



# RCAR

Research Council for Automobile Repairs

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# Newsletter

[www.rcar.org](http://www.rcar.org)

March 2003

## RCAR People

### KART – Korea

#### New Chief of KART

Dong Beom Lee was appointed as Chief of KART on 3 February 2003. He joined Korea Insurance Development Institute (KIDI) in 1984. In the period 1984 to date he has worked within KIDI and has filled a varied and progressive range of appointments. These appointments embraced automobile insurance, insurance statistics and information technology (IT).

Dong Beom Lee is 47 years of age and is very active. His pastimes includes golfing and mountaineering.

(KART is at: [www.kidi.co.kr](http://www.kidi.co.kr))



Dong Beom Lee

#### Special points of interest:

- News from 9 RCAR Centres.
- RCAR People.
- News Sources and Forthcoming Events.
- Global Priorities for Vehicle Safety

### Tech-Cor—USA

#### New Head of Centre



William G Cox

Bill joined Allstate in 1976 after several years in the Automobile Dealer Service Industry. His adjusting skills include Auto, Casualty and Homeowner claims. His local market management assignments included Auto, Casualty and Property responsibilities leading to management of the Claim Office. Regional Management assignments included overall Auto responsibility for several Claim Offices.

Subsequent to joining the Home Office Bill was a Director in Allstate's Procurement Governance organization where he led the team that was responsible for purchasing and vendor contracts involving Auto and Casualty claims.

Most recently, he was a member of the team responsible for the acquisition and integration of a network of Collision Repair facilities. His position as Director Claims Strategy includes management of the Tech-Cor Research and Collision Repair Center.

Bill is a Certified Purchasing Manager and achieved the Casualty Claim Law Associate designation. He has served on Inter-company Arbitration Forum panels in addition to being a Certified Quality Education System Trainer.

(Tech-Cor is at: [www.tech-cor.net](http://www.tech-cor.net))

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## RCAR People

### Thatcham - UK

There have been two significant management changes at Thatcham in recent months.

#### New Strategic Development Director



**Ken Roberts**

Ken Roberts, who is well known to RCAR Members and chairs the RCAR Steering Committee, has been appointed Strategic Development Director. To quote from the Press Release: “Ken has over 45 years’ experience in the Motor Industry and since 1982 he has undertaken various engineering roles at Thatcham. This contribution has ensured the growth of the centre into the world renowned research facility it is today. In his new role he will concentrate on driving future strategy and use his unrivalled knowledge of the industry to ensure Thatcham is positioned to continue its contribution to the reduction of insurers’ motor repair and claims costs. His new responsibilities will also cover longer term strategic development, high level corporate business progressions, liaison with vehicle manufacturers and overseas business opportunities. Commenting on this demanding new role Ken Roberts said: “Having this opportunity to influence Thatcham’s future strategy is an exciting responsibility which I welcome since it will fully utilise my industry experience in enhancing Thatcham’s worldwide reputation even further”.

#### New Head of Research

We also welcome Andrew Miller, who has been appointed Head of Research at Thatcham. Andrew is a graduate in Product Design from Coventry University with a career background in the Automotive Industry. He first worked in Body Engineering at Jaguar Cars and then moved to the Hawtal Whiting Consultancy where he was involved in Body Structure development. In 1991 Andrew went to Britax Sunroofs where he managed the Current Engineering and Special Projects function developing the UK’s first all plastic sunroof. He then moved into automotive market business development for a major polymer manufacturer specialising in fuel systems, and more recently served three years as Group Research Director for a major European fuel system supplier. He is married with three children two teenage boys and a younger daughter. His interests outside work include church activities and world history – particularly geopolitics, military and automotive development.



**Andrew Miller**

(Thatcham is at: [www.thatcham.org](http://www.thatcham.org))

## News From The Centres

### JKC – Japan

There has been a great deal of activity in Japan in recent years in respect of automobile theft. The trend as outlined in the 2001-2002 Fact Book showed the number of stolen automobiles increasing from 35,884 in 1998 to 63,275 in 2001. Recently in the Japan Non-Life Newsletter (January 2003) stolen automobiles for 2002 were revealed at 62,673 – a slight reduction. JKC believes that the recent trend of rapidly increasing numbers of stolen automobiles has been halted. This has been accomplished by a great deal of effort by the Government and private organisations.

One major factor in bringing the rapid escalation in automobile theft under control is the fitting of immobilisers by automobile manufacturers. Last year The Marine and Fire Insurance Association of Japan analysed the effect of fitting immobilisers on insurance claims. The result of the analysis showed that theft of some cars reduced dramatically after adopting engine immobilisers. Today automobile manufacturers are finally beginning to fit immobilisers more widely on new cars released into the Japanese market. JKC believe that the widespread adoption of engine immobilisation will bring a revolutionary decrease in future car theft.

See also report of JKC/KART conference on page 8 of this newsletter.

(JKC is at [www.jkcenter.co.jp](http://www.jkcenter.co.jp))

## News From The Centres

### Länsförsäkringar – Sweden

Länsförsäkringar is currently undertaking a research project to establish repair technology for aluminium vehicles. The project is focussed on the Amica EKE Diesel, a four-wheeled EU moped Class 1 vehicle built on an aluminium space frame. The need for such research is based on the high unit value of the vehicle together with high cost of repair (even following minor damage). The aim is to establish the technical feasibility and the economic viability of repair options.



**Aluminium Space Frame**

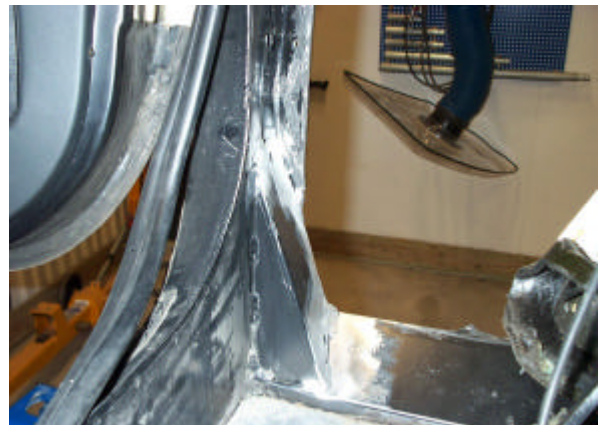


**After Removal Of All Front Parts**

The engine, chassis components, body parts (aluminium sheet metal) and other equipment are assembled to the space frame by riveting and welding. Damage to the body parts can be repaired by straightening the sheet metal or by exchanging the body parts. Due to replacement difficulties it is important to attempt to repair plastic components.



**The Straightening Process**



**Deformed Area of Aluminium Space Frame**

Damage to Amica EKE Diesel, which also includes deformation to the space frame, is an important part of this project. The methods used to solve these problem areas embrace straightening the space frame and replacing separately damaged parts (instead of replacing the whole space frame). The results and experience gained from the aluminium project will be reported on at the RCAR meeting in Australia later this year.

(Länsförsäkringar is at: [www.lansforsakringar.se](http://www.lansforsakringar.se))

## News From The Centres

### IIHS – USA



The Institute's January Status Report leads on success in Washington State in getting drivers to use seat belts. Following a "Click-It or Ticket" campaign, the "Ticket" amounting to a \$86 fine, belt use has risen to 93%. The point is made that in states where there are primary enforcement laws belt use averages 80% compared with 69% in states where officers must stop a motorist for some other violation before issuing a ticket for not buckling up (NHTSA).

Following the theme of buckling up, the Institute reports on their unsuccessful attempt to get the Occupational Safety and Health Administration (OSHA) to rule that all employers use seat belts whilst riding in vehicles on the job. OSHA prefers to achieve greater use by education and not by legislation.

The January issue also includes a warning note on so called Jammers and concludes that these are both dangerous, because they provide a driver with a feeling that he can evade a radar speed check and therefore break the speed limit, and also that these Jammers do not work. "About as good as a block of wood" is an observation by the Institute.

The Report concludes with a short discussion on recent research concerning fatally injured drivers with very high BACS (blood alcohol concentrations) and asks are they likely to be hard-core problem drinkers. See "Drinking Histories of Fatally Injured Drivers" by S P Baker et al, Injury Prevention (September 2002), visit [www.ip.bmjournals.com](http://www.ip.bmjournals.com).

The February edition of IIHS Status Report covers three very live issues. Continuing a theme in the January issue, alcohol impaired driving is discussed and broadened to cover actual accident trends. See details at [www.highwaysafety.org/IIHS](http://www.highwaysafety.org/IIHS) Research by Topic/Fatality Facts. The success of sobriety check points is reported in "Effectiveness of Sobriety Check Points for Reducing Alcohol Involved Crashes" by R W Elder et al in Traffic Injury Prevention 3:266-74.



Elsewhere in the issue Child Booster Seats are spotlighted and the role of NHTSA in developing standards to protect children of all sizes whilst travelling in vehicles is supported. (Readers may also wish to review the results of the State Farm sponsored work with the Philadelphia Children's Hospital and University of Pennsylvania to underline the importance of such an initiative – see "Trends in Booster Seat Use Among Young Children in Crashes" in Paediatrics December 2001 and RCAR Newsletter March 2002 at [www.rcar.org](http://www.rcar.org) and [www.statefarm.com](http://www.statefarm.com).)

The February issue concludes with a thought provoking review of airbag repair and replacement in North America and the need for Standards and legislation to protect the motorist.



The subject of older drivers is addressed in the March issue of Status Report. A new Institute analysis looks at both fatal and non-fatal injury rates. The basic findings are that the oldest drivers are more likely to be involved in crashes, but less likely than teenagers to hurt other people. Drivers younger than 30 are responsible for far more injuries and lives lost than more elderly drivers (see also Status Report September 2001).

Two aspects of airbags are also covered in the issue. First the National Highway Traffic Safety Administration (NHTSA) have relaxed the requirements for the automobile manufacturers in introducing airbags designed to reduce injury risks for out-of-position occupants. Second the Institute added its support to NHSTA in the latter's decision to opt for a 25 mph speed for airbag testing with unbelted dummies rather than 30 mph. The point is made that a 25 mph test speed produces airbags that are just as effective in real world crashes, but pose much less risk of inflation injury to occupants who are out of position (very close to airbags when they first begin inflating).

The Institute concludes on two unrelated issues: it criticises the effects of California's clean air plan, and questions the Federal Highway Administration (FHWA) response to some 3,000 crashes and 400 deaths per year at railroad crossings

IIHS has updated its 28 page .pdf format Complete Guide to the Institute (December 2002) to include the Hyper-G Sled. See the website.

**(IIHS is at [www.highwaysafety.org](http://www.highwaysafety.org))**

## News From The Centres

### MPI—Canada

#### Repairs to Adhesive Bonded Panels

In May 2002 General Motors released a technical bulletin recognising panel bonding as an alternative to mig welding when replacing exterior cosmetic panels. Applications for which GM has approved of the bonding process include outer door panels, tail panels, outer roof panels, and quarter panels.

MPI Research Group has set up further testing to evaluate the reparability of adhesive bonded panels that are subsequently damaged in a collision. The following concerns have surfaced about the reparability of adhesive bonded panels:

- How will they react to the stresses of the repair process?
- Will adhesives affect the reparability of the bonded part?
- Will adhesive bonding complicate the repair process and increase repair costs?

To answer these questions MPI has initiated a research project where they bond the right quarter panels and tail panels on two 1997 Pontiac Sunfires. Each vehicle will be subjected to a full rear impact using a mobile sled. The crash will follow test specifications set out in the Federal Motor Vehicle Safety Standard 301. These tests will be done at low speeds with the objective of causing a minimum 1 inch crush to the rear section.



Post impact inspections will be carried out to evaluate the crash performance of the bond joint. The test vehicles will then have the impact damage repaired. The adhesive mating joints will be closely monitored throughout the repair process. The final evaluation will determine if bonding created additional repair costs.

Currently there are no printed flat rate times for replacing adhesive bonded quarter and tail panels. Research includes a time study to establish possible labour savings that result from the bonding process.

MPI's research group is currently investigating the health risk found in rodent infested vehicles. In Manitoba the frequency of comprehensive claim resulting from rodent infestation has increased substantially over recent years.

Exposure to rodents and what they leave behind can cause a viral disease known as Hantavirus Pulmonary Syndrome, or HPS. This affects the lungs and can be fatal. Hantavirus is carried by several species of rodent common to both Canada and the United States. In Manitoba up to 25% of deer mice are infected with the virus. Research has shown that there have been five deaths in Manitoba attributed to HPS. Our review of the repair industry has also shown that insurance adjusters are, on the whole, unaware that these risks exist, and the ones that do know are unfamiliar with the methods needed to restore a vehicle to a safe condition.

Our research will identify who is at risk of contracting HPS, what precautions should be taken to minimise the risk, and what methods and materials are effective in removing all the health risks.

(MPI is at [www.mpi.mb.ca](http://www.mpi.mb.ca))

## News From The Centres

### Thatcham – UK

Thatcham is working with BMW to train young technicians under BMW's UK Apprentice Programme. Roger Waters, Career Programme Manager at BMW GB Limited comments: "We selected Thatcham to conduct this new programme as we appreciated the depth of expertise available; no other training provider has its own research centre working alongside its technical instructors! Thatcham has worked closely with our own training team to ensure the course content is exactly what our apprentices need to enable them to repair, with confidence, the complex models which BMW currently have in the vehicle parc and which will be introduced over the coming years."

In recent months the following Methods Manuals have been issued by Thatcham: Peugeot 307, Toyota Corolla, Renault Laguna, Vauxhall Corsa 3-Door Hatch, Honda Civic 5-Door Hatch,, Toyota Avensis Verso, Toyota HiLux, Citroën C5. Newsletters have also been issued covering: Toyota Corolla T Sport, Peugeot Paint Codes, Volvo, Toyota Hi-Lux – Time Schedules, together with Thatcham's Repair Time Schedules (TTS generated data).

For Thatcham appointments see RCAR People on Page 2.

(Thatcham is at: [www.thatcham.org](http://www.thatcham.org))

### CESVI Mexico

CESVI Mexico mounted their first ExpoCesvi 2003 on 12 and 13 February 2003. This was set up for automotive repair shops at a national level. Automotive repair tool and equipment manufacturers from Mexico and overseas, who work with the centre, took part.

The opportunity was taken to introduce the valuation system promoted by the Audatex enterprise in Mexico. Audatex is a world-class vehicle damage valuation system for professional use.



The first ExpoCesvi was a complete success and exceeded the expectations of the repair shops, suppliers and the organising committee. A further ExpoCesvi is planned for 2004 with the full support of participants.

A CESVI Mexico magazine is to be introduced in 2003 and this will be distributed to the automotive and insurance sectors in Mexico. Ten descriptive and repair manuals will be published which will cover the most popular national vehicles. It is also planned to publish 28 technical bulletins and, for the second year, The Repair Shops Directory will be produced. This lists and promotes repair shops and repair agencies that are included in the various training programmes. As in previous years a number of insurance adjusters, together with managers and repairers, will be trained with the aim of increasing the quality of service to the insured. A total of 6,300 training delegates are expected for 2003.

There is a full research programme this year covering the following projects: strength of plastic components following repair; repair of aluminium parts; vehicle paint identification; fraud; street security for companies; vehicle classification; design and construction of a pulling bench for motorcycles. The following vehicles will be studied in depth: VW Polo, SEAT Ibiza, Vauxhall Corsa Sedan, Ford Fiesta, Platina and Stratus.

(CESVI Mexico is at [www.cesvimexico.com.mx](http://www.cesvimexico.com.mx))

## News From The Centres

### CESVIMAP – Spain

To gain access to the world of work without working for a university degree, Spain also has the option of what is called “Professional Training”. These study courses, available for those over the age of sixteen, prepare students for work within a specific sector.



CESVIMAP’s new educational publications are aimed at students who wish to work in the automobile sector, the object being to teach repair methods and workshop management. We have brought out three titles so far: “*Metallic and Synthetic Elements*”, “*Repair of Fixed Elements*”, “*Repair and Unmovable Elements Repair*”. Soon to be on the market is: “*Management and Logistics of Maintenance in Automation*”. All these titles are in line with the official programme of study established by the national teaching authorities.

This initiative is in response to the need to provide the contents of these training course with a didactic concept, with numerous practical examples taken from repairs carried out in CESVIMAP workshops, and with photographs and diagram which aid comprehension. There is also a teacher’s guide.

CESVIMAP has been awarded ISO 14001 certification, which recognises that CESVIMAP has introduced an efficient environmental management system. This certification means that CESVIMAP’s commitment to preserving the environment has external recognition too. Improved environmental management, improved internal organisation processes, increased awareness of this area among staff, and appropriate waste management in productive processes are some of the objectives which have been met and which are certified by the ISO 14001.



This concern for the environment goes hand in hand with two other of our fundamental concerns: the quality of our products and the quality of the services that we at CESVIMAP offer, and the setting up of working procedures which ensure the prevention of accidents and risk in the workplace. Accordingly, CESVIMAP has already also been awarded ISO 9001 certification. The scope of this certification covers both the design of training programmes and the teaching



The Spiga® computer management programme was created by CESVIMAP to manage automobile repair shops, improving their efficiency and cost effectiveness. Now the second generation has arrived. Under the name of Spiga® 2.3 this completely updated software, compatible with Windows, manages all the data related to the vehicle to be repaired. The reception of the car in the workshop, billing, preparing repair estimates, spare part management, repair time control and securing statistics are the phases which make up this programme. The objectives of Spiga® 2.3 are the improvement and cost effectiveness of repair services.

(CESVIMAP is at [www.cesvimap.com](http://www.cesvimap.com))

## News From The Centres

### KART and JKC Regional Technical Conference

KART and JKC held their 4<sup>th</sup> Annual Technical Conference from 6-8 November 2002. The aims of the conference are the exchange of technical information, to provide the opportunity to make new contacts and to renew old friendships. It is held in Korea and Japan in alternate years, the 2002 meeting being held at JKC in Tokyo.

Six members of KART joined JKC engineers and the programme covered technical presentations, technical site tour and social aspects.

KART presented on:

- Activities for practical use of KART Repair Time Schedules.
- ARECCOM On-Line System.
- Vehicle Grouping System.
- Properties of Mid-Coat in Refinishing of Car Body.
- Training Programmes for Adjusters.

JKC presented on:

- Unique Features of VW New Beetle's Body Construction.
- Front Suspension Damage Inspection Manual and Compilation of Damage Examples.
- Research on Crash Characteristics of Front Side Members Repaired by Different Methods.
- Development of Repair Information by E-Mail.



The technical site tour was to Toyota Techno Craft, which is Toyota's largest service station in Tokyo. Delegates also enjoyed the social events, eg dinner during a boat trip in Tokyo Bay and a Karaoke party. The accompanying photographs provide a flavour of the event.



The conference was a great success and JKC members were most impressed by the attitude of KART's engineers towards their research. Friendships were cemented between the engineers of the two centres.

(I am most grateful for this short report from Shigeyuki Yamaoka of JKC—SecGen)



## Global Priorities For Vehicle Safety



**Murray Mackay**  
Accident Research Centre  
University of Birmingham, UK



**Elaine Wodzin**  
International Injury Scaling Committee  
AAAM

*(For Biographies see end of article)*

### Abstract

Currently just over one million people die in road crashes each year. That number will rise to 2 million by 2020. 85% of these crashes occur in developing countries and of those about 75% are pedestrians, cyclists and motorcyclists. This paper will outline the scale and trends in road traffic mortality and morbidity, and draw contrasts between the industrialized countries and those which are currently going through a period of rapid growth in vehicle ownership. With these data as background, some sample studies are summarized to illustrate the importance of vehicle exterior design in relation to the vulnerable road users, compatibility between trucks and other road users, and the advantages of special urban vehicles in the evolving megacities of low income countries. Contrasts are drawn between the current priorities in North America and Europe on the one hand, and the developing world on the other in terms of vehicle safety design. Suggestions are put forward as to how the growing problems of traffic injury in the developing world might be addressed.

### Introduction

Data on traffic crashes and the consequent injuries on a global scale are fragmentary, but over the last ten years several organizations have attempted to outline the nature and severity of traffic injuries and predict trends for the next decade. Such efforts have been part of a wider effort to quantify the health of the world's population. Harvard University's report on the Global Burden of Disease (Murray and Lopez 1996) provided a major synthesis of the numerical aspects of disease, defined to include injury, using Disability Adjusted Life Years (DALYs) as the preferred parameter for assessing the impact of diseases and injuries across the world. This parameter is a combination of two factors. The first is life years lost by premature death in comparison to the standardized lifespan of men and women in the world's longest surviving population, Japan. The second is for the survivors who are disabled. A seven point scale was used to weight the severity of all disabilities in terms of their claim on health care resources in comparison to a healthy population. DALYs therefore do not assess the total societal impact of disease and injury, but this methodology does allow a numerical picture of the health of the world's population and in particular what trends are occurring. Updates using this method have been conducted (Krug 1999) and also specific studies of traffic fatalities (Jacobs et al 2000), and these sources allow the current situation to be described and some trends predicted.

Under-reporting is a major factor. Even in highly motorized countries with relatively complex data collection procedures, certain classes of traffic casualty are significantly under-reported. In the EU for example cyclist, pedestrian and motorcyclist casualties treated in hospital are not recorded in police data bases by amounts which vary from 10% to 60% depending on injury severity and class of road user. In many low income countries without adequate recording procedures, the majority of traffic casualties go unrecorded. Hence, projections from sample studies are necessary to attempt quantitative assessments, with all the associated uncertainties. Even for fatalities under-reporting in many countries is significant. With these, caveats, however the relative importance of traffic crashes today and over the next ten years can be described.

In 1998 the World Health Organisation estimated 1,170,694 road traffic deaths worldwide. Such deaths were the tenth leading cause of death for all ages, accounting for 2.2% of global mortality. Road traffic deaths were the second leading cause of death for those aged 15-44 years (22 deaths per 100,000) and the third leading cause of death for the 5-14 year age group (14 deaths per 100,000) (Krug 1999).

## Global Priorities For Vehicle Safety (continued)

Traffic crashes accounted for 1,029,037 deaths in low- and middle-income countries (88% of global mortality from crashes) and 141,656 deaths in high-income countries (OECD grouping), or 12%. India with 216,859 deaths and China with 178,894 deaths contributed significantly (Norton et al. 2001). Using DALYs to assess the burden of the 10 leading causes globally, the following projection has been made by the WHO.

1998	2020
<b>Disease or Injury</b>	<b>Disease or Injury</b>
1. Respiratory Infections	1. Ischaemic Heart Disease
2. HIV/AIDS	2. Unipolar Major Depression
3. Perinatal Conditions	3. <b>Road Traffic Accidents</b>
4. Diarrhoeal Diseases	4. Cerebrovascular Disease
5. Unipolar Major Depression	5. Obstructive Pulmonary Disease
6. Ischaemic Heart Disease	6. Respiratory Infections
7. Cerebrovascular Disease	7. Tuberculosis
8. Malaria	8. War
9. <b>Road Traffic Accidents</b>	9. Diarrhoeal Diseases
10. Obstructive Pulmonary Disease	10. HIV/AIDS

Thus, this and other analyses suggest that road traffic injury will emerge as a major health concern around the world. Krug (1999) has indicated that there will likely be 2.3 million road traffic deaths annually by the year 2020. In economic terms, Jacobs et al. (2000) has shown that traffic accidents absorb about 1% of GNP in developing countries, 1.5% in transitional countries and 2% in highly motorized countries, although within each group there are significant variations from 0.3% in Vietnam to almost 5% in the USA, and Kwa Zulu, Natal. For the United Kingdom the annual cost approaches 2% of GNP as it does for the EU as a whole.

### The Casualty Mix

The diverse nature of traffic crashes is shown in the follow distributions between the major classes of traffic death in a selection of countries:

Country	Pedestrian	Bicyclist	MTWV	Cars/LTVs.	Buses etc.
Thailand	47%	6%	36%	12%	-
Malaysia	15%	6%	57%	19%	3%
(Delhi)	42%	14%	27%	12%	5%
Japan	27%	10%	20%	42%	1%
Netherlands	10%	22%	12%	55%	-
Australia	18%	4%	11%	65%	2%
EU	16%	5%	16%	57%	6%
USA	13%	2%	5%	79%	1%

Even from this small selection of countries, it is clear that in the developing world the very predominant classes of casualties are the vulnerable road users - pedestrians, cyclists and motorcyclists. Vehicle occupants are a minority of the fatalities (and casualties) in those countries. What also appears, however, is that even in highly motorized countries such as Japan and the EU, the vulnerable road users are important. In Japan they are the majority of fatalities, and in the EU they represent about a quarter. Indeed the United States is the unusual motorized country in having a large majority of its fatalities as vehicle occupants.

From this short survey, it is clear that over the next two decades road casualties are likely to double. At present over 80% of casualties occur in low and middle income countries, and that proportion will increase to well over 90% by 2020. In highly motorized countries, the number of deaths and serious casualties will be stable or will decline somewhat whereas in the developing world the growth in deaths and injuries will be over 4% per year, leading to a doubling of the numbers over two decades.

Given the historical observation that car ownership does not start to rise quickly until income per head reaches a value of around US\$2,000, and given that the per capita income in most developing countries is well below that figure, then a large shift to car ownership is not going to occur in those countries. The predominant categories of road casualties will therefore continue to be the vulnerable road users through the year 2020 (Mackay 2000).

## Global Priorities For Vehicle Safety (continued)

On the other hand, although small in absolute numbers, based on various national reports growth rate in car ownership is likely to be very rapid. The following table shows forecasts of car populations in selected countries, based on AAMA data:

**Forecasts of Car Populations 1995 – 2005**  
(in thousands)

Country	1995	2005	Percentage Change
Canada	13,800	15,000	8.3
USA	148,200	156,000	5.4
Germany	40,500	44,000	9.8
UK	24,960	27,500	10.2
Japan	44,680	55,800	25.0
Mexico	8,060	10,900	35.2
Brazil	12,500	15,800	26.4
Poland	7,340	11,160	52.0
Malaysia	2,500	4,930	97.2
China	2,700	7,850	190.7
India	3,650	8,120	124.0

These data suggest that taken together the market for cars in middle and low income countries is a significant part of the world market today and by 2020 will likely be the major areas of the world where new vehicles will be sold.

Estimating the number of vehicles in the world today involves a number of heroic assumptions. There are various data bases all of which ultimately draw on national vehicle registration sources or vehicle annual production data. In many low income countries such registries are incomplete. There are different definitions of motor vehicles, cars, trucks, buses, vans, motorcycles, scooters, powered road vehicles, etc. A estimate made in 2000 suggested that there may be about 700 million cars, trucks, buses and vans, and perhaps 300 million two-wheeled motor vehicles (Mackay 2000). Estimating long term saturation levels is even more uncertain. In North America the car fleet is approximately stable with around 750 powered vehicles per 1000 population. In Europe the saturation level appears to be occurring at a somewhat lower figure of around 600 vehicles per 1000 population. Clearly such levels of vehicle ownership will take decades to occur, if ever, but the need to have personal motorized transport appears to be almost as fundamental as food, health and safety.

### Policy Consequences

Given this superficial review, what are the implications for traffic and vehicle safety policies? A framework for a rational strategy at national level is in place in most highly motorized countries and in some middle and low income countries. Such a strategy involves recognizing the importance of science-based countermeasures with a framework of five areas:

<b>Exposure Control:</b>	reducing high risk exposures,
<b>Crash Prevention:</b>	the design and operation of the road network, and primary safety in vehicle design,
<b>Behavioral Change:</b>	improving road user behaviour whilst recognizing the limitations of human performance and fallibility.
<b>Injury Control:</b>	improving the crash performance of vehicles and the roadside.
<b>Post-Crash Injury Management:</b>	enhancing pre-hospital care and improving quality of trauma management.

These five strategies all contribute to a rational framework for diminishing traffic deaths and injuries, but their relative contributions vary according to the level of motorization and development generally of a particular country (Trinca et al 1988). Broadly speaking, infrastructure improvements are intrinsically expensive and long term, although targeted traffic management and blackspot elimination schemes can be extremely effective. Behavioural modification generally is a long term strategy, involving changing attitudes of all road users. Post-crash injury countermeasures, although important, intrinsically cannot deliver large returns for deaths and serious injuries. This is because, for example, about 85% of traffic deaths result from totally untreatable injuries.

Therefore, vehicle design policies are particularly important for the developing countries of the world, both in terms of primary and secondary safety. However, the current priorities in these areas seem to be driven totally by the priorities of the United States and Europe. It is therefore worth examining where the priorities of the highly motorized countries are coincident with those of low and middle income countries and where they differ.

## Global Priorities For Vehicle Safety (continued)

### Vehicle Safety Priorities

Clearly the vulnerable road users - pedestrians, cyclists and motorcyclists - are the top priority in developing countries. Given the reductions in deaths and injuries predicted if the proposed EU directive on safer car fronts were implemented, some 20% reduction in pedestrian and cyclist deaths under EU road conditions, then the worldwide adoption of such a requirement would be a major benefit. Furthermore, extending the friendly vehicle exterior concept to other vehicles, especially vans, pick-ups, trucks and buses would be enormously beneficial for the vulnerable road users in the cities of developing countries.

Given the growth of megacities such as Shanghai, Beijing, Bangkok, San Paulo, Mexico City and others where enormous numbers of people live in totally urban environments, the provision of protection of the vulnerable road users becomes very important. Many such cities have unique vehicles such as the tuk-tuks of Bangkok and Jakarta, and the three-wheeled taxis of India. Such vehicles incorporate almost no concepts of either pedestrian or occupant crash protection. They therefore represent a great opportunity for the transfer of technical knowledge from western automobile designers to improve the safety of those vehicles (Mohan and Tiwari 1998).

Urban buses all over the world operate in a road environment full of vulnerable road users, and such buses have a working life two to three times that of cars. Thus over the design life of such vehicles, they are about 20 times more likely to kill or injure a pedestrian than will a car. Hence, such buses should have a high priority for friendly exterior design. Such arguments apply to a somewhat lesser degree to trucks, but again in the very large cities of Asia, trucks are a major part of the traffic stream and spend much of their working lives in an urban environment. Hence, a specific design for an urban truck is needed (Mackay and Tiwari 2001).

Compatibility is perceived as a high priority in the US and the EU at present, although within the framework of compatibility, the US has a greater need to reconcile SUVs with cars, whereas in Europe there is perhaps greater interest in car to car compatibility for both front to front, and front to side crash conditions. In low and middle income countries, compatibility issues are related more to truck to car collisions, both front to front, and front to rear (of the truck) impacts. The greatest priority for such countries must be to improve the geometry and structures of trucks to better accommodate impacts from smaller vehicles, not just cars but motorcycles and bicycles as well.

The fitting and use of seat belts, both front and rear in cars, and in coaches and trucks is an important priority in low and middle income countries, given much higher occupancy rates, especially for rear seats of cars. High usage rates are not just a matter of national enforcement policies but can clearly be greatly encouraged by technologies now being introduced in Europe with warning sounds and lights of increasing intensity over relatively long durations. The draft EU directive on such devices needs to be adapted to rear seats as well and promoted widely.

In the primary safety arena, visibility is perhaps of greater importance in low and middle-income countries than here because of the absence of adequate street lighting in urban areas of most of the developing world. Daylight running lights have been shown to be highly effective in some Asian countries (Radin Umar et al 1996), especially for motorcyclists, and the technology to require lights to be on when vehicles are moving is simple.

Evidence from a number of developing countries shows that poor maintenance is a significant contributor to crash causation. Whilst the operator has obvious obligations, the design of robust, simple components and systems with long life, low maintenance characteristics can make a major contribution. At present in the west there is a tendency towards greater and greater sophistication and higher performance, with the underlying requirement for adequate maintenance and regular replacement. The reverse is a better policy for developing countries.

### Conclusions

This short review touches selectively on only a few issues in vehicle safety in the context of the next twenty years. Overall the importance of low and middle income countries will increase greatly both in terms of their already great contribution to the casualty scene on a global scale, but also in terms of their specific requirements and priorities for vehicle safety countermeasures. Many developments in vehicle safety will benefit everyone, but European and North American designers, manufacturers and regulators must pay greater attention to the needs of developing countries if they wish for globalisation to be beneficial, and for the world car to live up to its name.

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### Murray Mackay

Murray established and ran the Accident Research Centre at the University of Birmingham from 1964 to 1996 and is now Professor Emeritus of Transport Safety. He has specialised in the crashworthiness of vehicles and the scientific investigation of accidents, and also in the development of rational traffic safety policies in developing countries. He is a consultant to the World Health Organisation and is president of the International Research Council on the Biomechanics of Impacts.

### Elaine Wodzin

Elaine Wodzin was Executive Director of the Association of the Advancement of Automotive Medicine, 1981-2000. Also in 1981 she founded the New York Coalition for Safety Belt Use which resulted in passage of the first mandatory seat belt usage law in the USA in 1984. She currently co-chairs the International Injury Scaling Committee which oversees the Abbreviated Injury Scale, and has a long-standing interest in developing effective national and international policies on traffic injury control and the institutional arrangements for implementing such policies.

## Euro NCAP Results

### Test Results from Euro NCAP Released 28 January 2003

Family Car	Occupant Protection	Pedestrian Protection
Skoda Superb	4 Stars	No Stars
<b>Mini-MPV</b>		
Opel/Vauxhall Meriva	4 Stars	1 Star
<b>Large Off-Roader</b>		
BMS X-5	4 Stars	1 Star
<b>Small Off-Roader</b>		
Mitsubishi Pajero Pinin	3 Stars	1 Star
<b>Two Seater Roadsters</b>		
Audi TT	4 Stars	No Stars
MGTF	4 Stars	3 Stars

Related sites: Australia: [www.nrma.com.au](http://www.nrma.com.au)  
 Japan: [www.osa.go.jp](http://www.osa.go.jp)  
 USA: [www.nhtsa.gov/cars/testing/ncap](http://www.nhtsa.gov/cars/testing/ncap)  
[www.highwaysafety.org](http://www.highwaysafety.org)



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## The RCAR Network

Of the 24 RCAR Centres in 17 countries, 21 have web sites. Addresses are to be found on [www.rcar.org](http://www.rcar.org). However, for convenience, web sites are also listed below.

AZT	<a href="http://www.allianz-azt.de">www.allianz-azt.de</a>
Centro Zaragoza	<a href="http://www.centro-zaragoza.com">www.centro-zaragoza.com</a>
Cesvimap	<a href="http://www.cesvimap.com">www.cesvimap.com</a>
Cesvi Argentina	<a href="http://www.cesvi.com.ar">www.cesvi.com.ar</a>
Cesvi Brasil	<a href="http://www.cesvibrasil.br">www.cesvibrasil.br</a>
Cesvi Colombia	<a href="http://www.cesvicolombia.com">www.cesvicolombia.com</a>
Cesvi Mexico	<a href="http://www.cesvimexico.com.mx">www.cesvimexico.com.mx</a>
CESTAR Italy	<a href="http://www.cestar.it">www.cestar.it</a>
Folksam Auto	<a href="http://www.folksamauto.com">www.folksamauto.com</a>
ICBC	<a href="http://www.icbc.com">www.icbc.com</a>
IIHS	<a href="http://www.highwaysafety.org">www.highwaysafety.org</a>
JKC	<a href="http://www.jikencenter.co.jp">www.jikencenter.co.jp</a>
KART	<a href="http://www.kidi.co.kr">www.kidi.co.kr</a>
KTI	<a href="http://www.k-t-i.de">www.k-t-i.de</a>
Lansforsakringar	<a href="http://www.lansforsakringar.se">www.lansforsakringar.se</a>
MPI	<a href="http://www.mpi.mb.ca">www.mpi.mb.ca</a>
NRMA/IAG	<a href="http://www.nrma.com.au">www.nrma.com.au</a>
State Farm	<a href="http://www.statefarm.com">www.statefarm.com</a>
Tech-Cor	<a href="http://www.tech-cor.com">www.tech-cor.com</a>
Thatcham	<a href="http://www.thatcham.org">www.thatcham.org</a>
VIC/IBC	<a href="http://www.vicc.com">www.vicc.com</a>

## Dates For Your Diary

**18th International Technical Conference on the Enhanced Safety of Vehicles (ESV)** is to be held in Nagoya, Japan, 19-22 May 2003.  
Details: [www.esv2003.com](http://www.esv2003.com)

**International Bodyshop Industry Symposium (IBIS)** is to be held in Montreux, Switzerland, 4-6 June 2003.  
Details: [www.bodyshopmag.com](http://www.bodyshopmag.com)

**47th Annual Conference of the Association for the Advancement of Automotive Medicine (AAAM)** is to be held in Lisbon, Portugal, 22-24 September 2003.  
Details: [www.carcrash.org](http://www.carcrash.org)

**Annual RCAR Conference 2003** is to be held in Sydney, Australia, 21-26 September 2003 and will be hosted by Insurance Australia Group (IAG).

**47th STAPP Car Crash Conference** is to be held in San Diego, California, 27-29 October 2003.  
Details: [www.stapp.org](http://www.stapp.org)

**NACE 2003** is to be held in Orlando, Florida, 4-7 December 2003.  
Details: [www.naceexpo.com](http://www.naceexpo.com)

## From The Secretary General

Welcome to the March 2003 Newsletter. The contents are varied and I very much hope that you find something relevant and of interest. News from 9 of our 24 Centres covers management changes, research projects, new product launches and a report on the regional conference of JKC and KART held in Tokyo. It seems quite a long time since the meeting in Stockholm and I hope this issue keeps you in touch and reduces the withdrawal symptoms!

As you know, the Newsletter is put onto the web at [www.rcar.org/What's New](http://www.rcar.org/What's%20New). Just recently I have been getting more detailed web stats from our ISP. It is particularly interesting to note that the Newsletters are a popular feature of the web site and seem to be downloaded regularly by visitors. The popularity of the web site itself is also growing and for the last three months, namely December 2002 to February 2003, hits registered in excess of 30,000 per month—about double the rate just 18 months ago.

Our Newsletters include a longer technical article as well as news on people and progress in the Centres. I am delighted that we are able to include in this issue "Global Priorities for Vehicle Safety". This is a joint paper on an important subject for us by two influential figures in the Automobile Safety Research Community, Murray Mackay of the Accident Research Centre at the University of Birmingham, and Elaine Wodzin, recently Executive Director of the Association for the Advancement of Automotive Medicine. I am grateful to both of them; their paper is printed in full.

I will be putting together the Project Catalogue for publication in April/May 2003. At that time I will send out our Annual Report and Financial Statements.

With very best wishes from a cold but very sunny UK in March.

Michael Smith

## News, News...

It is not the intention to provide the latest automotive or insurance industry news in this Newsletter. However there are some excellent sources available on the Web and members may find the following sites useful.

Automotive Online.	<a href="http://www.automotive-online.com">http://www.automotive-online.com</a>
Automotive.com	<a href="http://www.automotive.com">http://www.automotive.com</a>
AM-online	<a href="http://www.am-online.com">http://www.am-online.com</a>
Associated Press.	<a href="http://www.ap.org">http://www.ap.org</a>
AutomotiveNewsWire.	<a href="http://www.brgtownsend.com">http://www.brgtownsend.com</a>
Bloomberg.	<a href="http://www.bloomberg.com">http://www.bloomberg.com</a>
CeBIT	<a href="http://www.cebit.de">http://www.cebit.de</a>
Cisco Systems	<a href="http://www.cisco.com">http://www.cisco.com</a>
CMGI	<a href="http://www.cmgi.com">http://www.cmgi.com</a>
CNN.	<a href="http://cnn.com">http://cnn.com</a>
Far East Newsletter.	<a href="http://www.feer.com">http://www.feer.com</a>
Fleet NewsNet.	<a href="http://www.automotive.co.uk">http://www.automotive.co.uk</a>
JUST-AUTO	<a href="http://just-auto.com">http://just-auto.com</a>
MSN.	<a href="http://www.msn.com">http://www.msn.com</a>
New York Times.	<a href="http://www.nytimes.com">http://www.nytimes.com</a>
Newspage.	<a href="http://www.newspage.com">http://www.newspage.com</a>
ODETTE	<a href="http://www.odette.org">http://www.odette.org</a>
PRNewswire	<a href="http://www.prnewswire.com">http://www.prnewswire.com</a>
REUTERS.	<a href="http://www.reuters.com">http://www.reuters.com</a>
Roadtransport.	<a href="http://www.roadtransport.net">http://www.roadtransport.net</a>
Silicon.	<a href="http://www.silicon.com">http://www.silicon.com</a>
Slate.	<a href="http://www.slate.com">http://www.slate.com</a>
Wired.	<a href="http://www.wired.com">http://www.wired.com</a>
Wall Street Journal.	<a href="http://www.interactive.wsj.com">http://www.interactive.wsj.com</a>
Yahoo!	<a href="http://uk.yahoo.com">http://uk.yahoo.com</a>
ZD.	<a href="http://cgi.zdnet.com">http://cgi.zdnet.com</a>