# Bertil ALDMAN Award Lecture

This 20th Bertil Aldman Award Lecture is a slight departure from our customary lectures on injury biomechanics and road safety. Previous lectures since 1993 have provided state-of-the-art reviews of specific research topics such as injury mechanisms and tolerance, occupant protection, the role of field crash injury data and computational modelling in the laboratory. This year's lecture focuses on the transformation of research findings into national and global public policy and action plans through science-based programmes such as New Car Assessment Programmes (NCAP) and safety regulations. While research continues to be vital, the application of research findings in the real world and the political will to do so are equally essential. We welcome this contribution to the IRCOBI Conference Proceedings.

*Prof. Jeff Crandall*
*IRCOBI President*

**From Research to Global Policy and Action**

David Ward

Director General of the FIA Foundation

I am very grateful and honoured to be invited to give the 2012 Bertil Aldman Award Lecture. Bertil Aldman's contribution to vehicle safety on a daily basis saves the lives of many people who will have never heard of him. Parents relieved that their child is safe in a rear-facing child restraint or drivers grateful for the life-saving power of three point seat belts owe a lot to Bertil Aldman and his colleagues in automotive safety research. That includes this speaker. I survived a serious crash in 1974 as a passenger in a Mini only because I was wearing my three point seat belt. So I count myself as another beneficiary of the vital work of road safety engineers like Bertil Aldman.

Last year the United Nations declared a Decade of Action for Road Safety. This initiative is a long overdue recognition of the appallingly high level of death and injury on the world's roads. For too long road safety has been off the radar screen of global public policy; a 'Cinderella subject' uninvited to the ball, or rather not included in the United Nations' agenda for international co-operation. Consider, for example, the Millennium Development Goals that have been a central focus of the global development effort since 2000. They completely ignored road crashes even though they kill more than 3,000 people every day, a level higher than major communicable diseases like TB and malaria which are included in the MDGs.

Fortunately today this serious oversight has been overcome. After a long advocacy campaign, in which the FIA Foundation has been privileged to play a leading role, the international community has finally recognised the urgent need to tackle the global epidemic of road crash injury. This has been ranked by the US Centers for Disease Control and Prevention as one of the last decade's "ten great public health achievements worldwide".

Getting this recognition has required a series of road safety firsts. In the last ten years we have seen the *first ever* UN General Assembly resolution on road safety in 2003. Then the Assembly's *first ever* road safety debate in 2004. This was linked to the *first ever* World Health Day in April that year devoted to road safety, which coincided with release of the World Report on Road Injury Prevention, the *first ever* assessment of the global scale of road injury. Then in 2007 we had the *first ever* Global Road Safety Week, followed in 2009 by the *first ever* Global Ministerial Conference on Road Safety. The Moscow Ministerial gave its support to the *first ever* Decade of Action which was mandated by the UN General Assembly in 2010. This included a *first ever* global target to reduce and then stabilise the forecast level of road deaths by 2020. If that is achieved, the Decade will avoid 5 million deaths and fifty million injuries saving more than $3 trillion.

A major player in this unprecedented effort in road safety diplomacy has been the Independent Commission for Global Road Safety, chaired by Lord Robertson of Port Ellen and for which I serve as Executive Secretary. Building on the analysis of the World Report, the Commission issued its own 'Make Roads Safe' report in 2006. This made explicitly political demands of the international community calling for road safety to be recognised as a development issue, for a $300 million ten year action plan and for a Ministerial Conference. In 2009, having successfully lobbied for the Ministerial meeting, the Commission then issued another report calling for a Decade of Action and repeating its call for road safety to be integrated into the UN Development Agenda.

Now, I'm delighted to say that both these demands have been met. The UN Decade was successfully launched last year and road safety has been included, for the first time ever, in the final communiqué of the Summit on Sustainable Development held in Rio de Janeiro this June. Another important result of the Rio Summit is that it opens a process of international negotiation on Sustainable Development Goals which will replace the MDGs once their original 2015 timeframe is completed. It is expected that an SDG for sustainable transport will be agreed by 2015 which will include road safety and give significant impetus to the Decade of Action at its mid-point.

Do any of these UN initiatives really matter? Aren't they just words and global development 'speak'? Oftentimes resolutions and communiqués are just words but consequences follow from them. When road safety was left out of the MDGs, it fell down the priority list of governments and international organisations alike. Since 2000 the World Bank, UN agencies, bilateral donors and major philanthropies like the Gates Foundation have concentrated resources on the specific targets of the MDGs. Road injury prevention programmes, as a consequence, have lost out. Today despite the best efforts of the Bloomberg Philanthropy and the FIA Foundation, global road safety still remains seriously underfunded.

Post Rio, at least now there is a clear mandate, and despite the harsh economic environment, a better chance than before that road safety will be able to claim higher levels of investment. Indeed in Rio, the World Bank and seven regional development banks announced a commitment to sustainable transport based on expected expenditure over the next decade of $175 billion. This is for transport as a whole but road transport and road safety feature prominently in their commitment statement. So UN words matter because they can and should translate into more resources for road safety.

UN words matter also because we now have a coherent global plan for effective road injury prevention. The United Nation's Road Safety Collaboration (which brings together UN agencies, development banks, civil society and the private sector) has prepared a Global Plan for the Decade that promotes safer roads and mobility, safer vehicles, safer road users, post-crash response and capacity building. Based on the pioneering work of William Haddon, influenced by the Swedish Vision Zero concept and building on the recommendations of the World Report, the Global Plan promotes the 'safe systems' approach. Thus it should now be easier than ever before for UN member states to develop effective road injury prevention programmes.

All this is very timely and relevant because at this moment humanity is conducting an unprecedented experiment with the automobile. It took one hundred years for the vehicle fleet to reach 1 billion and we are now trying to double that in ten years. The relentless rise in popularity of the car shows no sign of slowing down at all. The history of the automobile now crosses three centuries; invented in the 19$^{th}$, matured in the 20$^{th}$ and becoming fully globalised in the 21$^{st}$. Although the industrialised countries now have mature vehicle markets with low annual growth rates, the emerging economies of the BRICs and beyond are motorising spectacularly fast. The growing global middle class, especially in Asia, are fuelling demand for more and more cars. Indeed that region now has the world's largest share of both production and sales of motor vehicles.

The challenge for the Decade of Action is to try to minimise the negative safety consequences of this explosive increase in automobiles. This will require sustained action across all five pillars of the Decade Plan. We need safer road users, in safer vehicles, on safer roads, managed by authorities with the capacity and responsibility to develop and maintain mobility networks that are designed to be safe. Of course this is far easier said than done. I would argue that the biggest challenge of all is to encourage integrated action across all five pillars simultaneously. Even the best performing

industrialised countries rarely manage to achieve such a high level of co-ordination among their responsible road safety agencies.

Given inevitable resource constraints and competing priorities, it will be hard for low and middle income countries to implement all the recommendations of the Global Plan. They will need both strong political commitment and sustained investment. That is why the Decade of Action is a unique opportunity to act as a powerful catalyst for both. However, it can also try to harness trends and investments that are going to happen anyway to maximise their road safety potential. This is particularly important when it comes to road infrastructure and vehicle safety.

Across many emerging economies new road infrastructure investment and road rehabilitation is increasing substantially. Every new kilometre of road is an opportunity to design and build for safety. Unfortunately far too frequently this opportunity is squandered. Often the key performance indicators for a road project focus on raising levels of speed linked with presumed transport efficiency for vehicles rather than on reduction of injury risk for all road users, especially pedestrians. Time and again road projects make this basic mistake and regrettably development banks are complicit in this systematic neglect of road safety. Last year the Commission for Global Road Safety published a third report 'Time for Action' in which it highlighted worrying examples of World Bank funded projects in Bangladesh and Kenya. In both cases multi-million dollar investments led to higher levels of road fatalities than before the 'road improvements' were completed.

At the time of the Moscow Ministerial in 2009 all the major multilateral development banks launched a new Joint MDB Road Safety Initiative. This aims to scale up their combined safety efforts and adopt common approaches to their road injury prevention programmes. These pledges were repeated in their recent Rio joint statement. It is now urgent that these commitments are put into practice. The International Road Assessment Programme (iRAP) has been carrying out innovative road star rating projects that I believe should be used by the MDBs to raise the levels of safety of their road investments. It should be an operational requirement, for example, that all road projects supported by the banks meet, at a minimum, the 3 star iRAP standard. If such quality assurance was built into road investments at the outset, then safety performance will improve automatically with each new kilometre of road.

The same kind of automaticity could occur by improving the safety of the global vehicle fleet. Nearly half of global road fatalities are vehicle occupants. So improved vehicle safety is rightly included as one of the pillars of the Global Plan. Given the extraordinary doubling of the vehicle fleet now happening, there is a great opportunity to scale up the safety levels of new cars entering world markets. Surely all of them should at least meet minimum international safety standards. At present unfortunately this is not the case.

Look, for example, at the situation in Latin America where a new independent consumer crash test programme has been running since 2010. The Latin New Car Assessment Programme has tested most of the region's top selling brands. All of them revealed levels of safety about twenty years behind Europe or North America. The cars were not equipped with air bags and showed weak body shell integrity resulting in 'one star' ratings with a high risk of serious injury. The models were tested at 64 kph in the 40% offset deformable frontal impact test that is commonly used by Euro NCAP. It is almost certain also that same models tested would fail to meet the United Nations regulation for frontal impact (ECE 94) which uses the same procedure but at a lower speed of 56 kph.

All the global manufacturers involved are fully aware of the ECE regulation 94 and build models that comfortably exceed its requirements in the automotive markets of the industrialised countries. The regulation originated in the European Union and has been compulsory there in all new models since 1998. It has now penetrated through almost the entire 200 million plus EU vehicle fleet. This passive

safety innovation has certainly contributed significantly to the reduced level of fatalities experienced across the EU over the last ten years which overall have declined by 43%. In the UK the Transport Research Laboratory has estimated that if a car registered in 2004–2007 (post ECE 94) is involved in a crash, the expected number of drivers killed is 30% less than if a car registered in 1988–1991 (pre ECE 94) was involved.

So why has Latin America missed out on this seemingly straightforward opportunity to improve the level of safety of its passenger cars? The answer is lack of regulation, non-participation in the UN's regulatory system, lack of consumer awareness and a car industry unwilling to make improvements until forced to do so. This explains why a country like Brazil which is now the world's sixth largest automobile producer and the fourth largest market is trapped in a level of vehicle safety far below its potential, with a death rate of 18.9 per 100,000 population.

I would argue that in response to the Decade of Action the car makers now need to step up their often stated commitment to global harmonisation. The market leader in Brazil is Fiat S.p.A. and its Chairman Mr Sergio Marchionne is also President of the European Automobile Manufacturers Association. Earlier this year Mr Marchionne was interviewed in the magazine of the International Organisation for Standards. He was asked about their importance and replied: "We do need standards; the world needs standards. Standards help an enterprise manage business critical issues such as quality, environmental performance and safety". Well, apparently not yet in Brazil…

Fortunately the Brazilian government is now taking action and airbags will be mandated from 2014. The arrival of Latin NCAP is also sparking debate about vehicle safety and pushing manufacturers to offer better products. The most important step that a country like Brazil can take now is to join the UN's Forum for Harmonisation of Vehicle Regulations (UNECE WP29) and sign up to the standards for both front and side impact. Increasingly that is what I expect many middle income countries will do, especially those with an interest in vehicle production. Malaysia, for example, is participating in UNECE WP29 and has just adopted ECE 94. This is a trend that needs to be encouraged and is exactly in line with recommended activities in the Global Plan for the Decade.

Unfortunately, governments are sometimes reluctant to follow Malaysia's excellent example because they are fearful that ensuring that all new cars meet ECE 94 will be too expensive. Industry frequently encourages this by asking for delays and long lead times. In reality it requires just one driver side air bag to pass ECE 94 together with some body shell improvements. These are not expensive changes. Unit costs of air bags have fallen by 60% over the last fifteen years and will fall further as the global market expands. The increasing use of common global platforms by the car makers also reduces production costs. A study by AT Kearney has estimated that global platforms offered savings of as much as $900 per unit. That is why it is increasingly untenable for the industry to raise cost issues as a reason not to meet minimum global safety standards.

Indeed I believe that the aim now should be to accelerate penetration of the ECE 94 regulation through the car fleet so that it reaches a global level of 100% by the end of the decade. The same should happen as regards ECE 95 for side impact. Everything possible should also be done to encourage the widest possible usage of electronic stability control (ESC). This anti-skid crash avoidance technology has become mandatory across all the major industrialised countries this year as the evidence shows clearly that ESC is the most important safety device since the seat belt. Since 2008 there is a global regulation for ESC so again it is administratively easy for countries to adopt a rule requiring its mandatory fitment.

These vehicle safety measures will, of course, still leave much more to be done. Vulnerable road users, such as pedestrians, motorcyclists and cyclists remain a key focus for action, especially in

developing countries where they still often dominate the landscape of road transport and usually account for the majority of road traffic injuries. For these reasons, the Decade of Action emphasizes the needs of vulnerable road users, especially children. Next year from May 6th there will be a second global road safety week and its key theme will be pedestrian safety. This will be an important opportunity to highlight the range of measures from infrastructure design, speed enforcement and relevant vehicle measures that can reduce the risks associated with our most traditional form of mobility, walking.

That said, there is still a significant urgency to improving vehicle safety now. Last year 60 million new passenger vehicles were built worldwide, a record number despite the problems in the global economy. However, as many as 20 million of these new cars are unlikely to meet the UN's minimum crash test standards. This short-sighted 'business as usual' approach has a significant opportunity cost. Each car failing to meet these safety requirements may remain on the road with successive owners for perhaps another twenty or even thirty years. And each of these cars will unnecessarily expose their occupants to an extended period of high risk of serious injury in a crash.

This would be avoided if all UN Member States take the opportunity of the Decade of Action to legislate now for safer cars. The necessary regulations, such as ECE 94 & 95, are available for adoption immediately by all major car-producing nations through the UNECE WP29 process. These standards could also be used by importing countries to control the quality of second hand cars being introduced into their market. At a stroke we would then begin to see the end of the 'one star' vehicles or less that still dominate the markets of Africa, Asia, and Latin America.

Failing that, perhaps all new cars that cannot pass the UN crash tests should be required to display a large 'death trap' warning label with a skull and cross bones! This slightly tongue in cheek suggestion brings me to the important role of consumer information.

Alongside regulation, consumer awareness has served as a powerful catalyst for improved vehicle safety. In 1978 the US National Highway Traffic Safety Administration launched the first ever New Car Assessment Programme. This was followed by similar initiatives in Japan, Australia and the European Union. The NCAPs have proved highly effective in raising the awareness of consumers of the choices they face when buying a new car. They have also exposed the weaker products of car makers and rewarded those that achieve the coveted five star rating. Now NCAPs are being launched in the rapidly motorising regions and there is every reason to expect that they will be similarly successful in creating a 'market for safety' as they have been in the industrialised countries.

Last year the FIA Foundation was pleased to help launch Global NCAP which aims to support NCAPs in emerging regions and act as a platform for the exchange of best practice between them and the existing programmes active around the world. This is fully consistent with the Global Plan for the Decade which specifically recommends development of NCAPs. I am pleased to say that this policy has also been backed by the UN Secretary General, Mr Ban Ki-moon and endorsed in a further resolution on road safety adopted by the UN General Assembly in April.

Today there are nine NCAP-type organisations active in Asia, Australia, Europe, Latin America, Japan and North America. In May this year they all participated in Global NCAP's inaugural annual meeting in Melaka, Malaysia. The event saw the launch of both the ASEAN NCAP and a crash test laboratory run by the Malaysian Institute for Road Safety Research.

As I mentioned earlier, the Malaysian Government has just legislated for ECE 94 and so is following exactly the path recommended in the Vehicle Pillar of the Global Plan of the Decade. They are combining regulation with consumer information and dynamically integrating vehicle safety with

other actions in the related pillars. Seeing this first hand in Malaysia in May was immensely rewarding. It makes all the effort in lobbying for the Decade worthwhile. It provides a wonderful example of a country responding positively to the challenges of rapid motorisation and rising road injury. Malaysia is showing us all how to transform the text of UN resolutions into real measures of injury prevention, a clear case of words into action.

It was also a great pleasure in Malaysia to be involved in the launch of an award scheme for Global NCAP. This year's winner for individual achievement was Joan Claybrook who in 1978 as NHTSA Administrator launched the first ever NCAP. At the ceremony Joan, who is a lawyer by profession, dedicated her award to the engineers and technicians with whom she had worked closely at NHTSA. Like Joan Claybrook, I am not an automotive engineer but rather a practitioner in global public policy. So like her I would like to conclude by paying tribute to the engineering community, typified by individuals like Bertil Aldman. Without his and your contribution all the fine words of the UN Decade of Action, particularly as regards safer vehicles, would come to nothing. So I would like to sincerely thank you for your commitment to road safety and the kind invitation to speak to you today.

*Selected References and Websites:*

[1] UN General Assembly Resolutions on Road Safety

[2] UNECE Regulations 94 and 95

[3] UNECE Working Party 29

[4] World Report on Road Injury Prevention
(http://www.who.int/violence_injury_prevention/publications/road)

[5] Commission on Global Road Safety 'Make Roads Safe' Report 2006 and 'Time for Action' 2011
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