get a global budget, which they will have to divvy up to do the things they do within their mission and activities. You can see that a data collection activity like TIS is often under pressure from all the other things that happen within the agencies.

If, for example, you had a road safety data office, it might actually provide the funding to do that data collection within the police, and it may not necessarily be an additional impost on the Victorian budget, for example. It may just be saying, 'Okay, we're going to reserve this element of the police budget to make sure that that data collection happens properly', and that money might be managed through the office of road safety data, for example. That would make sure that the funding was there — it is not being pressured away from other agency funding pressures — and also make sure that they had a mandate, which is why if that existed within a

high-priority area of government, like a VAGO or like Treasury or something even like that that had a strong mandate to oversee the activity, it might give it some status.

What we are really pointing to is the need for that activity to have status and not be some sort of secondary activity that is a nuisance to them that they think they have to do and then change their mind on every few years and it all goes haywire. That really is the imperative here. If you had someone with direct responsibility for doing it as well, they could also be responsible for the development of that system into the future, so as new issues emerge they could be on top of those and say, 'How can we enhance our data systems to cover those new issues as they emerge?', rather than having endless meetings that amount to nothing amongst government agencies to talk about doing it but never having it done.

Mr ELSBURY — What are you suggesting?

Assoc. Prof. NEWSTEAD — I am just giving you some observations from many hours of meetings I have spent and frustrations. As researchers we really would like this information so we can do good research with that. That is imperative.

Prof. STEVENSON — Not only just research, though; there really is an imperative to move forward because we are into the information and communications technology arena. We are actually in this state being left behind because we are not actually seizing opportunities, and those opportunities are all based on data and information and information sharing. If you cannot get administrative jurisdictions in this state to actually ensure that they are collecting in a standardised way and a centralised way that can be used for setting agendas, for research and for regulatory reform, which is what is going to be needed to deal with the ICT future we are dealing with, then we are going to be leap years behind most other jurisdictions that are already way ahead.

Assoc. Prof. NEWSTEAD — Yes, and the point at the moment is that no-one has that ultimate oversight of that job. They are all doing their little bit and trying to coordinate it, but there is nothing with oversight. The mandate and its mission is to do that job.

Mr LANGUILLER — Through the Chair, if I may, I asked of the Department of Health yesterday what the impediments were, and there were two barriers: one, the agreement to share data; and two, legislation is required.

Assoc. Prof. NEWSTEAD — Precisely, which is why if you had an office of road safety data you could identify the legislative requirements. It could get the privacy issue sorted out. This is a problem: each agency has even a different interpretation of what the privacy legislation means, and they use it in different ways at different times. It is ultra confusing.

Prof. STEVENSON — We do research across the whole of Australia. I can run a large study in three states, and I will get 80 per cent response fractions in two states and I will have one state where I can get 2 per cent, purely by how they have interpreted the privacy act or something else. It is as simple as that in some ways. We need to have some jurisdiction which takes responsibility around privacy and the use of identified and de-identified data and has some authority over it.

Assoc. Prof. NEWSTEAD — Exactly, and ultimately if you have a road safety data system, you need someone to control its access because it does not exist just to exist; it needs people to be able to access it, and it needs people to be able to access it at different levels, with different levels of authority and with different levels of detail, based on privacy and security protocols. That all needs to be coordinated, because at the moment it is very ad hoc, so some people can do some things and other people cannot. That is something I see an office with that mandate as being able to do: actually establish those protocols.

Mr LANGUILLER — Can I just further ask: in your judgement, who would be the custodian of that data? How would you envisage that structure? I am thinking through this as a legislator and parliamentarian. Unfortunately these sorts of issues tend to sometimes trip over that issue of bureaucracy and who copped what and who is responsible for what. Who would be the custodian? How would you envisage that structure? You talked about the Auditor-General, for example, or putting that under the jurisdiction of the Auditor-General.

Assoc. Prof. NEWSTEAD — That was an example.

Mr LANGUILLER — That is dangerous to political parties of both persuasions!

Assoc. Prof. NEWSTEAD — Maybe that is a good thing! I take your point. Obviously there would need to be a lot of thought put into this. We could only take this on notice. Our recommendation is that it needs to be a Victorian government asset because most of the data exists in Victorian government agencies, but it cannot sit within one of the agencies, I do not think, because it would then have their imperative imposed on it. I do not think that is good for the system, which is why it needs to find a place within the government agencies or within a government structure that can actually house it and has the authority, but where that should be I cannot give you a firm answer on. There are some suggestions, but I think you would need to think very carefully about how it would work to give it the maximum possibility through the political process as well. Because you are right: if you do not get it right, it could all just fall in a heap, buried in that same bureaucracy.

Mr ELSBURY — Your submission identifies systemic problems, and as we have just heard, there are also other legislative impediments in the way, as well as the graphical representations you presented today showing the challenges, perhaps, in the way that the data is collected in Victorian road safety data and the need for it to be rectified before any new serious injury measure can be derived. The committee is aware of previous work done by road safety agencies to improve the current data situation in Victoria, including working groups and data committees. What do you think is required to correct these systemic problems, and how could it be achieved?

Assoc. Prof. NEWSTEAD — It almost carries on from our previous point, doesn't it? I think part of the problem is that a lot of the working committees around this data are people who have no real authority. They understand the data implicitly and understand the importance of the data, but they do not actually come from the level within the agencies that actually has real authority to make the change. It is a little bit difficult to understand, because you have to understand the intricacies of the internal interactions in the agencies, but because perhaps there is not good communication between that level of operation and senior management within those agencies the imperative never seems to make it to the very top level.

To be fair, we are seeing some changes. Some of the data quality working groups you have seen have helped correct the misclassification of hospital admission, and that has been good work. We now have VicRoads, with their RandL system, talking about how we get road infrastructure data on board and how we integrate it with everything else, but it has not really ever been a top priority. They consider data systems as an annoying necessity that they will draw on when they need to rather than an actual enabling infrastructure, and I think the whole attitude really needs to change for a lot of those systematic problems to potentially be averted in the future, which is why we have talked about the need for an overseeing governing body in the office of road safety data — if you want to call it that. I think that is the key because it needs to have the correct status.

I am a statistician, so it seems obvious to me that if you do not have good data, you cannot make good comment on things and you cannot make good policy, but that point often seems to be lost throughout the agencies because often policy is made up of people's random thoughts or a reaction from the minister or whatever else. It is difficult, but they need to have it at their disposal to be able to make the best policy, and that is what we have been talking about: understanding what the problem is and how to best address the problem to give the community the best outcome for the money they can invest. It is all implicit in this whole thing, but it is not given that recognition at the moment.

Mr ELSBURY — Certainly there has been a lot of talk of Western Australia and how they approach their data, and they are leading the nation, basically, in the way that they collect their data, bringing it together and using it to make more sense about what is actually happening out there in the real world. In your view, what makes their approach superior to that of Victoria?

Assoc. Prof. NEWSTEAD — Let me say first, I do not think they are three lengths in front. I think they are perhaps a nose in front.

Mr ELSBURY — Okay.

Prof. STEVENSON — Yes. I used to preside over that. I used to sit in the research group.

Mr ELSBURY — Is that a little bit of parochialism though, not wanting to admit that that there is another state better than Victoria?

Assoc. Prof. NEWSTEAD — No, no. I do not care, because we work in every state. In fact we want every state to be the best to facilitate our research.

Mr LANGUILLER — We want to hear from Mark as well.

Assoc. Prof. NEWSTEAD — I think they have things in place. They have a much better relationship between their agencies than here. The Insurance Commission of Western Australia plays a critical role in this, and it is not something we see so much in Victoria at that level. In fact through the insurance commission they have an online crash data reporting system, which is a way they can get non-casualty crash information into the system at relatively little expense and effort from police members, for example. That is an example of something they have done well.

I say they are probably only a nose in front, because they are acknowledging the problem. They have a blueprint, but they have not implemented it yet. There is still a long way that they need to go, and there will still be the same interagency conflicts that they will have to get over as well. They operate a very lean operation over there, so actually getting the resources to do these things is often quite difficult for them. I think you need a better situation in Victoria in terms of the potential resource we could put into the problem to actually get a system running before Western Australia, but the blueprint is not really any different. You could apply the same blueprint to any state. You could each adopt it; it is a matter of how you coordinate your resources to realise it.

Mr ELSBURY — We could borrow their template and move straight over?

Assoc. Prof. NEWSTEAD — Yes. No problem at all.

Prof. STEVENSON — A lot of their template has now been extended by the work that MUARC is doing. I guess why I want to come in on this is that their linked dataset emanated out of a research group that I worked in for a while, and that was the demise of it as well, because it was not resourced appropriately. Great work went into the linkage, and then a research centre fell over because there was no funding and little had been done with linkage — and this was started in 1988. They are not that far ahead of where we are now, and yet in 1988 they had the whole linkage set up and were leading internationally on it. It really reflects our submission here in that we do not believe it is something that you just dump on your own research group necessarily. It needs to have authority; it needs to be an office that has some resources associated with it, otherwise it will fall in a heap and will not achieve what you expect it to.

Mr ELSBURY — You said that WA is running a fairly lean operation and that we would have a better ability to resource such a set-up. Would you have any idea of what the cost would be for it to be implemented in Victoria?

Assoc. Prof. NEWSTEAD — That is an impossible question to answer off the top of your head. It may ultimately cost nothing — it is just a reorganisation of current funding; it is just a strategic approach — but I think ultimately to enhance it you would probably need to invest in it as well. I do not think we are talking hundreds of millions of dollars; we are probably talking less than that. It does not need to be a massive office of many, many thousands of staff either; it just needs to have a mandate and an authority and some good people staffing it, and I think it would achieve a lot. But what it would ultimately cost, I do not know.

Mr PERERA — This is the independent office of data?

Assoc. Prof. NEWSTEAD — Yes.

Mr ELSBURY — What issues would decision-makers need to consider when deciding whether Victoria should integrate the various crash and injury datasets?

Assoc. Prof. NEWSTEAD — I think we have heard about one of them. Immediately you have to overcome the perceptions of problems with privacy and access and control, and in getting the institutional politics sorted early on it would be quite critical to say, 'This is the imperative. This is why we are doing it. This is what we will require of you and this is how it will be facilitated'. I think in our submission we may have even suggested that an office of road safety data may actually need some of their staff to be sitting in those agencies so they have the local knowledge of what other conflicts happen associated with this data so they can report back and

then work with that agency. They need an intimate working knowledge of where the data comes from so they can foresee any problems that might come out through policy or operational change.

To a certain degree the office may be somewhat virtual, but at least they would own the staff who sit in the agencies so the agency could not say, 'Oh, we've had cutbacks. You get the package this week, and we won't worry about that anymore'. That is the sort of thing that can easily happen in agencies when it comes to data systems.

Proceedings in camera follow.

Open hearing resumed.

Mr PERERA — The committee has received 36 submissions as part of this inquiry. A recurring theme in most of them is the lack of information about term of reference (d), which is the correlation between different countermeasures and reductions in trauma. Is MUARC aware of any studies or research that have determined which countermeasures have reduced trauma, and if so, by how much?

Assoc. Prof. NEWSTEAD — I guess the reason we did not comment on it is that we are talking about quite different measures of injury outcome here, and historically evaluations have not focused on them. There is of course some correlation between each of those measures of injury outcome, but each way they are subtly different. Depending on the crash circumstance or the problem or the countermeasure set you are looking at, you could get a quite different answer looking at one measure compared to another. We have not done a lot of work yet comparing what those differences mean, because we want to get to a stage where we have our data systems sorted in a way that we can look at the different measures and start looking at them in relation to different outcomes, and I think that will be a very important part of the process. But to my knowledge, at the moment the information to answer that question is not very well developed at all, which is probably why there have been very few responses to it in that way.

Mr PERERA — In your opinion, which countermeasures are proven to have reduced trauma? Is that one you can answer?

Assoc. Prof. NEWSTEAD — We know the ones that reduce trauma on the current measure, and there is a whole raft of them. We could sit here for the next 3 hours going through them all, and I think they are well documented. The road safety strategy, because it has been formulated on a modelling process, actually identifies them against the current measure. The point here is that if we adopt a different measure, would that focus change? I do not know.

Mr PERERA — Is that documented? Did you say it is documented?

Assoc. Prof. NEWSTEAD — The way in which we have formulated strategy advice for the agencies in the past is very well documented, and it follows a very rigorous modelling approach to say, 'Let's identify the problem, let's look at the countermeasures, let's look at the cost of implementing the countermeasures against the effectiveness and work out the best reductions we can get for a level of expenditure'.

Mr PERERA — Will that be available to the committee?

Assoc. Prof. NEWSTEAD — Yes, absolutely.

Mr PERERA — If we do not know which countermeasures reduce road trauma, how can we can assess their cost-effectiveness?

Assoc. Prof. NEWSTEAD — That is exactly the point I made previously, that if you are adopting a new measure, you need to evaluate on the basis of that new measure ultimately and in the interim you potentially need to have some way of at least crudely translating the effectiveness on the old measure to the new measure. I do not know exactly how you do that yet, but it is just an area of work you would need to concentrate on in the translation. But ultimately if you formulated your strategy around reducing the number of cases where you got an ICISS score of less than 0.95, then you would evaluate on that basis and say, 'How effective was this countermeasure in reducing those cases?'. You would reformulate your evaluation frameworks around the new measure.

Mr PERERA — According to the submission from the Institute of Road Safety Research in the Netherlands, the SWOV, road crashes resulting in fatalities are different types of crashes than road crashes resulting in serious road injuries. The SWOV suggests that the causes of crashes resulting in serious road injuries can be traced to system errors rather than extreme behaviour. On this basis, the SWOV concludes that policy aiming to reduce the number of serious road injuries needs to be different to policy aimed at a reduction of road fatalities. What are your thoughts on these statements?

Assoc. Prof. NEWSTEAD — I could not agree more. I think it is absolutely pertinent. I think in fact so many jurisdictions' mono focus on fatalities as the outcome in road safety is incredibly unhealthy because, firstly, we live in a relatively safe road environment in Australia. There is very often not the number of fatalities you need to evaluate the effectiveness of countermeasures on fatalities alone anyway, so it is very difficult to make statements on that basis. But I agree, there are quite different mechanisms that drive serious injury and long-term outcomes potentially compared to fatalities, and that needs to be acknowledged, which is why a mono focus on fatalities is probably taking us in the wrong direction in terms of our strategy of priorities. I absolutely concur with what SWOV have said.

Mr PERERA — Many submissions note that evaluations of countermeasures in Victoria are quite limited, with the exception of black spot programs. In your view, why is there such limited information on the effectiveness of different countermeasures implemented in Victoria?

Assoc. Prof. NEWSTEAD — I am surprised at that statement, quite honestly, because we have certainly been involved in evaluating black spots, but they are by far and away not the only things we evaluate. We have a very strong background in evaluating enforcement, social marketing, vehicle safety — —

Prof. STEVENSON — Vehicle devices. The list goes on. There are just so many.

Assoc. Prof. NEWSTEAD — I guess a tour of the MUARC website would show the breadth of the evaluation work that we have done. I think there has perhaps been a little too much focus on road infrastructure and black spot improvements recently. We look at everything and have looked at everything historically — bicycle helmets, motorcycle interventions; you name it, we have been there. The statement is very surprising.

Mr ELSBURY — What other tools or approaches do you think could help manage long-term reductions in injuries, particularly serious injuries?

Prof. STEVENSON — Tools?

Mr ELSBURY — Yes.

Assoc. Prof. NEWSTEAD — I think the modelling tool has been demonstrated by MUARC in the past as a very good tool, because it gives a systematic focus to identifying the problem and selecting the countermeasures. I think as a tool speculative research is probably something that you could do a little better because at the moment we tend to do well taking what we know and applying it to the problem we have. But in terms of new and innovative ways to address the road safety problem, there is not an awful lot of investment in more speculative research about new and innovative ways to address the problem. As a tool, I would see research as definitely needing to fit more into that mould in the future.

Mr ELSBURY — We have heard from submitters we have had some interviews with that by and large a lot of the engineering problems have been dealt with either through black spot programs or with the new standards that are required of road infrastructure when it is constructed. It is no longer about 'This is the place to get the job done; this is a major concern that needs to be dealt with', it is more a case of, 'It's spreading out over a greater area and it's no longer a simple treatment'. The engineering has gone out of it, but it has become more of a spot problem that has to be dealt with. Instead of having a black spot program that deals with an intersection, how do we deal with it when it is the odd issue up and down a road that we have to deal with?

Assoc. Prof. NEWSTEAD — I find those comments a little bit surprising too, because to suggest that the engineering problem is solved is a bit delusional, quite honestly, because we have such an old infrastructure in our road network in this state and across the country that there is no way that the engineering problem has been solved everywhere.

Mr ELSBURY — Okay.

Prof. STEVENSON — And, look, it is probably one of our significant challenges moving forward, with the vast network that we have. There is no way we can deal with all of the elements. In fact it highlights a whole bunch of other areas that we also need to focus on which are going to assist us in terms of the infrastructure, which are around utilising technologies to assist us in managing our infrastructure in other areas.

Assoc. Prof. NEWSTEAD — And appropriate enforcement to enforce the appropriate use of the infrastructure. This is where the MUARC model of multidisciplinary research is incredibly important, because we might say, 'Okay, we've identified a crash problem in a strip shopping centre, and we've whacked in a 40-kilometres-an-hour sign. That's an engineering solution. We've fixed the problem'. Our recent simulator research shows that you have not fixed the problem, because people do not adapt to that situation at all. So if you are not looking at the behavioural aspects in association with the engineering aspects, then you are missing half the picture, if you like. How do people adapt to their environments? Engineering might have a view of believing they can fix everything with an engineering or a technological focus, but there also needs to be a behavioural and behaviour-enforcement element in all of that or it will not deliver what you think it will deliver. That is the tool: it is understanding the full gamut of everything that impacts on the outcome and not just compartmentalising it and trying to operate discreetly in compartments. It inevitably leads to missing part of the equation.

Mr LANGUILLER — Just on that, what are your views on the effectiveness of behavioural countermeasures such as enforcement; public education campaigns, such as those created by the Transport Accident Commission; and training? Are they cost-effective, and is there research that you can refer our committee to and evidence to that effect of their being cost-effective?

Assoc. Prof. NEWSTEAD — Certainly. Enforcement has proven time and again to be a very cost-effective countermeasure. We talk of a safe system, but a safe system is meaningless if people are not using it in the way it was designed to be used. Enforcement is actually a critical overlay.

Prof. STEVENSON — There is an array of studies that we have now that will outline the variations on enforcement and the outcomes that you achieve.

Assoc. Prof. NEWSTEAD — For example, if we look at our evaluation of the Queensland mobile speed camera program, it came out with a cost-benefit figure of 60 to 1. You cannot get anywhere close to that with a road engineering solution. And even when we are talking about the higher margins of increasing it, the cost-benefits are only down to about 25 to 1. So I think there is immense potential. You need to ensure that people are using the system as it was intended. You can either have technological solutions that intervene when they are trying to use it inappropriately, although I think the issues of public acceptability of things like intervening ISA are still yet to be played out in the community, or you can go down the enforcement road, in which effective enforcement is incredibly good value in reducing road trauma. MUARC has done numerous studies of enforcement initiatives and has shown time and again that they were very worthwhile and very cost-effective, particularly if you get the model right.

I would point to something like the mobile speed cameras; that program is a great model. It is not an incredibly huge resource, when you look at it in terms of expenditure, but with the reach it has and the effectiveness that it has — and I think that was confirmed by VAGO through its review — I think it is incredibly good.

Prof. STEVENSON — And we are working on the edges of that in essence to refine all of the models that we use to gauge the best ways of enforcement, so the potential outcomes will be more in the future, particularly the returns.

Assoc. Prof. NEWSTEAD — Yes, but the best return you get out of enforcement is creating a strong perception within the community that you can be caught anywhere, anytime. Whether it is drink driving, speeding or mobile phone use, those sorts of enforcement approaches are incredibly cost-effective. You just have to get them right.

Mr LANGUILLER — It is interesting, you might create the perception.

Assoc. Prof. NEWSTEAD — The primary example, and it is something that the public is not entirely aware of, is the idea of random breath testing. Random breath testing is actually very poor at intercepting drunk motorists, but it is very good at creating a perception that you will get caught anytime. That is what an effective enforcement regime does: it tricks the population into thinking they are far more likely to be caught than they actually are. That is brilliant. That is what you want to happen, because then you put less effort in for a greater deterrent outcome. That is exactly what the mobile speed camera program does too, although that combines with a reasonably high chance of getting caught as well, so it has the double whammy. Those are the sorts of models where enforcement can play a role.

When you talk about social media, I think social media is important for conveying information. Our earlier work that we did on evaluating the TAC campaigns showed they were most effective when they were done to support a concrete enforcement initiative like drink-driving enforcement and like speeding enforcement, and they seemed to complement them very nicely. It raised the awareness of the issue and changed community perception. It takes a long time. You cannot do that overnight. It takes a lot of intense enforcement backed up by good community messages to change the psyche. Drink-driving took — what? — 20 years to change that psyche ultimately. Speeding is on the way if it is not there yet. So I think it has a role, and it must be used judiciously.

Amazingly the research we did looking at the TAC campaigns — and as much as the community complained about them — showed those that had a really emotive message that really drew the viewer into the message were the ones that seemed to be the most effective, even if they were emotive but not attached to something that they could identify with as a concrete concept. Fatigue is a good example of that — the fatigue ads that the TAC run. According to our evaluations they did not really seem to have much benefit, because it is not an enforceable behaviour. It is something that is actually very difficult to convey to the population — 'When are you fatigued?'. You need concrete messages that they can understand and react to. I think that is where the role of social marketing comes in to help other things you are doing. I think it probably has limited value on its own, but when it is part of a package of activities, I think it actually has benefits, and that is what the research suggests.

The CHAIR — The last few questions: the committee is interested to hear your views on the role of intelligent transport systems — ITS technologies — as a road safety countermeasure. I can lead on just to embellish that: what are the leading ITS technologies that have been shown to improve road safety?

Assoc. Prof. NEWSTEAD — It depends, I guess, on the scope you put on what is an ITS technology.

The CHAIR — Reasonably wide.

Assoc. Prof. NEWSTEAD — Is ESC an ITS technology? In some respects it is. It is anticipating the driver and technologies taking over. ESC — brilliant. Evaluation has shown it to be one of the best vehicle safety technologies we have had in years. ISA has potential, and we have done some studies on it, although ISA is probably best if it is put in and it allows haptic feedback and ultimately intervention. Even being in there as an advisory device, recent work we have done suggests that it is a very good device.

The CHAIR — For the assistance of Hansard, we would like you to explain that.

Assoc. Prof. NEWSTEAD — It is 'intelligent speed adaptation' technology, which basically reads the speed zone from the satellite information, the map information, and then advises whether the person is travelling faster than the speed limit or not.

Prof. STEVENSON — There is an array of in-vehicle technologies, and they have varying degrees of benefit, all potentially quite positive, but the real potential is that most of this work has been around crash mitigation versus crash avoidance, which is the vehicle to vehicle and the vehicle to infrastructure, and the wireless communications, which is really where we are going to see some real benefits in terms of crash reduction. Already the technology is being developed for that. There is a designated short-range communication being allocated for that. There are trials in the US and Europe that are showing the effectiveness of it and are developing up the regulatory framework for that. So there is enormous opportunity in Australia to take a lead on it, particularly since Australia has taken the lead in terms of some of the technology that has been used in this. So there are the current standard sort of ITS approaches that Stuart has highlighted, but the future has enormous potential in relation to road safety.

Mr LANGUILLER — If I may, through the Chair — and I do not mean to be facetious; I am respectful of that — but there is a road in the electorate that I represent that had three, and sometime before that four, different speed signs within 2.5 and 3 kilometres; you know the kind. They must be really intelligent systems. I really mean the question in terms of: how quickly can they actually change to pick up these extraordinary differences of speed in relatively short distances?

Assoc. Prof. NEWSTEAD — The ones that require things like intelligent speed adaptation need two things: they need a good map, and I think agencies have been working hard on that, but it is still not perfect; and secondly, they need you to be able to lock onto the satellite technology adequately to pinpoint your location quite precisely, and in some areas they can and in some they cannot. So it is still not perfect technology.

Mr ELSBURY — Elizabeth Street?

Prof. STEVENSON — In the CBD it is very difficult. There are other technologies like radar that can get around some of that as well. ITS can be used for an array of strategies, not just the road safety, so with traffic management as you are highlighting, variable speed notification and everything else is key to that, particularly on the freeway networks.

Assoc. Prof. NEWSTEAD — I think it is an important point, though; the reliability of the systems is going to be critical to their acceptability and their effectiveness.

The CHAIR — In parallel with that, what ITS technologies are used in Victoria?

Prof. STEVENSON — Many late-model vehicles have an array of technologies, whether it is ITS or ISA.

Assoc. Prof. NEWSTEAD — I think with ISA, while it is certainly not mandated, a lot of people have it as a functionality as part of GPS units. It is really hard to actually answer that question, because some of them are self-adopt technologies, like ISA, which you can put in your car yourself and no-one knows it exists there. That is often the problem we have with evaluating the effectiveness of vehicle safety technologies like that: unless we have good information through the register of what is actually fitted, we actually have no idea what is out there. Again that comes back to the data issues of what is there and what we can get out of it, but unfortunately with aftermarket stuff like an ISA-capable GPS unit, which you can take in and out of the car, it is very difficult.

Obviously, Monash has been involved in a trial of ISA for recidivist speeders that VicRoads has been running, and the results of that look very positive, and so the idea of potentially mandating these things in the future, I think, has some potential. Again, it might come down to the cost-benefit issue.

Prof. STEVENSON — We have been talking to the New South Wales government about opportunities as well about vehicle-to-vehicle and vehicle-to-infrastructure-type large city-wide deployments and so on.

The CHAIR — The work with the recidivists, is that part of a court order as such?

Assoc. Prof. NEWSTEAD — No, it is a trial VicRoads has been running, which is looking at the benefit of ISA for recidivist speeders and those people who have many speeding fines and are on their last few points, if you like, to see if this can assist them in compliance. They have been looking at the effectiveness of that, and we have been involved in that evaluation. The idea of trialling the technology is certainly — —

The CHAIR — How many people in the trial?

Assoc. Prof. NEWSTEAD — That is a good question. There were about 100 people in the ISA trial. That is enough to get some good results, though. The good thing about ISA is if you leave it in a car for a good length of time, you can actually get quite a lot of data and a good indication of how it is going to work.

The CHAIR — Good. Thank you. Do you think that the broad adoption of ITS technologies working as an integrated system should be viewed as a paradigm shift in road safety? For example, would vehicles fitted with speed limiters or ISA that prevent the vehicle from exceeding the speed limit remove the need for cameras or police enforcement?

Assoc. Prof. NEWSTEAD — Absolutely, with the proviso that it worked faultlessly 100 per cent of the time and was not able to be disconnected. We have seen truck speed limiters and the trucks sailing past you at

120 kilometres an hour with the speed limiter disconnected, because we know the truck drivers know how to do it. I do not think there will ever be a total lack of need for enforcement, but I think it will bring it closer to a system where people can be compliant without having to consciously be compliant, if you like, and maybe that is the benefit of it.

Prof. STEVENSON — The semiautonomous systems are pretty much there now in the latest vehicles and so on. So, you know, we are talking 10 years down the track; you will certainly be able to see a huge paradigm shift in some of these. But not yet.

Assoc. Prof. NEWSTEAD — But not yet; not for a while. Ultimately, yes.

Mr LANGUILLER — Just a counterpoint in relation to relinquishing total control — the driver having total control over it.

Prof. STEVENSON — The autonomous bit.

Mr LANGUILLER — Yes. What are your thoughts on that and what research is there? I imagine that would surely have to be a question that we need to ask of ourselves. Are there any risks in terms of safety?

Assoc. Prof. NEWSTEAD — I think the big issue that comes up in this context is liability. If someone else is taking control of your vehicle with you in it, who is liable? This is where a lot of the vehicle manufacturers have in fact struggled with some of the new semiautonomous technology, like autonomous braking: 'How far do we control your vehicle and take it out of your hands?'. A lot of them back off from that nth degree of control because they do not want to be liable ultimately for what might happen. You will have a lane departure system that will steer the car gently back in for you, but if you want to steer out, it will let you do it — in front of an oncoming truck.

Prof. STEVENSON — It is a continuum in terms of where we are at with the systems, from where we are now to totally autonomous. The time period for us going from A to B is not clear, but what is clear is that we are moving in that direction and we are behind in terms of regulatory issues around litigation and everything else. We are not preparing ourselves for that, because the move into the ITS where the vehicles are communicating with each other, even if it is warning systems and so on, potentially could be just a few years off in terms of citywide deployment. A whole city has to be on top of that. We have to know what the regulatory requirements are for that. What if the warning system did fail and it did not alert them that a car is flying through that intersection and did not alert them to brake sooner than they did — all those sorts of issues. We have not done any work in that area whatsoever.

Mr LANGUILLER — As you may remember, through the Chair, in the previous inquiry motorcyclists did submit that speed in itself could on occasions be a safety measure for them.

Assoc. Prof. NEWSTEAD — I would like to see the research evidence to support that.

Mr LANGUILLER — Sure. Fair enough.

Assoc. Prof. NEWSTEAD — That gets back to the point that you have to consider the legislative and liability framework that these things operate in, and it is not going to be a very straightforward exercise. As I said, the manufacturers themselves when introducing these technologies make their own calls and say, 'No, we're going to back off'. Ultimately it is your decision what happens in the final outcome.

Prof. STEVENSON — Although in terms of an ITS regulatory framework for the vehicle manufacturers, there is harmony there. I cannot recall, but I think it is 2015, possibly 2016, where there will be harmony across all their systems in relation to ITS.

Assoc. Prof. NEWSTEAD — There will be, but the extent to which they operate I think will vary. For example, Mercedes have a fully autonomous braking system which will stop your car in the event of it detecting an imminent forward collision. The new Holden could have that technology, but it only goes as far as a collision warning system; they have taken a different tack. Mercedes have one view of their responsibility and General Motors have a different view of their responsibility, and I think that is the sort of thing we are going to grapple with over time.

Mr LANGUILLER — What about Volvo? Do you know?

Assoc. Prof. NEWSTEAD — They obviously have their City Safety system, but so far they do not have a system that works above 30 kilometres an hour, which is probably the one that is going to produce the most benefit for us. We saw the spectacular failure of the Volvo system in its testing regime early on, where for some reason the system failed during the demonstration and it went straight into the back of a truck at 30 kilometres an hour in front of the world media. It is a great YouTube watch.

The CHAIR — What is the reference?

Mr ELSBURY — We will look it up, don't worry! Just going back a little, you were talking about the TAC commercials and the fact that people form an emotional connection to them. They tend to be rather graphic. We have had other submitters say that perhaps another tack needs to be taken somewhat similar to the Metro Trains Melbourne *Dumb Ways to Die* commercial or even the Yarra Trams warning that a tram is the equivalent weight of 20 rhinoceroses, being a different way of getting through to a generation that possibly does not care about personal safety. They are more about what is funny and what is going to trend on YouTube. What is your opinion of that sort of thinking?

Assoc. Prof. NEWSTEAD — I think we have to be very careful to differentiate brand awareness with behavioural change, because if you use the traditional marketing approaches of creating brand awareness, you may achieve no behavioural change at all. If you take a light-hearted, informative attitude to these things in terms of road safety, I think it often misses people's ability to change their perception of the consequence. I think the research evidence we have is not extensive, I would say, but it is enough to indicate that an emotive approach where you can potentially feel the grief that might be involved in that situation seems to have a much better connect with the population than something that merely informs about something they do not care about.

Mr ELSBURY — Talking about Metro Trains and coming a little bit out of left field, what role do you think public transport would play in reducing road trauma over the long term?

Prof. STEVENSON — I am just working on some modelling at the moment for Melbourne looking at land use, transport and health, and clearly the key drivers of the model are the risks associated with various forms of transport mode. The more vulnerable you become obviously the more risk associated with injury and other areas. Public transport is clearly a lower risk than a cyclist, for example, so there is some benefit there. But the benefit potentially as well is that with public transport you are getting some degree of active transport as well. As long as the environment is safe for them to be actively commuting in it, you will get some great benefits in terms of health outcomes other than just road trauma in terms of injury and death. Overall and globally I think there has been a quite significant push to other forms of transport, other than individual motorised transport, for public health gains, particularly in terms of emission reductions, congestion, productivity and a whole other array of outcomes.

Assoc. Prof. NEWSTEAD — I think it potentially has quite a large role to play. The challenge in a city like Melbourne is always the issue of the cost-benefit of providing it versus other modes of transport and how you can get people to adopt it. I think it is an immense challenge for a city as spread out as Melbourne to actually achieve those modal shifts while acknowledging the lifestyle imperatives of the people who live in the city. It is a big challenge. I think it could play a big role, but how you actually do it in a way that is cost-effective compared with other things you might do to improve safety is probably something that needs to be looked into quite carefully.

The CHAIR — The bus is about to depart. We have one more question.

Mr PERERA — Your submission focuses in part on safer speeds as a countermeasure. While recognising the potential safety benefits of reduced speed, how do you respond to the argument that these benefits need to be balanced with others such as reduced travel time? For example, a lot of my constituents have complained that on the south-eastern freeway, coming from the city, you do not get to go at 100 kilometres an hour until Burke Road. They reckon it should be 100 a long time before Burke Road.

Assoc. Prof. NEWSTEAD — I think it is quite interesting. There have been a number of studies that have looked at mobility benefits. This is always a problem with how mobility is valued in the system and how it competes with how safety is valued, which is one of the arguments of going to a willingness-to-pay system

because it probably balances against people's mobility requirements quite a lot. But I think we need to be quite distinguishing of metropolitan Melbourne travel times versus regional travel times, because study after study has shown that speed limit reductions in metropolitan Melbourne make very little difference to travel time, given the average travel speed is something in the order of about 27 kilometres an hour now and most of our speed limits are not 25 kilometres an hour, let's say. I think those arguments are a bit glib in metropolitan Melbourne, because I think the evidence suggests that there are not really many travel time penalties. In fact if you were driving up the Monash Freeway this morning you would have been happy to have been doing 80 kilometres an hour once you got to Burke Road, because you would not have been.

Prof. STEVENSON — Even on rural roads potentially it is very minor. I smiled at it, because before Adam Giles, the Chief Minister in the Northern Territory, came in as Chief Minister, he was just so vocal on open speed limits in the territory, the key point being that you need to get from A to B in the fastest time possible and that was the safest. That was his road safety policy in essence. The work that people have done in the territory to look at that and counter that sort of argument shows that in terms of changing the speed what you are talking about is negligible. In this instance the open road was changed to 130 kilometres. There is not much in it.

Assoc. Prof. NEWSTEAD — There might be instances where, if you were actually to adopt the safe system principle in its absolute form, you might find you are putting speed limits of 50 kilometres an hour on the Western Highway, for example, where there is no wire-rope barrier. In those instances I think there might be a conflict. But I agree, I think the instances where that is a real conflict and is going to vastly affect travel times are relatively small, but certainly in rural areas we need to continue to focus on providing a safe system that can support the sorts of speeds that are required for mobility. I do not think that in metropolitan Melbourne it is a very valid argument.

The CHAIR — All right. The bus is due to leave shortly. There is a photograph to be taken before we go. On behalf of the Victorian parliamentary Road Safety Committee, I would like to thank you both very much for attending, Professor Stevenson and Associate Professor Newstead. Your information will be very helpful to our inquiry.

Prof. STEVENSON — Thank you.

Assoc. Prof. NEWSTEAD — It was a pleasure.

Committee adjourned.