

Dmitry Medvedev and a series of panel sessions on partnerships, policy, health sector contributions, safe road users, safe road infrastructure, safe vehicles, improving data; where around 40 different speakers outlined solutions.

## An International Tragedy

The overall picture drawn to the 1500 delegates from around the world (including three from Australia) was of the relatively unnoticed international tragedy with 1.3 million deaths and millions of injuries per annum from road crashes. Passionate ministers emphasised the tragedy is rapidly increasing; currently road crashes are the largest cause of premature death for young people and described by many as an epidemic. The costs to GDP were recognised at 2-4 % in many countries (equivalent or higher than the current Global Financial Crisis) and that 50% of trauma beds in hospitals are filled with road crash victims.

Many speakers said that unlike the climate change issue, road safety solutions are predictable. We understand and agree on the problems, and the antidotes and solutions are well known. The call for a Decade of International Action on Road Safety to reduce fatalities by 5 million began with identification of the seriousness of the problem over a decade ago and over that time many governments, agencies and specialists had worked to build workable solutions.

There were offers of financial support for improving road safety in developing countries; the Bloomberg Foundation has offered \$US125m to help road safety programs in 10 countries. The Secretary of State for Transport in the USA said that the US House of Representatives had already agreed to support the call for the Decade of Action.

Australia has yet to decide what it will do. Australia has a tradition of taking positive steps internationally in a range of policy areas, and we have a history of political leaders offering

policy leadership positions based on our own particular experiences.

The Moscow meeting was a watershed in bring together senior world leaders who not only recognised the need to reduce unnecessary road trauma in the developing world, but who could see that working together could help reduce road trauma in all countries.



*The ACRS President, Lauchlan McIntosh with Mr. Hiroshi Goto from the National Association for Victims Aid in Tokyo (who run Japan NCAP) and Professor Claes Tingvale, the Chairman of EuroNCAP at the Moscow Conference*

Australia will be asked to support the Moscow Declaration for a Decade of Action for Road Safety in March 2009. Our community should demand that our politicians become as passionate as some of the Ministers in Moscow. We need to encourage them to take the leadership role both in the developing world and in Australia. We need in Australia an independent review of why we have failed our road safety targets, we need to know why some States have better results than others, and we need to be committed to all working together to really make a difference. No one should die or be injured unnecessarily in road crashes.

## Recent Progress in Implementing the Safe System Approach

*By Blair Turner, Peter Cairney, Chris Jurewicz & David McTiernan ARRB*

### The Safe System Vision

The Safe System approach has now been adopted by each jurisdiction within Australia, and is likely to be at the core of the new national road safety strategy.

Based primarily on the Swedish 'Vision Zero', and the Dutch 'Sustainable Safety' approaches, the Safe System approach recognises that humans as road users are fallible and will make mistakes. There are also limits to the kinetic energy exchange which humans can tolerate (e.g. during the rapid deceleration associated with a crash) before serious injury or death occurs.

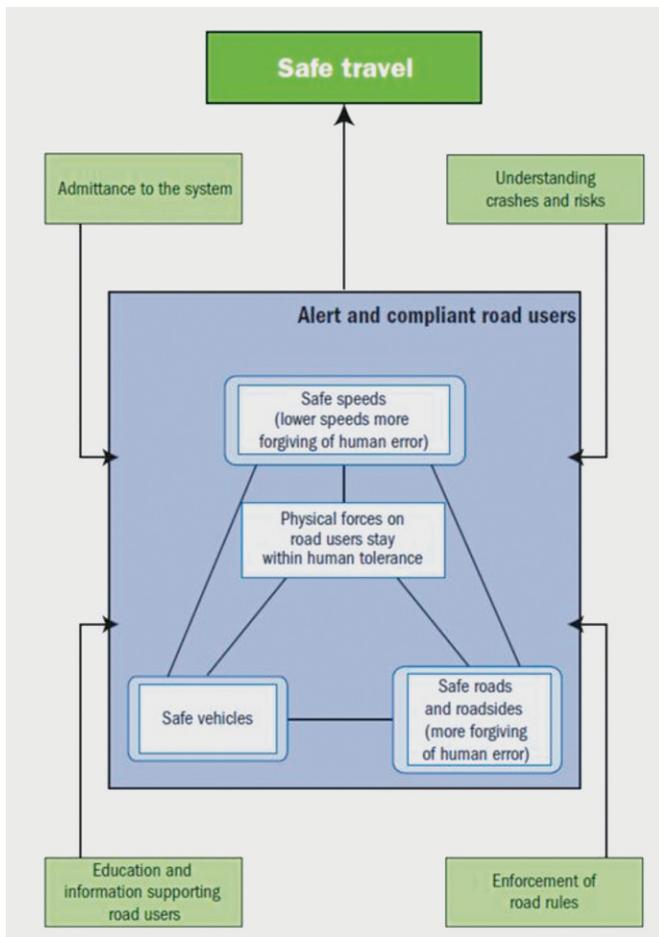
A key part of the Safe System approach requires that infrastructure be designed and managed to take account of these errors and vulnerabilities so that road users are able to avoid serious injury or death on the road.

Although the Safe System vision is clear within Australia, and there is general agreement about this, the approaches that might be taken to achieve this vision are less obvious. Advice is required regarding infrastructure options for achieving Safe System outcomes; on appropriate speed management strategies; and on ways to maximise the alertness and compliance of road users.

In order to help understand how jurisdictions can meet these objectives, ARRB has facilitated a series of national workshops to discuss these issues.

### Infrastructure Options

A national forum was held to examine infrastructure options that might help achieve Safe System outcomes. The forum involved around 40 senior road managers from Australia and New Zealand. Discussion included current progress towards implementing Safe System principles, and options for future implementation. Some of the outcomes from the event are discussed below, while full details can be found in Turner et al (2009) [1].



It was recognised that the successful management of vehicle speeds is a critical element of the Safe System approach. Recognition of the human tolerances to impact forces at different speeds and in different road environments provides useful direction for future infrastructure improvement. As an example, it is recognised that above impact speeds of 50 km/h the chances of surviving a side impact collision at an intersection begin to reduce dramatically. This implies a need to reduce speeds to 50 km/h in situations where intersection conflicts are likely. This can be achieved through the installation of well designed roundabouts, or the use of platforms at intersections. For situations where higher speeds through intersections are required (i.e. on high

speed major routes), consideration should be given to grade separation or the banning of specific turn movements and provision of acceleration and deceleration lanes.



A useful distinction was made between ‘Primary’ and ‘Supportive’ road safety treatments. Primary treatments are those that directly provide a Safe System outcome (i.e. minimise death and serious injury), for example by reducing impact forces to safe levels or by separating different road users. Supportive treatments assist in delivering safety improvements, but in an indirect manner (e.g. hazard warning signs may reduce the incidence of crash occurrence, but should a crash occur, would not have an influence on the severity outcome). Both are beneficial, but more use needs to be made of Primary treatments. In addition efforts are required to develop new Primary treatments. Continuing the intersection example provided above, there is a need to explore the use of raised platforms at signalised intersections, or ways to slow vehicles on the approach to intersections, perhaps through increased deflection and / or road narrowing. Work is currently underway in Australia and elsewhere to explore these sorts of possibilities.



Additional work is not only required to identify and implement Safe System infrastructure for intersections, but also for other situations where fatal and serious injuries are likely to occur. Of particular interest are measures to provide a forgiving roadside environment (for example through removal or relocation of roadside hazards, the use of crash friendly roadside features and barrier systems), measures that prevent head-on crashes (particularly barrier systems), and measures that protect vulnerable road users (including physical separation and slower speed environments).

It was identified that good progress is being made towards Safe System implementation in Australia, but there is a need to share good practice between jurisdictions more effectively. The report from the forum [1] is expected to form the basis for further discussions on the implementation of Safe System infrastructure, and to inform delivery strategies at local, state and national level.

## Speed Management

A similar workshop was held to discuss speed management policy in light of the Safe System approach. This was held as part of an Austroads project on speed management. A key aim of this workshop was to reconcile the gap between Safe System outcomes (a 'must' have) and mobility (a 'should' have).

As a starting point this workshop considered the safe speeds that apply to different crash situations based on human biomechanical tolerances. These tolerances are derived from the impact speeds above which the chance of survival begins to rapidly decrease. For collisions involving pedestrians, this speed is 30 km/h; for collisions involving a side impact with a roadside object it is 40 km/h; for side impacts at intersections it is 50 km/h; and for head-on crashes it is 70 km/h (see Jurewicz & Turner in press [2] for a further discussion of these tolerances).

A key outcome from this workshop was the recognition that it is often the case that drivers are not able to brake prior to the occurrence of a crash because there is no warning. For instance, a pedestrian may step out from behind a parked vehicle and be struck by a vehicle before any braking can occur. In this case, the impact speed will be equal to the driving speed. Based on this assumption, the safe speeds presented above also represent the safe speed limits for these types of environments (e.g. 30 km/h where there are likely to be pedestrians).

Through this Austroads project a Safe System Analysis method was developed to match the speed limit to the level of road user protection offered by existing road infrastructure, or to recommend infrastructure improvements to retain a higher speed limit if this is the required function of the road. Further details of this process can be found in Jurewicz & Turner in press [2].

## Road User Behaviour

A third workshop was held late in 2009, with the objective of discussing Safe System and how it applies to road user behaviour. Key points of discussion from this event included how we define an 'alert and compliant' road user. It was recognised that this is a complex issue, and that it is difficult to define these terms. Nevertheless, there was consensus that non-alert and non-compliant users should be catered for when designing a Safe System, although there is a limit to the extent that extreme driving behaviour can be accommodated through vehicle and infrastructure design.

There was agreement that education programs are not effective in reducing death and injury directly, but that these are necessary for building a climate of opinion where vigorous action to improve

safety can be pursued. In this, the workshop participants identified that a gap currently exists in the marketing of road safety to the community and, as provided in the Safe System approach, the responsibilities of road users to be alert and compliant to operate within the parameters of the system. It is considered that achieving further gains in road safety will require a more effective engagement with the community both to secure appropriate behaviours on the road and to understand the reasons for infrastructure decisions such as the selection of speed limits that suit the prevailing road conditions and environment.

Other key issues discussed were the identification of performance indicators for measuring progress towards Safe System outcomes. Examples of existing measures included the proportion of motorists who were above the legal blood/alcohol level or who were not wearing seatbelts. New indicators included the need to measure consumer purchasing patterns when buying vehicles, and consumer demand for information about safety.

The results of this third workshop were still being assessed at the time this paper was being produced, but it is anticipated that a report will be released detailing the discussion in the near future.

## The Challenge

The Safe System framework has been adopted as a way to make substantial future improvements to road safety in Australia. The vision appears clear, and appropriate steps to achieving Safe System outcomes are now being developed. The next challenge will be to ensure that the vision, as well as the steps required to achieve this are firmly embedded within policy at the national, state and local level. This is a substantial task and will involve extensive education programs and monitoring. It will also involve a large investment in infrastructure, vehicle improvements and the selling of road safety to the community over a sustained period. However, given the annual cost of crashes in Australia, the cost of not taking appropriate action is likely to be even greater.

## References

- 1) Turner, B Tziotis, M, Cairney, P & Jurewicz, C 2009, Safe System Infrastructure National Roundtable. Report ARR 370. ARRB Group, Vermont South, Australia.
- 2) Jurewicz, C & Turner, B in press, Infrastructure/Speed Limit Relationship in Relation to Road Safety Outcomes. Austroads, Sydney, Australia.