SAE AUSTRALASIA

AUTOENGINEER

THE JOURNAL OF THE SOCIETY OF AUTOMOTIVE ENGINEERS – AUSTRALASIA

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- FAPM Automotive component missions
- Are EVs too quiet?

ISSUE 40 DECEMBER 2010

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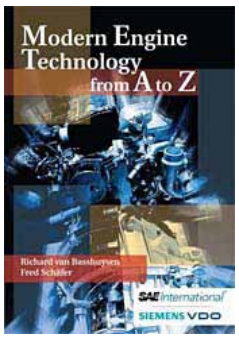

Modern Engine Technology from A to Z

By Richard Van Basshuysen and Fred Schaefer

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A best seller, this part dictionary, part encyclopedia, Modern Engine Technology from A to Z, will serve as your comprehensive reference guide for many years to come. Keywords throughout the text are in alphabetical order and highlighted in blue to make them easier to find, followed, where relevant, by subentries extending to as many as four sublevels.

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AUTOENGINEER

Australasia Issue 40
December 2010

Society of Automotive
Engineers – Australasia
Suite B, Level 2
70 Dorcas Street,
South Bank 3006

ABN 95 004 248 604
ISSN 00360651

Autoengineer Australasia is published quarterly as a service to SAE-A, FAPM and AutoCRC members.

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Printing
Brougham Press

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Contents



On the cover: For the second year in a row, a "Winged Warrior" from Monash University won the Formula SAE-Australasia engineering education competition. *See article page 12.*
Formula SAE-A photos courtesy of JJ's Photography.

2011 Events Calendar

This events calendar, which is correct at the time of publishing, is provided as a service to help you plan your diary, and includes:

- SAE-A events for members and non-members. For information T: 03 9696 5190 or visit www.sae-a.com.au
- FAPM events for members. For information T: 03 9863 2401 or visit www.fapm.com.au
- AutoCRC events. For information T: 03 9948 0458 or visit www.autocrc.com.au
- ITS Australia events. For information see below or visit www.its-australia.com.au

February		
15	FAPM	Central Region Meeting
16	FAPM	Southern Region Meeting
17	SAE-A	Light Weight Modular Vehicle Platform, Geelong
21 – 25	SAE-A	Technical Accident Investigation and Reconstruction Course, Melbourne
23	FAPM	Executive Council Meeting
March		
3	FAPM	Northern Region Meeting
11	SAE-A & AutoCRC	Electric Vehicles, Queensland
17	SAE-A	Truck Conference, Melbourne
25	SAE-A & AutoCRC	Electric Vehicles, Sydney
April		
12	SAE-A & AutoCRC	Electric Vehicles – Canberra
19	SAE-A & AutoCRC	Ergonomics Workshop, Adelaide
20	FAPM	Southern Region Meeting
May		
10	FAPM	Central Region Meeting
12-14	AAAA	Australian Auto Aftermarket Expo
18	FAPM	Northern Region Meeting
19	SAE-A & AutoCRC	Manufacturing Technologies, Adelaide
24	SAE-A	Annual General Meeting and Networking Dinner, Melbourne
25	FAPM	Executive Council Meeting
June		
8-10	ITS Australia	11th ITS Asia Pacific Forum, Taiwan T: 03 9646 6466
TBA	SAE-A & AutoCRC	Lifecycle Analysis & End of Life Vehicles
22	FAPM	Southern Region Meeting
July		
5	SAE-A	Change By Design Conference & Automotive Engineering Excellence Awards
7	SAE-A & AutoCRC	AutoCRC AAW event
8	FAPM	FAPM Conference
15-17	SAE-A	Road Transport Engine Emissions
August		
16	FAPM	Central Region Annual General Meeting
23	FAPM	Northern Region Annual General Meeting
24	FAPM	Southern Region Meeting
September		
20-22	ITS Australia	National ITS Summit, Gold Coast T: 07 3255 1002 www.itssummit.com
21	FAPM	Executive Council Meeting
October		
16	ITS Australia	18th ITS World Congress, Orlando, USA T: 03 9646 6466
November		
4	FAPM	Southern Region Annual Dinner
15	FAPM	Central Region Meeting (Christmas Drinks)
16	FAPM	Northern Region Meeting
30	FAPM	Executive Council Meeting Annual General Meeting
30	FAPM	Southern Region End of Year Dinner
December		
8-11	SAE-A	Formula SAE-A

First look at new look Territory

Ford Australia has revealed the first image of the new Territory SUV to be released next year as part of an aggressive new-model year in 2011 in which about 85% of the Ford Australia catalogue will either be replaced or updated.

"The Ford Territory set a new benchmark when it was first released and it is set to achieve this again – and more," said Bob Graziano, President and CEO of Ford Australia. "This is an exceptional SUV. It wears an exciting new look and will boast an extensive list of technical highlights. The Ford Australia team is taking the Territory to an all-new level of performance, refinement and quality, and customers will definitely experience these advancements when they drive it."

The multi-award-winning SUV will wear a stylish suit based on Ford's kinetic design language, making it instantly recognisable as a member of the Ford vehicle family. It also provides a glimpse into the future of Ford's global SUV styling.

The global Ford family "kinetic" design theme sets the style for the 2011 Territory SUV.

New Territory's design overhaul is significant both inside and out. Its fresh new look will include a major interior update and boast a number of technology highlights, including the introduction of turbo-diesel power. Production begins early in the New Year.

The next 18 months will be Ford Australia's busiest period in its 85-year history. The Blue Oval bolstered its line-up this month with the new WT Fiesta hatch and sedan ranges and the arrival of the updated MC Mondeo range. Next year will bring the new Territory SUV and new Focus, which made its world premiere earlier this year. The Falcon will be enhanced with a stylish new look and new power train options, including the introduction of Ford's global EcoBoost engine and ultra-efficient LPI (Liquid Phase Injection) technology. In addition, the Australian-designed-and-developed Ranger truck will be become available and will be sold in more than 180 markets around the world.

Waste-to-ethanol plant announced

A pioneering plant capable of turning household rubbish into ethanol has been announced with the formation of Flex Ethanol Australia.

Holden Chairman and Managing Director Mike Devereux.

Holden Chairman and Managing Director Mike Devereux said the new company would take the project to the next stage of commercialisation with a Victorian based plant capable of turning up to a million tonnes of household rubbish and building waste into more than 200 million litres of ethanol a year.

The ethanol produced by the plant would be used in a range of ethanol-blend fuels, including the alternative fuel known commonly as E85, which contains a mixture of up to 85% ethanol and 15% regular petrol. The fuel is sold at Caltex service stations as Bio E-Flex and can be used to power flex-fuel vehicles in Holden's VE Series II Commodore range.

Mike Devereux said the launch of these cars capable of running on high-blend ethanol fuel and Holden's involvement in the second-generation ethanol plant demonstrated the company's commitment to sustainable motoring through the development of renewable fuels that reduce greenhouse gas emissions and improve energy security.

Holden and Caltex were committed to giving drivers the choice to use a fuel that is up to 85% renewable, with the potential to reduce their vehicles' 'well to wheel' CO2 emissions by up to 40%. "Our vision is that this technology, and the shift towards ethanol-based fuel, in time, could cut Australia's dependence on petrol by up to 30% and make a major contribution to sustainable motoring and greenhouse gas reduction," he said.

One of the first projects undertaken by Flex Ethanol Australia would be a comprehensive trial at Coskata's facility in the US, to test the suitability of Australian-specific household waste for ethanol.

Vehicle sales outperform other economic indicators

Official VFACTS data released by the Federal Chamber of Automotive Industries (FCAI) showed that 87,342 passenger cars, SUVs and commercial vehicles were sold in November, up 1.8% (or 1,509 vehicles) on the same month in 2009.

"These figures show new car sales continue to outperform other economic indicators, including retail spending and business investment," FCAI Chief Executive Andrew McKellar said. "Much of the strength of the market can be attributed to the affordability of new vehicles, evidenced by the healthy sales to private buyers, which was up 9.6% in November," Andrew McKellar said.

Year-to-date, 948,987 vehicles have been sold, an increase of 11.8% compared to the same period in 2009.

"It is now clear that total sales for 2010 will safely exceed one million units – only the third time this will have been achieved," he said. The SUV segment was again the strongest performer during November, recording an increase of 13.3%, followed by passenger cars (up 5%) and heavy commercials (up 6.2%). The light commercial segment decreased by 18.9%.

Toyota was the top selling marque in November with 19,911 sales, followed by Holden with 11,354 then, Ford with 7,844 units.

New VACC President

The VACC has elected Tony La Rosa as the 53rd President in the Chamber's 92 year history.

Tony La Rosa said it was an honour and privilege to be elected VACC President. "I look forward to the next two years as President, to doing what I can to assist members and to working closely with the Executive Board to ensure VACC meets the inevitable challenges and remains an effective and efficient association," he said.

Tony La Rosa owns Sunset Auto Sales in Watsonia and is a member of VACC's Executive Board, Board of Management and the Executive Committee of the Used Car Traders' Division. He first entered the automotive industry as an apprentice panel beater and became a VACC member in 1987 through the Service Station and Convenience Stores Division. He was also one of the first people to introduce self-serve car washes to Australia.

VACC President Tony La Rosa.

Australian to style Lincoln

Australian designer Max Wolff has been hired by Ford Motor Company to shape Lincoln's future and compete with bigger luxury rivals. The 38-year-old Monash University graduate will be Lincoln's design director.

Max Wolff has been exterior design director for Cadillac since 2007 and has held various positions in design with GM, including a period at GM Daewoo in South Korea where he helped design the Chevrolet Cruze compact. He started his career at GM Holden in 1998.

Max Wolff

Space Forum explores PNT

Delegates from 30 countries and seven international organisations met recently in Melbourne at the 17th Asia-Pacific Regional Space Agency Forum to explore how space technology and industry can help solve climate change and foster socio-economic development.

The Forum addressed the space sector's potential to deliver technologies that directly impact our day-to-day lives, such as better tele-education, tele-medicine and disaster management in the region.

Of special relevance to the mobility industry is the development of the region's satellite positioning, navigation and timing (PNT) applications to open new opportunities for socio-economic development. The Allen Consulting Group estimates improvement in the precision and standardisation of PNT technologies could increase Australia's GDP by between $6 billion and $12 billion by 2030.

2010 – a year of consolidation

By Max Chanter, SAE-A Executive Director

The 2010 working year has drawn to a close and it's time for us to reflect on what has been achieved and to look ahead to what 2011 will bring.

This year has brought us mixed results. The first six months were very good for SAE-A with respect to financial performance and event attendance. Our activities were well attended, interesting and successful in meeting budget expectations.

Unfortunately, the last six months were the opposite, with a number of events rescheduled due to poor bookings, speaker non-availability for Perth and Adelaide activities, and other factors beyond our control, which ultimately affected the bottom line. Nevertheless, it was still a busy year with over 20 events organised on some very interesting subjects.

Most importantly, our membership has remained stable, which is encouraging given the rough couple of years the industry has endured. We thank our members for their ongoing support.

An initiative designed to recognise members for their distinguished achievements in Australian automotive engineering is the 1927 Founders Award, which will be presented each year. The Founders Award is a suitably mounted Commemorative Australian florin minted in 1927, the year the Society was formed. Further details are on Page 9.

Industry networking

An important focus for SAE-A during 2010 was establishing dialogue with other specialist automotive industry organisations. We have held meetings with a range of associations with a view to collaborating on future activities to the benefit of members of both organisations.

Among the tangible outcomes in this endeavour is the addition of AutoCRC as a new contributor to Autoengineer journal. We welcome them and look forward to reading about the great work they do in industry led research. They join the Federation of Automotive Products Manufacturers, which has been a contributor for many years. An important benefit of this collaboration in Autoengineer is the journal achieves wider distribution among key industry stakeholders.

As ever, the automotive industry continues to change in structure as well as product offering. This constant change demands an open minded approach to ensure that SAE-A remains a relevant contributor to the industry. Expanding the network of organisations that we work with enables us to offer our own members opportunities that would not be available or affordable if we acted alone.

The 2011 calendar

2011 will be another busy year for National Office. In planning our 2011 calendar, we hope to provide an interesting and topical range of subjects for events to suit members' requests and to improve our divisions' opportunities to attract members.

Among our new initiative in the first half of the year will be our collaboration with the Australian Automotive Aftermarket Association in Automotive Aftermarket Expo and Collision Repair Expo to be held at the Melbourne Exhibition Centre on 12 to 14 May 2011. SAE-A will have a presence at the Expos and we are also planning to hold a special event at the Expo on 12 May.

The Victorian Automotive Week in 2011 is being held in Melbourne from 4 to 8 July. It was moved away from the traditional March timing linked to the Australian Grand Prix to coincide with Australian International Motor Show from 1 to 10 July. As a result, we altered the timing of the Change by Design Conference to Tuesday 5 July to capitalise on the industry audience attracted by the Motor Show.

Activities planned to date are on the Events Calendar on Page 2.

Events Manager Marissa Mascaro resigned in November to further her career and we wish her success for the future. Planning, coordinating and marketing SAE-A events is a challenge covering a wide variety of subjects and activities, comprising trade nights, faculty and student seminars and professional engineering events for our diverse membership. To help deliver a successful 2010 Formula SAE-A competition we contracted Nikki Walker of Silver Moon Events to complete the organising work and we thank Nikki for her professional contribution.

I also want to thank the National Office team Felicity Wright, Rose De Amicis, Peta Dodds and Barry Oosthuizen for their commitment this year.

Finally, National Office wishes all members – and your families, relatives and friends – a Merry Christmas, Happy New Year and safe holiday. We thank you for your support throughout 2010 and hope that 2011 will be a good year for you.

Back to business

By Patrick Ross, SAE-A President

As we look back on 2010, one of the strongest signals that our industry is now fully open for business is that our market will break the one million sales units mark. And we are once again in the media spotlight, attracting a regular share of controversy as well as positive attention.

The SAE-A Board of Directors is regularly challenged, by members, industry stakeholders and the media to be become involved in the debate by taking a position or making a point. Although we fully acknowledge that this is sometimes necessary to defend the interests of our members, or to protect fundamental engineering principles, we have steadfastly remained faithful to our engineering values:

- Conclusions based on facts.
- Speak with data.
- Seek knowledge by stimulating debate.

We are resolute in our quest to ensure that the long term interests of our members take priority over short term recognition gained by media exposure. One of the key attributes of our profession is the never ending quest to solve problems permanently. One of my colleagues recently said: "I became an engineer to solve problems, so I don't have to solve them again!"

While we often have to face the reality about what is "True North", we nevertheless all have had experiences where this quest ultimately resulted in achieving a permanent positive outcome, rather than a short term quick fix. The SAE-A "5 Es" strategy of Engineering, Efficiency, Environmental Sustainability, East and Education reflects this quest by providing a foundation to enable our members, and our industry in general, to secure permanent outcomes. In this issue, it is timely to address three of the "5Es".

Engineering

SAE-A's *CareerDrive* initiative, funded by the State Government of Victoria, reflects our commitment to preserving and retaining our engineering resources. At the time of going to press, 53 of our members have enrolled in the program. SAE-A *CareerDrive* was also an active participant in a special event held by one of our corporate members, Autoliv, where we had the opportunity to assist some of their engineering and technical associates to transition to other roles. We will continue in our efforts with *CareerDrive* during 2011, with the intention to seek additional funding after the current funding expires in March 2011.

Another example of Australia's world class automotive engineering competence is that our immediate past president, Max Gillard has become the first local President of a Toyota Technical Centre. This is not only the well deserved recognition for Max's illustrious career at Toyota, but also shows that many "glass ceilings" are simply perceived. The relentless pursuit of engineering professional excellence will always ultimately secure success.

Environmental Sustainability

This is one of the most passionately debated topics on the planet! SAE-A recognises that this is deservedly so, as it impacts our long term existence. But while much of the debate is focused on finding sustainable solutions, the SAE-A Board of Directors is frequently asked to support debates that seem only to generate more hype, further detracting from long term solutions.

As engineers, we recognise our environment as a system which needs to achieve a balance between the inputs and outputs in order to achieve stability. Although the environmental agenda generally considers all the inputs and outputs, it is very concerning that some criteria are exaggerated in their contribution, ignored or dismissed to fulfil the needs of some stakeholders, often at the exclusion of achieving a positive environmental outcome.

In many cases, the media, the public, politicians and even scientists and engineers are simply making statements and hypothesis not based on fact and data, and that go unchallenged simply because no-one else knows any different.

In 2011, SAE-A will endeavour to drive the Environmental debate relating to our industry into a different dimension. We will focus on creating solutions by recognising what is known, and in particular, what is not yet (fully) known, as well as fostering a "whole of the planet" view rather than "just my town/state/electorate" view.

Education

In 2010, SAE-A held 22 events, which is 6 more than last year's total, and reached a total of nearly 2000 participants with activities in 4 states. Congratulations to our Events Committee for yet another great year, setting a very high benchmark for 2011.

In addition to our successful collaboration on some of these events with AutoCRC, we have held joint events with Swinburne University for the Plug-In 4 Power event, as well as our assessing engineers section. As I noted in the September edition of Autoengineer, our partnership arrangements for events are expected to increase in 2011, reflecting the diversity of interests and issues facing our industry and our membership.

One of the 22 SAE-A events presented during 2010 was the Victorian Government supported Change by Design Conference held in March. The safety theme presented some challenging questions to panel members (left to right) RACV Chief Engineer Vehicles Michael Case, VicRoads Vehicle Safety and Policy Manager Ross McArthur; and Bosch Chassis Control Systems Marketing Manager Mark Jackman.

On behalf of the Society, I welcome the strategic industry led research organisation AutoCRC as a contributor to Autoengineer. The first of their contributions commences on page 17. We are confident that the information they share will be of interest to the greater mobility engineering community, as is the material contributed for many years by the Federation of Automotive Products Manufacturers.

There has been much debate in the media during 2010 highlighting the significant challenges facing the industry in terms of technical and vocational skills, resulting from the major technological changes in the industry. SAE-A continues to collaborate with the Manufacturing Skills Australia organisation, which has been appointed by the Federal Government to establish Auto Skills Australia.

Of course, SAE-A acknowledges the complexity associated with establishing such an organisation, in particular considering the wide scope of interests from the key stakeholders. Nevertheless, it must also be acknowledged that the vacuum created in the provision of skills and training and has simply lasted too long. Hence the Society is actively contributing to the fast resolution of the issues inhibiting progress.

Our flagship education event Formula SAE-A took place in Melbourne from 9 to12 December. Such is its profile that it can now be referred to as a true "institution" of our industry and of many of our universities. Once again, the 2010 event featured five international teams out of the 27 entrants. This year we held for the first time a competition for EVs. While there were only two entrants, it is a significant step on the journey which mirrors that of our industry.

The SAE-A Board of Directors is also conscious that in line with the significant change in our operating environment, there is a reciprocal responsibility to ensure that we have the necessary skills and competencies on the board. At a recent Board meeting, we reviewed the necessary change in profiles required, and challenged some existing paradigms.

We will therefore take these learnings on board as we commence the search for our next President. At the same time, I would like to encourage any members who have an interest in serving on our Board to contact me or any of the other Directors for a confidential expression of interest.

On behalf of the Board of Directors, I wish all Society members and our academic, government and industry partners a safe and happy festive season.

SAE AUSTRALASIA CAREERDRIVE™

The SAE-A CareerDrive career transitioning program continues to grow, with 53 members signed-up to date.

Supported by the State Government of Victoria, you will find the hub of CareerDrive at:

www.careerdrive.com.au

CareerDrive is a holistic program, which treats participants as individuals and focuses on your particular needs. It takes you through a series of key steps, which can be revisited at any time. You can load your resume' on the website and change it at any time. You are interviewed about your need for careers coaching or skills training. Coaching, training and mentoring are provided if required.

You control your privacy and progress at all stages of the program.

We encourage members to visit ***www.careerdrive.com.au*** today!

Introducing your Board of Directors

In this edition we welcome Dr Kevin Keller . . .

I joined Ford Australia in 2008 from Ford of England and for the past few years have been actively involved in global and local ventures implementing the latest corporate technologies onto the Falcon, Territory and Ranger products. Prior to joining Ford Australia, I was the Senior Program Engineer for Electrical Engineering at Ford of England.

Qualifications > I hold a Masters of Engineering Honours Degree in Electronics and a PhD specialising in underwater robotics from The University of Liverpool.

Job title > I am the Electrical Program Node Manager for Ford Australia.

Describe the work you do > As Electrical Program Node Manager for Ford Australia, I ensure the latest technology and electronic systems are integrated seamlessly into the next generation of Ford Asia Pacific vehicles. I also ensure program requirements translate into meaningful engineering direction from the conceptual design phase through to product launch.

What do you enjoy most about the automotive industry? > Communicating with the people involved, the fast paced nature of the work and the new technologies we are integrating into our products (SYNC, Adaptive Cruise, Lane Departure Warning etc). I also enjoy leveraging commodities from global platforms, which enables me to work with international engineering teams.

What has been the most challenging/ rewarding aspect of your career? > Anticipating customer needs and delivering the engineering solutions to make them happen is certainly challenging, but it is extremely rewarding when we see the finished product meeting our customers' requirements. As the electrical launch leader on the current transit van, I enjoyed working within a highly motivated team working towards tight deadlines. I am happy to say that the team here in Ford Australia is equally as driven and a pleasure to work with.

What do you hope to bring to SAE-A as a member of the Board of Directors? > An enthusiasm for alternative fuels (LPG, Biodiesel, Hydrogen etc) and renewable energies, ranging from turbine generation systems through to solar arrays.

What are your leisure time interests? > During down time my wife and I enjoy travelling and have taken some fantastic trips both in Victoria and further afield in Australia. I am also keen at DIY projects – I can always find jobs to be done around the house!

Max Gillard appointed Toyota Technical Centre Australia President

Toyota Technical Centre Australia (TTC-AU) has announced the appointment of Max Gillard to the role of President, effective 1 January 2011. His appointment is a milestone for Toyota globally, as he will become the first local (non-Japanese) President of a Toyota Technical Centre.

Max Gillard has been Vice President and Executive Director of TTC-AU since 2004 and is a former President of SAE-A and remains on the Board of Directors as Immediate Past President.

Before joining TTC-AU, Max Gillard spent 26 years with Toyota Motor Corporation Australia (TMCA) serving in a variety of senior management positions in engineering design, product planning and purchasing, before joining TMCA's Board of Directors in 2004. He will replace Kei Oyamada who will return to Japan to work for Toyota Motor Corporation after three years with TTC-AU.

Located in Notting Hill, Melbourne, TTC-AU is one of five Toyota Technical Centres around the world and the only one in the southern hemisphere. It performs specialised operations, is a key contributor to the development of innovative vehicle designs for Toyota's global regional markets, and is involved in fine tuning models for Asia and Australia. More than 150 employees work on a range of local, regional and global projects across all stages of the vehicle design process.

SAE-A Immediate Past President and career Toyota engineer Max Gillard has been appointed President of the Toyota Technical Centre Australia.

SAE–A launches 1927 Founders' Award

To recognise distinguished achievements in Australian automotive engineering of individual Society members, the Membership Committee of the Board of Directors has introduced the *SAE-A 1927 Founders' Award.*

The Founders' Award is a 1927 Commemorative Australian florin coin mounted on an engraved plaque. That date marks the formation of the original body that grew into today's SAE-A.

Founders' Award nomination invitations will be issued each year in February and submissions must be received by 31 March of the same year. Nominations may be made by any financial SAE-A member, such as academic, company or industry association colleagues of the nominee.

Examples of the categories of achievements considered include:

- Long and successful career in the automotive industry.
- A specialist contribution to a particular sector in the automotive field.
- Leadership/direction of a defined project.
- An innovative/creative design concept.
- A high technology manufacturing system.

The Founders' Award will be made annually, provided eligible candidates are nominated, and the presentation will be made at the SAE-A AGM Networking Dinner or another major SAE-A event. Submissions must be made on the official application form and include a citation in support of the nomination. Visit www.sae-a.com.au for details.

Dr Xu Wang elected a Fellow of the SAE-A

Dr Xu Wang, a Senior Lecturer in the School of Aerospace, Mechanical and Manufacturing Engineering at RMIT University, has been elected a Fellow of the Society for his contribution to academia and to the industry through research.

Formerly he was GM Holden Commodore power train NVH Specialist Engineer, NVH Specialist in Europe for the Porsche Cayenne air spring suspension system, and project leader of the AutoCRC Carpet Acoustics project.

Xu Wang received his PhD in Mechanical Engineering from Monash University in 1994 and has published more than 50 peer reviewed conference and journal papers, books/book chapters and patents.

Five minutes with > Paul Keen

Describe the work you do > I am responsible for the success and performance of Air International's Australian business and a member of Air International's corporate global team.

What do you enjoy the most about the automotive industry? > I have been in the automotive industry all of my working life and having lived and worked in automotive in three countries and performed automotive business across most countries that have an automotive industry. This has provided me with the opportunity to develop my global career. It has also allowed my family to live and experience other nations and cultures. Few other industries in Australia would have offered such opportunities. The world class experience and expertise we have gained enables our business to flourish in supplementary high growth non-automotive areas.

What has been the most rewarding aspect of your career? > Establishing our technical centre in Shanghai for which we faced challenges in dealing with a very dynamic results focused industry and recruiting and managing a very dynamic and highly motivated technical team of local staff from a vastly different culture to my own.

What has your association with SAE-A given you? > Good insights into automotive technical trends globally, including through SAE USA, and the networking capability through industry peers locally.

What are your leisure time interests? > Time with my family, developing and maintaining our property in the Dandenongs and golf when I get the opportunity.

Paul Keen, General Manager of AITS Australia is our guest member for this issue.

Membership update

New Members

First Name	Last Name	State	Member Grade
Aldeida	Aleti	VIC	Student
George-Eric	Amparis	VIC	Member
Ahmud	Auleear	WA	Student
Hamad	Babhair	NSW	Student
Daniel	Bartos	NSW	Student
Russell	Beath	ACT	Member
Kevin	Bingham	NSW	Student
Jarred	Bismark	QLD	Student
Joshua	Boyle	QLD	Student
James	Bradley	NSW	Student
Jonathan	Broughton	WA	Student
Christopher	Bullard	SA	Student
Timothy	Collins	NSW	Student
Oliver	Couch	NSW	Student
Adrian	Cowan	VIC	Student
Thomas	Cran	QLD	Student
Michael	Demertzi	NSW	Student
Chethana	Dharmatilake	VIC	Student
John	Do	NSW	Student
Christopher	Doumbos	NSW	Student
Jason	D'Silva	NSW	Student
Jason	Edwards	VIC	Student
Matthew	Femino	VIC	Student
Angus	Fitzpatrick	VIC	Student
Declan	Ford	NSW	Student
Simon	Fransen	NSW	Student
Stuart-Ross	French	QLD	Student
Christopher	Gill	NSW	Student
Edward	Hackney	NSW	Student
Rodney	Harris	NSW	Student
Heydon	Harvey	QLD	Associate Member
Kirsty	Heiner	WA	Student
James	Hepton	WA	Student
Andrew	Hetherington	NSW	Student
Annabelle	Hill	ACT	Student
Elias	Hkeik	NSW	Student
Stephen	Hunter	VIC	Student
Stephen	Irish	QLD	Student
James	Isdale	QLD	Student
Kirsty	Jarrett	QLD	Student
Maximillian	Jeffries	ACT	Student
Hamish	Johnstone	NSW	Student
Leigh	Jones	ACT	Student
Natasha	Kelaher	NSW	Student
Brodie	Kilkenny	ACT	Student
Daniel	Lamb	New Zealand	Student
Benjamin	Landolina	VIC	Student
Eric	Lee	NSW	Student
Dane	Lilly	WA	Student
Pengcheng	Liu	New Zealand	Student
Jia	Liu	NSW	Student
Yu Shan	Liu	NSW	Student
Brogan	Lowe	NSW	Student
Adam	Lucas	NSW	Student
Jacob	Marshall	ACT	Student
Jordan	McCulloch	NSW	Student
Brayden	Mead	NSW	Student
Indika	Meedeniya	VIC	Student
Santo	Merlo	VIC	Student
Thomas	Millear	QLD	Student
David	Moloney	NSW	Student
Joel	Moses	VIC	Student
Kevin	Murphy	NSW	Student
Wayne	Murphy	VIC	Student
Benjamin	Neville	QLD	Student
Michael	Newton	WA	Student
Ki Chun	Ng	VIC	Student
Cong	Nguyen	NSW	Student
Julian	Palmer	NSW	Student
Grant	Paproth	SA	Student
Simon	Perdriau	NSW	Student
Keith	Pick	SA	Member
Tyler	Plowright	NSW	Student
Jeremy	Poh	VIC	Student
Stephen	Poulos	NSW	Student
Stephanie	Power	ACT	Student
Nicholas	Quigley	WA	Student
Paul	Rainsford	WA	Student
Ally	Ribalko	NSW	Student
Peter	Ringwood	NSW	Student
David	Robertson	VIC	Student
Cassandra	Rogers	NSW	Student
Benjamin	Ryan	NSW	Student
Jay	Sampson	QLD	Student
Julien	Seno	NSW	Student
Martin	Smith	NSW	Associate Member
Stefan	Smolenaers	VIC	Student
Tonny	Soetano	NSW	Student
Jonathan	Stables	NSW	Student
Brendon	Stacey	NSW	Student
Daniel	Stojanovski	NSW	Student
Daniel	Sugo	NSW	Student
Dougal	Sully	VIC	Student
Sean	Supierz	WA	Student
Kirk	Sweeney	New Zealand	Student
Benjamin	Swinn	QLD	Student
Kara	Symes	WA	Student
Bryce	Tacken	WA	Student
Nathan	Tarlinton	NSW	Student
James	Taylor	QLD	Student
Vu	Tran	VIC	Student
Matthew	Vodicka	NSW	Student
Kevin	Wang	NSW	Student
Jason	Whittle	VIC	Student
Paul	Wilkinson	New Zealand	Student
Luke	Williams	WA	Student
Cale	Wilson	NSW	Student
Jo-Anne	Wriede	QLD	Student
Anthony	Zanatta	NSW	Student

Upgrades

First Name	Last Name	State	New Grade
Nathan	Burke	NSW	Associate Member
Xu	Wang	VIC	Fellow

Plug-in 4 Power seminar

Recent developments in electric vehicle technology were showcased at *Plug-in 4 Power*, a joint seminar held in October and organised by Swinburne University, the AutoCRC and SAE-A.

Held at Swinburne's Hawthorn campus and opened by Greens MP Adam Bandt, the event brought together representatives from government, universities, car manufacturers and the community.

Swinburne researcher and Plug-in 4 Power chair Prof Ajay Kapoor said the aim of the event was to accelerate the use of electric vehicle technology by Australian industries. "One of the main intentions behind the event is to facilitate research collaborations and provide networking opportunities for the many stakeholders involved in the creation of sustainable transport," he said.

A feature of the event was an exhibit of electric vehicles, including GM Holden, Toyota, Nissan, Mitsubishi, Subaru, Mercedes and an Australian Blade Electron Mk IV, and electric Formula SAE-A cars built by Swinburne undergraduate and TAFE students were also on display.

Presentations were made by GM Holden's Richard Marshall, SIM Drive's Soichiro Fukutake from Japan, Hefei University of Technology's Prof Huifang Kong from China, Better Place Australia's Tim Watts, Mitsubishi Motors' Ashley Sanders, the Department of Infrastructure's Jon Real, CSIRO's Tony Hollenkamp, and RMIT University's Professor Simon Watkins led the panel discussion.

The Swinburne University Hawthorn campus Atrium was the venue for the inauguration of the Plug-in 4 Power Electric Vehicle seminar convened in collaboration with AutoCRC and SAE-A.

A delegation from Hefei University also signed a Memorandum of Understanding with Swinburne to collaborate on a research and development project on lightweight battery charged electric vehicles, which is funded by an AutoCRC grant.

Gaseous Fuels Coalition progress

In addition to his duties with Westside Corporation, SAE-A Director Tim Car represents the Society with respect to various activities relating to the gaseous fuels industry. Following a recent meeting of the Gaseous Fuels Coalition, he reported that the group is proposing a Low Carbon Incentive program to be introduced to government.

The program would detail a transitional plan to replace traditional road transport fuel with alternative fuels and drive train technologies. Key elements of the program would be improving fuel security and reducing green house gas output of road transport to a government target date of 2020. The key targets will be up to 50% replacement of traditional fuels achieving a 5% reduction in CO2 emissions by that date.

A draft paper is being prepared for industry consultation before circulation to government.

In addition to SAE-A, the bodies engaged in the program include the Australian Automobile Association, Australian Transport Association, Australian Liquid Petroleum Gas Association, Federal Chamber of Automotive Industries, Natural Gas Vehicles Australia, Energy Networks Association, Truck Industry Council and Mark McKenzie of Rare Consulting, who is assisting the coalition with the paper.

SAE-A child restraint symposium

The child restraint systems symposium convened in Melbourne recently enlightened the specialist audience on the range of products available on the world market. It was noted that many markets had adopted their own design variations.

Progress is being made on adopting an Australian system using an ISOfix or Latch design. The work invested in such projects and the scheduling required to adopt changes to the Australian Design Rules was discussed.

As with most SAE-A events, a healthy debate on design and engineering principles was facilitated. The Society thanks former Director Andrew Sansome, who stepped in as master of ceremonies at late notice.

Monash University – Formula SAE-A winners again

By Barry Oosthuizen, SAE-A Editor

Back–to-back wins in any form of competition are rare, but winning consecutive Formula SAE-Australasia events is a significant achievement. Well done to Monash University Motorsport for claiming the title for the second year running.

Monash Motorsport won first place in all dynamic events, including skid pad, acceleration, autocross, and endurance. They also won the combined endurance and economy event and the prestigious FISITA Engineering Excellence Award.

Monash Motorsport was the clear winner, scoring 871.1 points to beat Swinburne University with 759 points and Sophia University from Japan with 702.9 points.

Long known for their “winged warriors” developed in their University’s wind tunnel, the latest M10 model is an evolution of the racer that won the Australasian event in December last year and achieved a podium finish at Formula Student in the United Kingdom in July 2010.

Monash Motorsport Chief Engineer and final year Mechanical Engineering student James Michaud was confident of the team's ability to stand up to the competition and retain the trophy. "The new car is lighter and faster than last year's, but most importantly retains the reliability that enables us to push it to the limits and find the performance edge. The new car features greater suspension adjustability, a new braking system, lighter aerodynamics package and a more fuel-efficient engine,” he said.

The second place Swinburne University car achieved the fastest lap on the race track with V8 Supercar driver Tim Blanchard at the wheel. Swinburne has participated in Formula SAE-A since 2000 and came sixth that year making it to fourth place in 2002. This year the mechanical engineering students at Swinburne entered a petrol engine racer and an electric car.

On their third visit to the Australasian event a third place rewarded the team from Sophia University in Japan. The team developed a supercharged engine and also focused on aerodynamics with a unique rear wing that could “dump” down force load for improved speed.

A total of 27 teams competed in the four day engineering education competition held at Victoria University Werribee campus, near Melbourne, including seven international teams representing universities in India, Korea, and the USA, with Japan and New Zealand sending two teams each.

The competition includes three static events and four dynamic events. Representatives from industry judge the students on their designs, a complete costing analysis of the vehicle, and a theoretical business presentation aimed at producing 1000 of the vehicles per year. Once the teams pass the rigorous scrutineering checks they compete in acceleration, skidpan, sprint and race track endurance events.

The fast and reliable Swinburne University entry was both an elegant design and a scorching performer – here just lifting the inside rear wheel as the driver accelerates around the cones on the skid pan.

Melbourne’s patchy summer weather visited both sun and rain showers on the larger crowd of competitors, academic advisors and team supporters. Thanks to the experience and professionalism of the 200+ volunteer work force that makes this extraordinary learning experience happen each year, Formula SAE-A 2010 was a success. For full results visit Formula SAE-A on the Society website.

SAE-Australasia looks forward to seeing more teams putting more diverse and innovative technologies to the test in 2011.

Solid engineering and steady performance throughout the seven event competition put the Japanese team from Sophia University on the podium. Formula SAE-A photos courtesy of JJ’s Photography.

Formula SAE-A Technical review

By Pat Clarke, Formula SAE-A Senior Design Judge

Design Patron Ron Tauranac AO (right) and I checked out the economical "bent pipe solid axle" technology used at both the rear and front of the University of NSW Australian Defence Force Academy car.

It was clear that the global financial crisis materially affected many of the entrants at the 2010 Formula SAE-A competition held at Victoria University Werribee Campus near Melbourne in December. Here is a sample of the technical delights seen in the Formula SAE-A paddock. There was certainly more technical innovation there than will ever be seen in the pits at Bathurst or Albert Park.

Drive train

One tell-tale was the number of teams using a spool drive rather than a differential. A spool is an easy way to save about $1000 and reduce both rotating and total mass. Logically, one would suspect that a spool drive would compromise a car's ability to change direction. But by careful design that disadvantage can be virtually eliminated. There were at least 6 cars at Werribee with spools, including overall winner Monash University – *See Figure 1.*

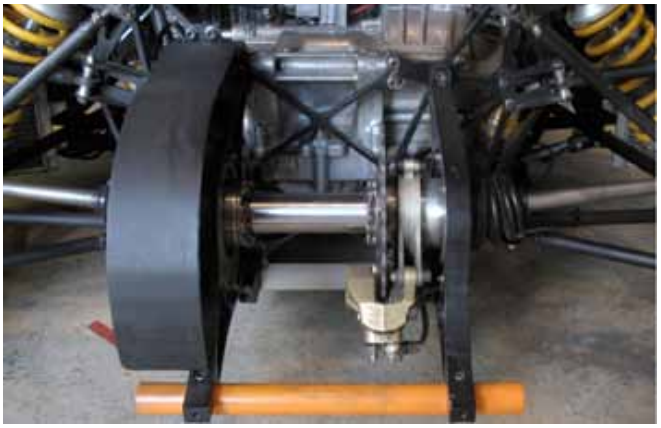


Figure 1 > The winning Monash University car shows off its spool drive. The simple structure can be seen with the drive sprocket mounted on one end and the rear brake disk mounted on the other. Cars fitted with differentials are usually fitted with two rear brakes to avoid braking across the differential.

The pretty blue car from Auckland University won the Design section of the competition. This car had a unique power-train solution with a single cylinder Yamaha engine driving through a student built carbon fibre transaxle – *See Figures 2 and 3.* The input shaft passes through the transmission where a chain and sprocket drive the output pinion shaft back to a crown-wheel and from there to the drive wheels. Changes in final drive ratio can be made by changing sprocket sizes. Unfortunately, in the dynamic events, the alloy crown wheel housing cracked causing a retirement.

Figure 2 > The Auckland University drive train with student built carbon fibre transaxle. The Calspan decal represents the California test centre where a consortium of teams commissioned testing on tyres appropriate for Formula SAE.

Figure 3 > A crack in the alloy transaxle housing (on the left), the chain drive and the tripod housings are shown here.

RMIT University entered an internal combustion engine car and an electric vehicle. The ICE engine team abandoned their usual Yamaha single cylinder engine for a twin cylinder snowmobile engine driving through a modified Ducati gearbox – *See Figure 4.* This car showed the usual RMIT design flair and attention to detail and finished second in the Design Competition. Unfortunately, tuning issues prevented the car from completing the Dynamic events. The whole car weighed 180Kg, about 30Kg lighter than the similar single cylinder car from Auckland.

Figure 4 > The RMIT University internal combustion car featured a twin cylinder snowmobile engine.

Electric power

Electric cars were entered by Swinburne and RMIT and both Universities also entered second cars in the internal combustion engine division of the competition. The Swinburne entry was actually their 2009 Formula SAE-A car re-engineered to take a 60Kw motor. They had repeated difficulties convincing the scrutineers of the safety of their car and so did not compete in the dynamic events.

The RMIT electric car was a different proposition, having advanced technology fitted to a rudimentary steel chassis. This is not what we are used to seeing from RMIT. The car used two motors and controllers. Inputs from sensors, including a steering angle sensor, permitted the team to torque vector the motors to improve cornering performance – *See Figure 5.*

Figure 5 > The RMIT electric car performed well in some sections and actually completed more events than the RMIT internal combustion engine entry.

Suspension

The Australian Defence Force Academy brought the latest iteration of their de Dion axle car. Despite being a little heavy, this car reached the Design Finals – they submitted the best Design Report – and the judges were impressed with the innovative design ideas and the students' knowledge of their systems – *See Figure 6.*

Figure 6 > This picture shows the workmanship in a rear suspension upright on the ADFA car. The de Dion axle can be seen, along with the toe control link and the Hall Effect wheel speed sensor, part of the traction control. It also shows some scuffing at the top of the upright caused by compliance in the assembly permitting contact with the wheel.

There is so much to see that is new each year at FSAE-A, that it is easy to overlook some wonderful efforts by students. A good example is the University of Sydney car. At first glance it looks "just another car", but a close inspection reveals some very interesting features – *See Figure 7.*

Figure 7 > Notable features on the University of Sydney car are the carbon drive shafts bonded to alloy flanges. The inner and outer couplings are polymer rings that will accept angularity, but which also absorb driveline snatch. The spun aluminium wheels, aluminium welded upright member and the scalloped inboard disk brake are all examples of the students' own work. Even the load paths in this assembly look good, something not always seen in a student designed car.

Brakes

Last year, Monash University introduced vertically mounted brake master cylinders to the competition and this year at least four other teams followed suit. Compared to the more normal horizontal mounting, this solution permits a shorter installation, which reduces chassis length – *See Figure 8*.

Figure 8 > The brake master cylinders on the Monash University car are mounted on a trunnion at the top of the pedal and on an adjustable balance bar at the bottom.

Chassis

Deakin University from Geelong brought the latest in their "Sidewinder" cars. This one featured an asymmetric chassis with the engine mounted to the outside of the chassis – *See Figure 9.* Dry break connections permit fast changes of the single cylinder KTM engine without spilling fluids.

Figure 9> Deakin University team discovered that a spool drive does not work well with their "Sidewinder" chassis due to the centralised mass making it difficult to design in the required weight transfer.

Among the visiting teams, the best finisher was overall third placed winner Sophia University from Japan, who were on their third visit to Australia. This car was one of two with "live" aerodynamic down force, having the aero load fed directly into the wheels. Monash University was the other. The Sophia wing was mounted on carbon fibre struts and an additional feature was spring loaded arms that allowed the wing to blow backwards at speed, therefore reducing the aerodynamic drag when down load was not required – *See Figure 10.*

Hidden from view beneath the driver's seat is an engine driven supercharger. This system draws air through the mandatory 20mm restrictor and supplies it via an intercooler to the engine. The restrictor ensures there is no meaningful increase in top end power, however, cylinder filling at less than full throttle is improved, thereby increasing low end power. This helps overcome the added load of aerodynamic drag.

Figure 10 > Interesting features on the Sophia University car are the full length ground effects tunnels and the ride damper mounted between the suspension bell-cranks.

The FAPM year that was

By Richard Reilly, Chief Executive Officer,
Federation of Automotive Products Manufacturers

This time last year there was still a sense of uncertainty within the automotive components sector in Australia. The Global Financial Crisis was hovering and more particularly in our industry, we really were in a crisis due to the lack of volume of vehicle production. This sense of uncertainty permeated the sector.

During 2010 however, we saw some serious "Hella" type light at the end of the tunnel. The mood has altered for the better, with companies embracing change, continuing to run lean operations and manufacturing volumes increasing.

There have been some tremendous new investment announcements from our passenger motor vehicle colleagues:

- **Toyota Australia** announced a $300 million investment to manufacture the next generation engine for its locally produced Camry and Hybrid Camry sedans.
- **GM Holden** secured an export program to Brazil and as of September 2010, began recruiting additional staff for the re introduction of a second shift at its South Australia manufacturing plant.
- **Ford Australia** announced an investment of $20 million for an environmental and technical upgrade of its Geelong casting plant, securing the jobs of 100 people and creating 50 new positions.

We in the supply chain applaud these investment decisions for obvious reasons. They give the industry an added sense of confidence and purpose and a clear manufacturing outlook, one that encapsulates growing domestic and global volumes, as members seek to enter global supply chains.

The FAPM's role is to represent its supply chain members as best it can. This might take on a number of guises, including liaising with Federal and State governments, representing the industry on various committees and panels, and providing member services, including statistical information, industry intelligence, information sharing, and networking opportunities. We have more to do in all these areas and will continue to develop and improve our service offering in 2011.

A look forward to 2013

We have a busy future planned for the FAPM. In August this year, the FAPM Executive Council participated in a facilitated strategy meeting organised by the FAPM Secretariat. This productive session delivered a clear view of the proposed activities going forward. From this meeting, the Secretariat prepared a new business plan that has subsequently been approved by the Executive Council, taking the organisation to 2013.

The business plan highlights the key areas of focus for the organisation to 2013. These are:

- **Government policy and thought leadership** – to continue to have input into automotive policy development and be recognised as a provider of thought leadership on automotive issues.
- **Development of a Services Portal** – develop a "best in class" web services portal.
- **Marketing and Networking** – improve and increase the marketing activities and networking opportunities for members.
- **Maintain and enhance relationships** – with the vehicle manufacturers and key stakeholders.
- **Diversification** – engagement with other industries and encourage diversification of the supply chain.
- **Merge/acquire for growth** – explore possibility of merging FAPM to achieve growth and explore possibility of acquiring another organisation for growth.

These areas of focus are the signposts pointing to where we expect to take the FAPM for the benefit of our members. This plan is available to members at > E: info@fapm.com.au.

As part of our modernisation program, the Executive Council has agreed that the current FAPM constitution should be re-written to ensure that it is up-to-date and is a "best-practice" document. One of the key tasks of the Secretariat this year will be to consult with members on the content of the new constitution to improve the governance of the FAPM.

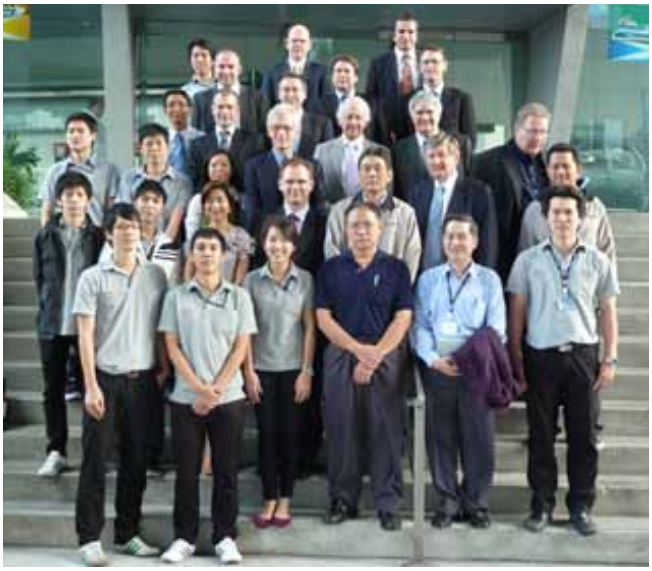
This might appear a third level issue of importance to some members, but my view is that the organisation's most fundamental documentation – its constitution – needs to be modern and relevant to an organisation representing many different sorts of companies within the one industry. Initial work has commenced on this job, but a lot more will need to be done in 2011.

The FAPM is very excited about the new phase in its life. We believe our established base in Melbourne has enabled better representation for and visibility to our members and other key stakeholders. We have a really big year ahead in 2011, with the development of the portal and the new constitution high on our list.

Automotive Components Mission to Malaysia and Thailand

The FAPM recently organised an automotive mission to Malaysia and Thailand for a week. Led by Australian Automotive Envoy John Conomos AO, the mission spent two days in Kuala Lumpur (KL) and three days in Thailand.

The mission applied for and received grant funds from the Victorian government to cover mission costs that were communal to the mission (eg: in-country bus costs, freight and the mission brochure).



A productive visit to the Isuzu facility in Thailand resulted in a comprehensive exchange of ideas and product information.

We worked closely with the Victorian Government Business Office in KL to arrange the Malaysia leg of the trip and with Austrade in Bangkok for the Thailand visits. Both these organisations did a tremendous job in arranging business to business meetings and logistics in-country. I would recommend to anyone trying to access international markets to ensure they speak to our government representatives in the target market.

The mission spent a day at Proton in KL where our participating companies all presented their credentials and heard Proton's plans for future investment. The day finished with break-out sessions so each company benefited from a one-on-one meeting with key Proton engineers and purchasing executives to discuss the components supplied by our members.

An initiative of the mission was hosting "mini-exhibitions" in both Malaysia and Thailand with each company setting up a display with banners and brochures to promote the components they made. In KL, this was set up in our hotel lobby, and people from OEMs and Tier 1 companies were invited to visit the exhibition. Again one-on-one meetings were set up to enable mission members to speak in more detail with key automotive staff from the Malaysian automotive industry.

In Thailand, the mission visited three OEMs – Toyota Motor Asia Pacific Engineering and Manufacturing, Isuzu Motors Company Thailand and Nissan Motor (Thailand). All companies were very receptive to the Australian delegation and a number of very valuable contacts were made.

Another "mini-exhibition" was held at the Hermeraj Estate in Rayon in south east Thailand. This area is very heavily supportive of the automotive industry in Thailand, with a number of OEMs having manufacturing plants on the estate. As you would expect, there is a very large number of supply chain companies in the estate to support the vehicle manufacturers.

OEMs and suppliers were invited to the exhibition and this initiative yielded some pleasing initial contacts and interest. As with any automotive mission, the contacts made on the visit will only be of benefit if they're followed up once companies return to Australia and continue to pursue the opportunities created.

Supply chain members should be aware that there are a number of trade missions proposed by various groups in 2011 and if you are interested, please contact us at info@fapm.com.au. Among the 2011 missions to be aware of include India, China and the USA.

MOU with Malaysian Industry Associations

We were fortunate to be able to sign two memorandums of understanding (MOUs) while visiting Malaysia. These were between the FAPM and the Malaysian Automotive Component Parts Manufacturers (MACPMA) and the Proton Vendors Association.

One MOU was signed by President of the Malaysian Automotive Component Parts Manufacturers Peter Lim Yoke Cheong and me while the other was signed by Proton Vendors Association President Datuk Dr Wan Mohamed Wan Embong and me. Both MOUs were witnessed by Australian Automotive Envoy John Conomos AO and His Excellency the Australian High Commissioner to Malaysia, Miles Kupa.

Signing ceremony for the Memorandum of Understanding between the FAPM and the Proton Vendors Association included (left to right) Australian Automotive Envoy John Conomos AO, FAPM Chief Executive Officer Richard Reilly, Proton Corporate Development General Manager Wan Nadzree, Proton Vendors Association President Datuk Dr Wan Mohamed Wan Embong, His Excellency the Australian High Commissioner to Malaysia Miles Kupa.

We recognise there are significant possibilities for the expansion of bilateral trade and investment between Australia and Malaysia in the automotive sector. We also acknowledge the possibility for collaborative activity and technological cooperation between our countries in this field.

Ultimately, non-binding MOUs are only as useful as the information distributed and the cooperation displayed between organisations. The FAPM is keen to foster these international linkages, with the aim of assisting members to access global supply chains.

FAPM Executive Council election

A new Executive Council has been elected by FAPM members. At the Annual General Meeting held on 20 October 2011, the following positions were elected and appointed for 2011:

President	Zoran Angelkovski
Vice Presidents	Jim Griffin Sandro Gaggini Bruce Griffiths
Immediate Past President	Barry Comben
Appointed Representatives:	
Central Region	Sandro Gaggini Greg Lowe
Northern Region	Shiromi Brell Gary Layton
Southern Region	Robert Wilson Mark De Wit Russell Jopson

In particular, we welcome onto the Executive Council two new members, Shiromi Brell from Bluescope Steel and Russell Jopson from Denso. We look forward to their contribution.

Christmas office hours

Please note that the FAPM office will close on Friday 24 December 2010 and re-open on Monday 10 January 2011. ***Have a great break.***

OzPress Pty Ltd – metal pressings and assemblies

OzPress supplies precision stamped and assembled products.

Describe your business skills and experience > OzPress began operations in 1970 as K&K fasteners. By the 1980s the company had outgrown its converted parachute-drying hut at the Ballarat Airport. A purpose built premises was built in nearby Wendouree. Growth continued and in recognition of changing goals and increasing manufacturing capabilities in precision pressings, the company began trading as OzPress Pty Ltd in 2005 and employs 32 staff.

What are your products / services and markets? > OzPress predominantly supplies the automotive customers as well as the garden care, marine and construction industries. OzPress is proud of its ability to effectively deliver quality in both product and consistent supply without compromise – or as OzPress promises: "what you want, where you want, when you want it".

Toyota Australia is the largest customer for a number of complex and precision stamped products and assemblies using a pressing capacity of 15 to 400 Tons. Modern dies on the very latest equipment ensures that products are of the highest quality at internationally competitive prices. The company recently installed a robotics system, automatic bin changing machine and an automatic rotary projection welding machine to increase efficiency and accuracy.

What has been your business's most significant achievement? > OzPress is extremely proud of the fact that they were only the second Australian company to be awarded the Regional Contribution Award by TMC at the 2007 Toyota Global Supplier conference. Other awards the company has received include the inaugural regional winner of the Victorian State Government sponsored Certificate of Excellence and induction into the Victorian Government Manufacturing Hall of Fame. In addition, the company has been recognised in the Toyota supplier awards continuously since 1997, including the 2005 Toyota Super Supplier for Zero Missed New Model Parts; the 2001, 2004 and 2005 Toyota Presidents Award for Small Business Supplier of the Year, and 2008 Toyota Presidents Award for Performance Excellence in Quality. As testament to his efficiency and cost gains, our Luke Dwyer won the 2008 Victorian Young Manufacturer of the Year Award.

What is the biggest challenge facing your business? > The OzPress team knows they compete in a very competitive global industry. A number of programs have been launched to meet this challenge, including adopting lean principles throughout the business in conjunction with Toyota production system activities. General Manager Luke Dwyer and Managing Director Mark Dwyer travel overseas extensively to search for new ideas and opportunities to increase efficiencies and enhance business operations, and to win new business.

What has your association with FAPM given you? > Being a FAPM member enabled us to participate in trade missions to Malaysia and Thailand, to attend local business networking events and to keep up to date with industry information and new ideas.

Smarter, safer, cleaner vehicle technology to benefit Australia

By Dr Matthew Cuthbertson Chief Executive Officer, AutoCRC

Welcome to the first dedicated AutoCRC section in Autoengineer. We are pleased to announce that AutoCRC will be a regular contributor to this excellent publication and we look forward to sharing the outcomes of our research activities with you.

The Cooperative Research Centre for Advanced Automotive Technology (AutoCRC) was created in December 2005 as part of a national strategy to secure Australia's position in the global automotive industry.

Since then, AutoCRC has delivered outcomes that directly enhance the viability and sustainability of the Australian automotive industry, its capability to export, and its productivity.

Over the last 5 years AutoCRC has used much of its $100 million research funding to provide the automotive industry opportunities to work with research providers in design, engineering and manufacturing to enhance Australia's global competitiveness, particularly in the following areas:

- Reduced concept-to-product cycle times.
- Improved manufacturing flexibility and efficiency.
- New material systems to meet the challenges of weight reduction, increased safety and enhanced functionality.
- Improved air quality and reduced consumption of fossil fuels.
- Safer, crashworthy vehicles and intelligent products and systems for increased comfort and performance with minimum driver distraction.

Project briefs and the contact details for our research project leaders can be found on our website > www.autocrc.com.

Strategic alliances

AutoCRC has also played a significant part in strategic research to enhance the global performance of the Australian Automotive sector:

Automotive Supplier Excellence Australia (ASEA) is a national program to assist the Australian automotive supply base to achieve world class levels of competitiveness and sustainability. It is supported by three local vehicle manufacturers, the South Australian and Victorian Governments and the Federation of Automotive Products Manufacturers. ASEA is currently funded through the Federal Government's New Car Plan for a Greener Future.

In the last year, we also developed the Automotive Australia 2020 Technology Roadmap. The Roadmap required the collaboration of over 160 Australian automotive industry stakeholders and positions Australia to implement a research and development plan that will ensure our industry maintains its global relevance in the coming years.

Senior industry executives were engaged in the development of the Automotive Australia 2020 Technology Roadmap facilitated by the AutoCRC.

AutoCRC has a strong education focus with over seventy postgraduate students conducting research into intelligent transport systems, lightweight materials, sensor processing technology, process and product optimisation and human factors. A summary of all postgraduate research can be found on our website > www.autocrc.com.

For information about how your organisation could benefit from collaborating with the AutoCRC, please contact Research Manager and Project Review Committee Chair Dr Gary White > E. gary.white@autocrc.com.

AutoCRC Student Research Award 2010

The annual AutoCRC Student Research Award was announced recently with the $1500 first prize presented to Paul Gangemi for his research into Fuel Composition Sensing. His entry was selected from six finalists who presented their research to an audience of academic and automotive industry participants.

The research pursued by Paul Gangemi looked at the design of control systems to cope with gaseous fuels that have varying stoichiometric ratios. His literature review showed that the stoichiometric ratio for Compressed Natural Gas globally varies quite considerably, and that Liquid Petroleum Gas's stoichiometric ratio is fairly consistent globally.

At the 2010 AutoCRC Student Research Award presentation Paul Gangemi (left) received the prize from AutoCRC Research Manager Dr Gary White.

He found that the stoichiometric ratio for CNG is directly related to its methane content, which led him to investigate of the use of a methane sensor and back-up oxygen sensor in the control and feedback of electronic fuel injectors.

China Australian Alliance for New Energy Vehicle Innovation

The AutoCRC has signed a Memorandum of Understanding with the China Australian Alliance for New Energy Vehicle Innovation). This Alliance is addressing the future challenges of road transport, including resource utilisation, energy efficiency and the reduction of both economic and environmental costs.

The Alliance provides a framework for joint projects between Australian and Chinese researchers and their industry partners allowing for shared intellectual property and creating commercial opportunities.

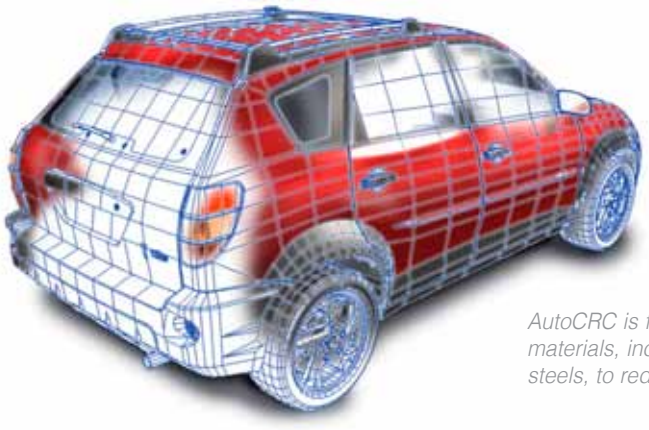
Lightweight Vehicle Research

Following several years' support for doctoral student research in lightweight components of vehicles AutoCRC has now developed a significant amount of understanding of the properties of metals foams, composites and high strength steels, including crash performance, fatigue behaviour, modelling techniques and tooling issues.

We have moved to create even more understanding of the potential for light weighting Australian vehicles through the Lightweight Modular Vehicle research project involving Swinburne University of Technology, Australian National University, RMIT University, Deakin University and VPAC.

Together these researchers are looking at novel techniques for joining new materials and vehicle design strategies for increased light material usage. It is planned to report some of this pioneering work in future issues of Autoengineer.

Other research themes supported by the AutoCRC include sustainable manufacturing, power trains, fuels, emissions, safety, intelligent vehicle systems and virtual design and manufacturing.



AutoCRC is facilitating research on the application of a range of materials, including metals foams, composites and high strength steels, to reduce weight in vehicles.

Possible use of metallic foam-filled structures for side intrusion beams

By Shigeaki Kinoshita E: shigeakikinoshita@swin.edu.au
Supervisors: Dr Dong Ruan and Prof John Beynon of Swinburne University of Technology, Australia, and Prof Guoxing Lu of Nanyang Technological University, Singapore

Increased occupant safety, fuel efficiency and greater power are a few of the demands that consumers expect of the automobile industry. Increased occupant safety and efficiency are also demanded by federal and government bodies. A recent example is the update to the dynamic portion of the Side Impact Protection (FMV214) by NHTSA in USA [1, 2]. The automobile industry has always met and continues to meet these demands, in addition to its own in-house standards.

At Swinburne University of Technology we are studying the energy absorption of "structural composites", which are structures composed of various discrete sub-structures. Some of the structures being studied are metal frames filled with metallic or polymer foams. Carbon fibre reinforced polymer structures used in conjunction with foam fillers are also being analysed.

The work presented here involved the study of aluminium foam-filled tubular structures under three-point bending tests. Alloy AA 6060 T5 was used for the tube. Although this tube type is not used in the automobile industry, the aim was to look generically at the effect of the foam filling on the overall energy and deformation profile of tubular structures.

Commercially available Alporas® closed-cell aluminium alloy foam was used for the filling. Alporas® is the trade name for the foam manufactured under licence from the Shinko Wire Company [3]. It is manufactured by introducing the blowing agent titanium hydroxide TiH2 into the molten aluminium melt [4]. The blowing agent separates into titanium and hydrogen gas, the latter forming the cavities. The foam used was purchased from Gleich Aluminium, Germany [5].

Previous work

Metallic foam is an excellent candidate for energy absorption due to its ability to absorb energy over a wide range of compressive strain. The idea is to use this behaviour of the foam to enhance the energy absorption of a structure as it deforms in a crash. Metallic foams, such as Alporas®, are also known to be sensitive to strain rate [6]. With increasing compaction speed, the compaction stress, or force, is known to increase.

Much work has been undertaken with aluminium foam-filled structures under axial crushing [7-9], targeting the use of such structures as energy absorbers in frontal impact [10, 11]. Work on foam-filled structures under bending has also been carried out, but with the majority of the work on rectangular hollow sections filled with foam [12]. Most of these studies focused on the mass specific energy absorption (SEA), the energy absorbed per unit mass of the specimen.

There is general consensus that the use of metallic foam fillings yields greater force, and hence more energy, to deform the specimen in comparison to the unfilled structure. However, as the mass of the filling is changed through its density or the amount of tube filled, the SEA of the system changes. There is an optimum density and quantity of foam before the gain in energy absorption becomes negated by the weight introduced by the foam. However, SEA does not necessarily give the overall picture on the benefit gained.

Swinburne work

Work at Swinburne has shown that with partial filling with the Aploras® foam, the structure was able to absorb greater energy in relation to the displacement of the structure. Furthermore, it was found that the strain-rate behaviour of the foam has a beneficial effect on increasing the energy absorption of the overall structure with increasing indentation speed.

Figure 1 > The thee-point bending rig using the drop weight test system.

Both experimental and corresponding numerical simulations were completed. Quasi-static tests were conducted using an MTS universal testing machine, while dynamic tests were done using a drop weight test system. The set-up for the latter is shown in *Figure.1*.

Corresponding finite element (FE) models were produced and analysed using the explicit FE analysis software package LS-DYNA. Verification of the model was carried out for both the quasi-static [13] and dynamic loading. The FE models were then used to obtain greater insight into the deformation and energy absorption capabilities of the tubes.

A visual comparison of the bent foam-filled specimen and corresponding FE simulation is shown in *Figure 2*.

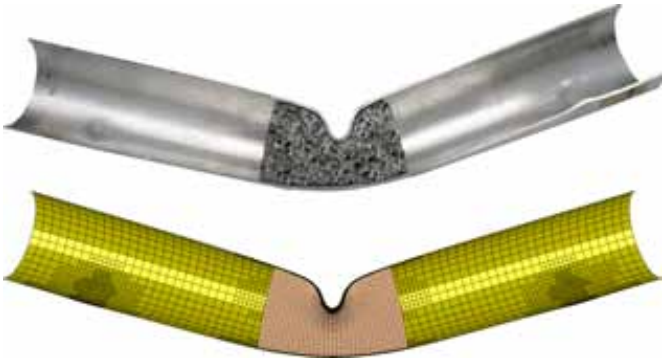


Figure 2 > Foam-filled test specimen after dynamic testing (top) and corresponding FE simulation model.

A typical comparison of the force-indenter displacement curve obtained from the experiment and FE simulation is presented in Figure 3. There is a visible difference between the experimental and simulation results for the foam-filled tubes. This is due to the difficulty in modelling the inherent variation in the foam itself, which can be seen to be coarse in its cavity structure as shown in *Figure 2.*

Findings

It was observed that with foam filling, the travel of the lowest surface of the tube was more than that of the unfilled tube. This is expected with the foam acting as a medium transferring the deformation of the top to the lower surface of the tube. However, the amount of energy absorbed by the foam-filled structure is greater than that absorbed by unfilled tubes.

In terms of a side impact bar, this means that a foam insert results in more energy absorbed for less intrusion into the passenger space. These findings were confirmed with the validated FE models. Results also showed that with greater impact speed, the strain-rate of the foam played a significant role in increasing the energy absorption of the overall structure.

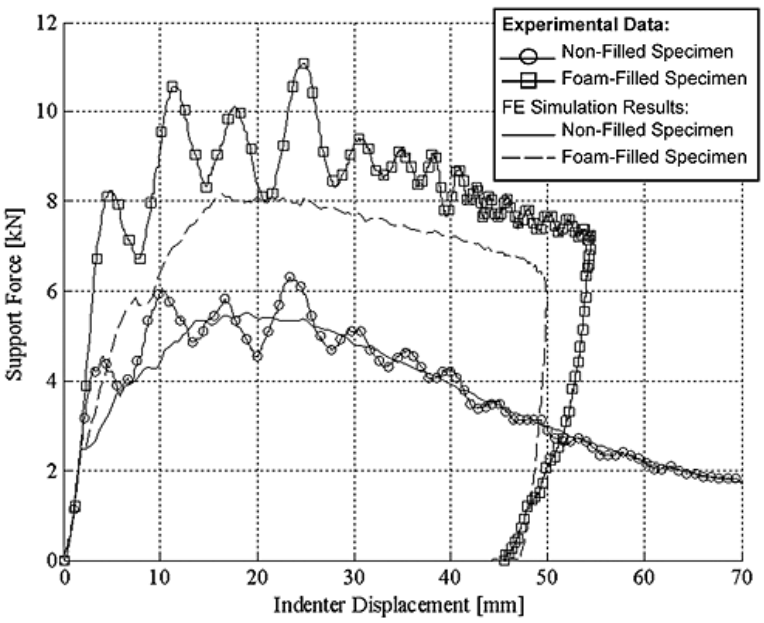


Figure 3 > Typical "force-indenter displacement" curves from experimental and FE simulation.

Acknowledgements

The author would like to acknowledge the support of the Commonwealth of Australia through the AutoCRC and Swinburne University of Technology. Acknowledgment of the collaboration in the experimental work for dynamic tests is given to Gayan Rathanwera.

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Electric vehicles – from mainstream to niche and back?

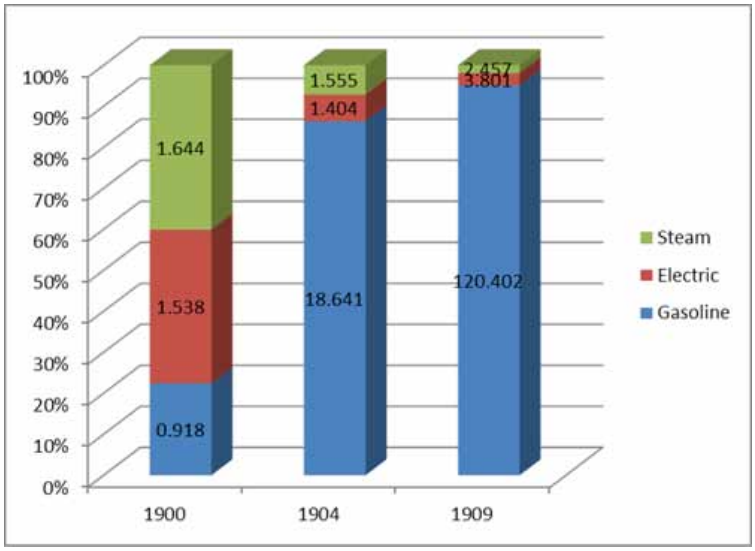
By Dr John Wormald, Managing Partner, autoPOLIS and author of Driving over a Cliff? and Time for a Model Change.

In the early 1900s, electric vehicles were mainstream. Electric motors and lead-acid storage batteries were mature technologies in contrast to the more recently developed internal combustion engine. Electric drive had everything going for it: maximum torque from standstill, no need for a multi-ratio gearbox, silence, lack of fumes, no flammable fuel, simplicity of design and construction.

At the time, cars mainly replaced horse-drawn carriages and cabs for local use, so no problem with range. Only the rich afforded them, so the cost of batteries was not a problem and the internal combustion engine had not yet come down its cost curve. Long distance land travel was by train, apart from a few heroic pioneers braving poor roads, punctures and the lack of fuelling points.

However, the internal combustion engine rapidly displaced electric drive once Henry Ford propelled it into mass production. It's a funny sort of contraption, but it works and was made from readily available inexpensive materials (mainly iron and steel), using known manufacturing techniques. *Exhibit 1* shows that displacement. The third alternative, the steam car, never stood much of a chance. The steam engine shares the attractive torque curve of the electric motor, but even with flash steam generators, the start up time was a fatal disadvantage.

Exhibit 1 > The brief reign of electric and steam cars – 1900-1909 US production volumes and shares.



Source: Time for a Model Change, G.P. Maxton and J. Wormald, CUP 2004, p. 67

But electric vehicles didn't disappear. They merely retreated into niches in which their specific properties kept a competitive advantage. These were primarily silence and the lack of fumes, in an era before exhaust catalysts. One such niche remains urban delivery, requiring many stops and starts, often in the early hours of the day, with recharging at a central depot overnight.

The classic was the British milk float, with its faint whir from the motor overwhelmed by the clank of milk bottles. A few are still around, as house-to-house deliveries were displaced by consumers driving to the supermarket. But deliveries are coming back, notably by supermarket chains in the UK mainly using conventional ICE-driven vans. The Swiss post office made extensive use of walk-behind electric delivery vehicles and the City of Paris experimented with battery-electric refuse collection vehicles.

The other major generic niche was indoor vehicles. Far the biggest application was industrial trucks. Lift trucks became universal in materials handling with the spread of palletisation. While LPG was used, compared to petrol and diesel ICEs, the numerous indoor applications of lift trucks were obvious targets for battery-electric drive.

In counter-balanced lift trucks, the load is carried in front of the front axle. So, the mass of a lead-acid battery is an advantage, even if it is an expensive counter-weight. Another well-known low volume category of indoor electric vehicles are people movers at airports.

In 2008, 487,000 electric trucks were produced world wide, although this fell to 321,800 in 2009, thanks to the recession. Of the 2008 total, 154,000 were counter-balanced fork lifts, 89,200 were rider warehouse trucks and 243,800 were pedestrian trucks, used for example, in supermarkets. (I am indebted to Frank Hopper of the British Industrial Trucks Association for these statistics).

Rising importance of the environmental issue

Faced with the twin challenges of CO2 emissions and global warming, some vehicle manufacturers and governments are showing a renewed interest in the mass deployment of electric vehicles, both pure battery electrics and plug-in hybrids. Unfortunately, they do not provide a magical technology fix. Much depends on the source of the electricity used.

The manufacturing and recycling of batteries also have environmental impacts. A detailed evaluation of the environmental impact of different driveline technologies conducted by the US National Academy of Sciences (NAS) showed that primarily electric vehicles, i.e. pure and range-extended battery electrics, will in fact consume more energy and release more CO2 than sensibly-sized internal combustion vehicles with modern engines and transmissions. This is based on the current US electricity generating mix, with its high proportion of coal.

Australia lacks the US nuclear power component and is even more coal-dependent. Very few countries have a high proportion of decarbonised electricity (nuclear, hydro and other renewables). To claim that electric vehicles are virtually non-polluting is highly misleading. The UK Advertising Standards Authority recently caused the withdrawal of a vehicle manufacturer's advertisement that made this claim. There are still unresolved safety issues with batteries. The higher their energy and power densities, the worse the problem. It's a bit like creating an energy source that's a dispersion of oxidant in a combustible fuel – otherwise known as a high explosive.

The NAS's new report on fuel economy performance and costs of alternative light vehicle technologies shows that diesel and hybrids are attractive, but primarily electric drive and down weighting with high-tech body materials much less so. The major show stopper currently is the cost of batteries. The additional cost of the battery in a hybrid, with its limited capacity, can be made affordable, particularly with rising fuel costs. The battery is merely an energy buffer, to top and tail the ICE power curve. But it only really helps in urban traffic, not on the highway.

Some of the disappointment of US hybrid owners with the fuel consumption of their vehicles is due to unrealistic test cycles, which overweight urban driving and do not include hills. Diesels, on the other hand, are more economical in almost all driving modes. Their problem is the expense of removing NOx and micro-particles from the exhaust stream.

A large battery, required for a pure or extended-range electric vehicle, is vastly expensive today, doubling or tripling the price compared to a conventionally-engined one. The hope is that mass production of batteries will bring their cost down by 80%. This may be wishful thinking, based on an inappropriate analogy with Moore's Law of micro-electronics. Integrated circuits have gone through great leaps of miniaturisation, with the ultimate limit at moving one electron. You can't miniaturise the power electronics of cars in that way.

The reality check

It is of course right to develop electric vehicles and to draw technology roadmaps. But let's not rush or get trapped in false promises. Electric vehicles will come, but only once hydrocarbon fuels become far more expensive than they are today. Even then, we shall need conventional drive trains for longer ranges and heavy-duty applications.

Deployment of electric vehicles has to be co-ordinated with that of recharging infrastructures, and with the decarbonisation of electricity generation. Technology roadmaps are extremely useful devices for identifying gaps and research priorities. But they lead to research projects, whose outcome is by definition uncertain. Honda long ago established the principle of separating Research projects – unconstrained and with no guarantees – from Development programmes, which must meet objectives.

This is especially true in a competitive mass production industry. Technology roadmaps do not cover market acceptability. Is there any significant market for electric cars today? In 10 years? With electricity taxed like motor fuels?

Nor do they demonstrate economic feasibility. Can the costs really be brought down enough? Are there viable businesses in this? Nor competition issues – how does Australia avoid being outplayed by countries with much larger resources?

There will be a host of engineering opportunities, involving a broader vision than just making better cars. But Australia needs to look very carefully at its investment choices. These are some examples of Australia's strengths in a global market place, as I perceive them – you can add others:

- The ability to design, prototype and produce complete vehicles, even in small volumes.
- Skills in light metals.
- A consistent track record in road safety.
- A strong ITS community.

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Melbourne's M1 freeway upgrade and SUNA Traffic Channel win ITS Australia Awards

By Dr Norm Pidgeon, ITS Australia President

The inaugural *National ITS Australia Award* was presented to the joint project sponsors of Melbourne's M1 freeway upgrade – Transurban Limited and VicRoads.

The *Victorian Government Road Transport Innovation Prize* was awarded to Intelematics Australia Pty Ltd for its SUNA Traffic Channel information system.

ITS Australia also recognised ITS technology researcher and developer Dr Max Lay with a *Lifetime Achievement Award.*

ITS Australia initiated the awards program to recognise the contribution made by intelligent transport systems (ITS) to creating a safer, greener, less congested and more efficient national transport system.

The ITS Australia Board of Directors heartily congratulates the 2010 winners. The judging panel was extremely impressed with the calibre of nominations for both the National and Victorian Awards.

The evaluations were based on the degree to which the nominated projects were innovative, well developed, transferable, sustainable, interoperable and had a positive impact on both the transport task and the environment.

National ITS Australia Award joint winners

The $10,000 National ITS Australia Award recognises pioneering Australian innovation in ITS products and services that encompass at least one of the themes of safety, mobility or the environment. Melbourne's M1 upgrade project featured strongly in the suite of nominations, with four separate submissions relating to this project.

The National ITS Australia Award was presented to joint project sponsors VicRoads and Transurban Limited by Gino Dompietro, ITS Group Manager for Awards sponsor Sinclair Knight Merz. In presenting the Award Gino Dompietro said: "Their applications stressed the collaborative team effort required and were submitted in conjunction with their ITS suppliers, Transmax and Visionstream, whose strong contributions were noted as critical components of success."

The $1.38 billion upgrade to the 75 kilometre M1 freeway linking the Monash Freeway, The CityLink Tollway and the West Gate Freeway and Bridge carries about 160,000 vehicles a day and key elements of the upgrade included:

- Coordinated Freeway Ramp Signals regulating traffic entering the freeway.
- Electronic Lane Use Management Signs incorporating variable speed limit displays.
- En-route Driver Information Signs providing advance notice of traffic conditions and incidents.

ITS Australia Director Gino Dompietro presented the National ITS Australia Excellence Award to joint project sponsors of the Melbourne M1 upgrade to Transurban City Link Manager Danny Elia and VicRoads M1 Upgrade Project Director John Cunningham.

- An Integrated Control System using STREAMS to manage the M1 Freeway from the central Traffic Management Centre.
- A dedicated communications system.

A preliminary study on completed works revealed significant capacity and safety improvements, and exceeded expectations with:

- Accident reductions exceeding 30%.
- Reduction in greenhouse gas emissions by 40 tonnes a day.
- Saving of 16,500 litres of fuel a day.
- Peak travel time reductions of up to 40%.
- Increased travel speeds from 79 to 87 km/h during AM peak and 50 to 85 km/h during PM peak.
- Average peak flows increased by more than 10%, with a reduction of the PM peak from four hours to less than two hours.
- A projected return of about $15 billion in community savings.

A view of the upgraded M1 Freeway technology in the heart of Melbourne's eastern suburbs.

Receiving the joint award on behalf of VicRoads, M1 Upgrade Project Director John Cunningham said: "This award is fantastic recognition for the achievements of VicRoads staff and our principal contractors, Transmax and Visionstream. Every aspect of this system had to be developed from the ground up. It has given us the ability to dynamically control traffic flows on the freeway to maximise throughput and better manage incidents."

Representing Transurban, City Link General Manager Danny Elia said: "CityLink is honoured to accept this award and pleased with this recognition of the Freeway Management System developed for the M1 upgrade. With so many projects competing for funds, the use of smart transport systems enables us to deliver effective outcomes at less cost."

Upon receiving their shares of the cash prize, both VicRoads and Transurban immediately returned their cheques to ITS Australia as seed funding for a future professional development program for young Australian ITS developers or researchers.

Victorian Government Road Transport Innovation Prize

The $10,000 Victorian Government Road Transport Innovation Prize to Intelematics Australia Chief Executive Officer Adam Game for its SUNA Traffic Channel. This Prize rewards the individual, organisation or road-controlling authority that has most benefited the Victorian community with an ITS initiative.

Former Victorian Minister for Roads Tim Pallas congratulated Intelematics Australia Limited Chief Executive Officer Adam Game for the winning the Victorian Government Road Transport Innovation Prize with its SUNA Traffic Channel.

The Intelematics Australia SUNA Traffic Channel won the Victorian Government Road Transport Innovation Prize.

The judging panel was impressed with SUNA Traffic Channel's well executed delivery of real-time traffic information to motorists, drawing on both traffic light control information and GPS probe data. This is a unique combination and provides services in various cities sculpted to the available data sources. It is excellent to see a company with its base in Victoria, now fully owned by the RACV, make such headway in world-leading solution delivery.

Intelematics Australia Chief Executive Officer Adam Game said: "We are delighted to be recognised by the ITS industry and the Victorian Government for SUNA Traffic Channel, which has revolutionised the delivery of traffic information to Australian motorists. We are continually looking to enhance the service to provide motorists and transport operators with the information they need to optimise routes and minimise delays."

Life time Achievement Award

Australian pioneer ITS researcher, project implementer and passionate advocate Dr Max Lay was recognised for his career-long commitment to the industry with ITS Australia's first Lifetime Achievement Award. When presenting the award, ITS Director Gino Dompietro said: "Max Lay was a founder of the original Australian ITS Society, helped establish ITS Australia and has been recognised internationally for his significant contributions to ITS technologies. In future this award will be known as the Dr Max Lay Prize."

Max Lay was founding Chairman of Intelematics Australia and a Director of ConnectEast. He has held many senior positions, including Executive Director of ARRB (formerly Australian Road Research Board); President of the Australian Automobile Association; Director, Deputy Chair and President of the RACV; and Principal, Sinclair Knight Merz; and has published 700 papers and high profile books.

Future Awards

Entries for the 2010 Awards represented a wide range of road management, driver information, driver safety, public transport, transport compliance and tolling applications. The judging panel represented a rich history of intelligent transport system development and delivery over the last 20 years. The panel included Max Lay, Ken Ogden, Prof Geoffrey Rose, Brian Negus, John Gardiner, Lauchlan McIntosh, and I acted as chair.

Response to the inaugural ITS Australia Awards from industry and government has been overwhelming. We will further develop this program and plan future competitions to reward our members' professionalism and to promote their skills, experience and products to the rapidly growing global market for ITS technologies.

Audible detection of approaching hybrid and petrol powered vehicles in the urban environment

A field test by Russell Manning and John Ewing, Technical Researchers for RACQ Vehicle Technologies. The authors thank Queensland Raceways and the volunteers from Vision Australia, Guide Dogs Queensland and the RACQ who contributed to this study. This is an edited summary of the comprehensive report. Readers interested in the full report should contact steve.spalding@racq.com.au.

A comprehensive field test was completed to learn whether hybrid vehicles presented more risk than convention vehicles to blind pedestrians.

Executive summary of findings

There was no significant difference in the detection distances between hybrid and similar sized conventional vehicles in a typical urban environment with typical urban ambient noise levels. This is not to say that hybrids are not a risk, only that they are no more of a risk than equivalent conventional vehicles under these conditions.

Based on the detection distances revealed in the trial, volunteers were, in about 40% of cases, unable to detect conventional or hybrid vehicles travelling at 60 km/h at a "safe" distance relative to minimum tested braking distances.

That means, when the vehicle was detected, it was closer to the subject than the minimum reaction and stopping distance required to avoid contact. Had the subject been in the path of the vehicle, contact would have resulted. In several cases, potentially serious injury or fatality may have occurred.

The lack of, or reduction in, mechanical noise from hybrid vehicles did not appear to significantly increase the risk factor. Tyre and wind noise appears to be the main auditory information available to detect an approaching vehicle. While hybrid vehicles produce little mechanical noise under certain operating conditions, they continue to produce tyre and wind noise that the volunteers appeared to identify.

While blind volunteers reported vehicles later than the sighted volunteers, they did so with greater consistency than the sighted volunteers. The blind volunteers were better able to identify the approaching vehicles from the background sound track, probably due to their training and experience.

The results recorded by the blindfolded sighted volunteers were inconsistent to the point that the data were considered unreliable and allowed few conclusions to be drawn. The sighted group was not good at differentiating approaching vehicles from background sounds. In some cases the sighted subjects appeared to be reacting to background sound cues that they believed was an approaching test vehicle. In other cases they may have been anticipating the approach of the vehicle.

KEY MESSAGES

Based on this research, hybrid vehicles present no more or less of a risk than any other quiet vehicle. Even quiet conventional vehicles can pose a threat to pedestrians in some circumstances.

The lack of, or reduction in, mechanical noise from hybrid vehicles does not significantly increase the risk factor in urban traffic environments.

Increasing noise levels of hybrid vehicles by introducing an artificial sound, as explored in other studies, in our view is not a solution. Doing so has the potential to increase the risk to pedestrians as the artificial sound coming from the hybrid could drown out or mask other quiet (conventional) vehicles by elevating the ambient traffic noise level.

All pedestrians need to be aware of the potential risks quiet vehicles of all types pose and take appropriate action to ensure their safety.

BACKGROUND

According to Vision Australia, there are currently about 300,000 Australians who are blind or have low vision. In their policy statement Quiet Vehicles Public Policy, Vision Australia suggests that this number will almost double over the next two decades. (1)

The current concerns relate specifically to hybrid vehicles, as these are perceived to be relatively common, though they represent only a very small proportion of the Australian fleet. In total, hybrid vehicles account for only about 20,000 of the approximately 15.3 million vehicles on Australian roads. (5)

It has been argued that an increase in the number of quiet cars on our roads has the potential to lead to an increase in vision impaired pedestrian injuries. The potential safety issue is likely to become more significant as very quiet plug-in electric vehicles become readily available. Virtually every major vehicle manufacturer has an electric vehicle in development, with some already released in Australia.

Motor vehicle noise is regarded as a pollutant in the same way as noxious exhaust emissions. Like exhaust gas emissions, noise is regulated by legislation. In the case of current vehicles, this legislation is Australian Design Rule 83/00 External Noise. Testing to this standard requires equipment and facilities that are not readily available.

This regulation sets a maximum noise level for vehicles, but not a minimum level. Its function is to define limits on external noise generated by motor vehicles, motorcycles and mopeds to limit the contribution of motor traffic to community noise.

A low level of vehicle noise is clearly desirable from an environmental and social perspective. However, vision impaired persons rely on vehicle-produced noise to: (1)

- Judge the amount of traffic at intersections, roundabouts and road crossings.
- Assess whether it is safe to cross a road where there are no audio-tactile traffic signals.
- Negotiate traffic in car parks.
- Tell where cars are stationary.
- Identify vehicles reversing out of driveways.

THE PURPOSE OF THIS STUDY

The purpose of this study was to determine if, under typical urban environment conditions, the distance at which an approaching vehicle can be heard varies between hybrids and similar sized current model conventional vehicles.

VEHICLE SELECTION

Vehicles chosen were a Toyota Prius hybrid and a Toyota Corolla, and a Toyota Camry hybrid and a conventional Toyota Camry. These were the two of the most common hybrid passenger vehicles on the Australian market at the time, as well as the nearest equivalent conventional vehicle from the same manufacturer's range.

Honda Civic hybrid and Honda Civic were considered for inclusion. However, vehicles were not available at the time of study. Honda vehicles cannot run on the electric motor alone and are therefore noisier than the Toyotas running in electric mode. Vehicles from the Lexus range, the only other provider of hybrid light vehicles to the Australian market at the time, were not included due to limited availability.

An electric vehicle was considered for inclusion. However, at the time of testing no production electric vehicle was available to Australian buyers. Non-production electric vehicles (modified production petrol vehicles) were rejected due to a general lack of uniformity in their equipment and specifications and limited availability.

SITE SELECTION

The test was intended to replicate as far as possible the conditions a person would experience in a car park or when attempting to cross an urban road. Ideally the test would be carried out in actual locations identified as safe crossings for the blind.

However due to the potential risks a public road or car park presented to the test participants, it was deemed necessary to use a closed, controlled venue. Lakeside Raceway north of Brisbane was selected for its safety, low background noise levels and suitable track layout.

The venue for the audible detection of approaching vehicles test was Lakeside Raceway north of Brisbane. It was selected for its safety, low background noise levels and suitable track layout.

IDENTIFICATION OF LOCATIONS THAT WERE CONSIDERED SAFE TO CROSS BY THE VISION IMPAIRED

To recreate a typical urban road crossing environment for the test at Lakeside Raceway, a sound track was recorded at a site where impaired vision persons were comfortable to cross a road. With the assistance of hand signals by blind person Gerrard Gosens, Special Projects Manager for Vision Australia, a camera was used to record the sights and sounds of passing traffic at the four way intersection. All sound readings were taken at the observer's ear height.

Only the sections of vision and sound perceived as a "safe time" to cross the road was used in a final three minute long sound track loop. This loop contained sounds of vehicles moving in all directions, as well as pedestrians and other extraneous background sounds.

REPLICATING A REAL WORLD CROSSING ENVIRONMENT

The sound track was used to replicate the sounds of the urban street location at the Lakeside Raceway test site. A sound system installed beside the roadway at the test site replayed the sound track during tests at the same sound level as recorded at the urban street crossing. This introduced noise level was higher than the natural ambient noise level at the test environment.

A sound track was recorded at a site where impaired vision persons were comfortable to cross a road with the assistance of hand signals by blind person Gerrard Gosens, Special Projects Manager for Vision Australia.

TEST ENVIRONMENT

The main straight of Lakeside Raceway was used for the test. It is a section of straight, level road approximate 450 metres long with smooth surface in good condition.

A start point was defined and an observation point was set up at the side of the track. The distance between the start point and observation point was measured at exactly 200 metres. This was sufficiently far away from the observation point that the observer would be unable to hear the vehicle commencing its run. Safety cones defined a lane to ensure the test vehicle travelled at a consistent distance from the observation point. The right side of the marked lane was 3.8 metres from the front edge of the observer's chair.

METHODOLOGY

A series of tests were conducted over two consecutive days to determine at what distance the test volunteers could hear approaching vehicles. The test was designed to replicate the conditions, as closely as practical, that a pedestrian would experience when preparing to cross a road. The test environment replicated a typical urban street location that would be used as a crossing point by the blind.

The observer faced the centre of the track, with a seat positioned 90˚ to the centreline of the track. The seat was provided because each set of tests took some time to complete and it ensured the observer stayed in the same place during all tests.

All tests were performed in the same direction with the vehicle returning to the start point via a return lane at the opposite side of the main straight. The vehicles travelled towards the observer from their left side.

Tests were undertaken at 10 km/h, 20 km/h and 60 km/h. Test speeds were selected at random from these defined speeds, so that the observer could not anticipate the likely speed of the approaching vehicle. The order in which the vehicles were presented to the observers was also selected randomly. A number of additional runs were included in the test sequences to further increase randomness.

The test vehicles were fitted with a Datron MicroSat model R20 vehicle performance monitoring system. The MicroSat was programmed to commence recording the distance travelled from the start point, defined by a GPS line, until the end point was triggered by the MicroSat operator.

Roadside observers were instructed to press a button when they were confident they could hear the approaching vehicle. The button triggered a light positioned on the track, which was in the view of the MicroSat operator in the vehicle. The operator stopped the distance recording by releasing a button connected to the MicroSat unit's brake switch port.

Reaction time for the MicroSat operator was measured using video recording techniques and used to "correct" the measured distance travelled by the vehicles. The same MicroSat operator was used in all tests. The distance corrections applied were 10 km/h = 1.2 metres, 20 km/h = 2.4 metres and 60 km/h = 7.3 metres.

The MicroSat was set to commence recording automatically at 200 meters from the observation point by using a GPS trigger line. This allowed the vehicle to be brought to the desired speed before crossing the trigger line and without providing any audible cues to the observer.

The distance at which the observer identified the approaching vehicle could be calculated by subtracting the distance recorded by the MicroSat from the 200 metre test distance, with a reaction time allowance.

Vehicles approached and passed the observer under light throttle constant speed cruise conditions in order to offer the lowest possible noise level.

OBSERVERS

The observers group comprised eleven persons five of whom were totally blind. Volunteers were selected randomly and included a mix of ages and genders. Sighted observers were blindfolded to ensure that they could identify the approaching vehicle by its noise alone.

The audible approach of vehicles was measured by sighted subjects wearing blind folds and totally blind subjects. Part of the sound system playing back the replicated urban street sounds is seen at left.

TEST VEHICLE BRAKING DISTANCES AND DRIVER REACTION TIMES

The braking distance of each test vehicle was measured at each of the three test speeds using the brake test function of the MicroSat. This information was used to determine the safe detection distances for each vehicle and test speed.

As the brake test function relies on change of speed to trigger the start point, it was necessary to also factor in driver reaction times. This involved ten video recorded tests conducted with the vehicle and to measure the driver's response time. This distance was added to the vehicle's braking distances. Distance travelled during reaction times were 10 km/h = 1.26 metres, 20 km/h = 2.53 metres and 60 km/h = 7.59 metres.

DISTANCE TRAVELLED AT THE VARIOUS TEST SPEEDS

The following are the distances a vehicle would travel in one second at the various test speeds – 10 km/h = 2.77 m/sec, 20 km/h = 5.55 m/sec, and 60 km/h = 16.66 m/sec.

Research Analysis – Hybrid vs Petrol Vehicles:

A Univariate Analysis of Variance was conducted using the SPSS program. The distance at which cars were detected by subjects was entered as the dependent variable, the sight status of the subjects (blind or sighted with blindfold) was entered as the fixed factor and the type of car used for the experiment (petrol or hybrid) was entered as the random factor for the analysis. The Analysis of Variance used a full factorial model for the analysis.

Phase 1: 10 km/h Experiment
Analysis Performed:

	Visually impaired	Sighted (blindfold)	Total
Petrol	10	16	26
Hybrid	13	18	31
Total	23	34	57

Table 1 - Number of Observations

The results in Table 2 below suggest that there is no significant difference (P > 0.05) in the audible detection of hybrid v petrol cars for people who are sighted or blind when the vehicles are travelling at 10 km/h.

Tests of Between-Subjects Effects
Dependent Variable: Distance detected

Source		Type III Sum of Squares	df	Mean Square	F	Sig
Intercept	Hypothesis	73021.561	1	73021.561	36.257	.105
	Error	2014.006	1	2014.006[a]		
Vision	Hypothesis	21892.349	1	21892.349	8.828	.207
	Error	2479.754	1	2479.754[b]		
Type	Hypothesis	2014.006	1	2014.006	.812	.533
	Error	2479.754	1	2479.754[b]		
Vision * Type	Hypothesis	2479.754	1	2479.754	1.496	.227
	Error	87865.002	53	1657.830[c]		

Table 2 - Analysis of Variance 10 km/h

Phase 2: 20 km/h Experiment
Analysis performed:

	Visually impaired	Sighted (blindfold)	Total
Petrol	14	19	33
Hybrid	12	19	31
Total	26	38	64

Table 3 - Number of Observations

The results in Table 4 below suggest that there is no significant difference (P > 0.05) in the audible detection of hybrid v petrol cars for people who are sighted or blind when the vehicles are travelling at 20 km/h.

Tests of Between-Subjects Effects
Dependent Variable: Distance detected

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	Hypothesis	72898.468	1	72898.468	61.072	.081
	Error	1193.642	1	1193.642[a]		
Vision	Hypothesis	3818.840	1	3818.840	24.034	.128
	Error	158.892	1	158.892[b]		
Type	Hypothesis	1193.642	1	1193.642	7.512	.223
	Error	158.892	1	158.892[b]		
Vision * Type	Hypothesis	158.892	1	158.892	.098	.755
	Error	97119.151	60	1618.653[c]		

Table 4 - Analysis of Variance 20 km/h

Phase 3: 60 km/h Experiment
Analysis performed:

	Visually impaired	Sighted (blindfold)	Total
Petrol	21	17	38
Hybrid	19	18	37
Total	40	35	75

Table 5 - Number of Observations

The results in Table 6 below suggest that there is a significant difference ($P < 0.05$) in the audible detection of hybrid v petrol cars for people who are sighted or blind when the vehicles are travelling at 60 km/h.

Tests of Between-Subjects Effects
Dependent Variable:Distance detected

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	Hypothesis	114043.312	1	114043.312	1026725.104	.001
	Error	.111	1	.111[a]		
Vision	Hypothesis	7023.098	1	7023.098	131.848	.055
	Error	53.267	1	53.267[b]		
Type	Hypothesis	.111	1	.111	.002	.971
	Error	53.267	1	53.267[b]		
Vision * Type	Hypothesis	53.267	1	53.267	.057	.812
	Error	66551.265	71	937.342[c]		

Table 6 - Analysis of Variance 60 km/h

Post Hoc Analysis – 60 km/h

The post hoc analysis indicates that the difference noted in the audible detection of the vehicles at 60 km/h is between sighted and blind people (Table 7 - $P<0.05$) and not between petrol and hybrid vehicle types (Table 8 - $P>0.05$).

Sighted and blind people
Distance detected

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7023.447	1	7023.447	7.698	.007
Within Groups	66604.554	73	912.391		
Total	73628.001	74			

Table 7 - ANOVA Sighted vs. Visually Impaired

Petrol and hybrid vehicle: Distance detected

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.847	1	9.847	.010	.922
Within Groups	73618.154	73	1008.468		
Total	73628.001	74			

Table 8 - ANOVA Hybrid vs. Petrol vehicles

As part of the post hoc analysis, an independent samples t-test was conducted (Table 9 below) and revealed that sighted subjects detected vehicles travelling at 60 km/h at an average distance of 48.8 metres, whereas blind subjects detected vehicles travelling at 60 km/h at an average distance of 29.4 metres.

Group Statistics

	Sighted or Blind		N	Mean	Std. Deviation	Std. Error Mean
Distance detected	1	Sighted	40	48.7787	34.74893	5.49429
		Impaired	35	29.3814	23.95615	4.04933

Table 9 - Sample T-test results 60 km/h

It was also noted that there was a considerable difference between the standard deviations in the data. Levene's Test for homogeneity of variances indicates however that the difference in sample variances is likely to have occurred due to random sampling.

In all experiments, the variance of the data was higher among the sighted subjects than the blind subjects. This led to further post hoc analysis of the data to examine the overall differences in audible detection distances reported by the sighted subjects and the blind subjects during the 10 km/h and 20 km/h experiments.

Post hoc Analysis – 10 km/h

The 10 km/h experiment revealed that sighted subjects detected vehicles an average of 57.5 metres away while blind subjects detected vehicles when they were 16.5 metres from the subject.

Group Statistics

	Sighted or Blind	N	Mean distance	Std. Deviation	Std. Error Mean
Distance detected	Sighted	34	57.5374	49.72449	8.52768
	Impaired	23	16.5139	23.23869	4.84560

Table 10 - Group Statistics 10 km/h

Levene's test for homogeneity of variances indicates that the greater variability in the sighted subject responses would not be due to sampling, F=18.557, P<0.01. A t-test based on assumed inequality of variances indicates that there is a significant difference between the mean distance the vehicles were detected t(49.941)=4.183, P<0.01.

Post hoc Analysis – 20 km/h

The 20 km/h experiment revealed that sighted subjects detected vehicles an average of 42.3 metres away while blind subjects detected vehicles when they were 26.3 metres from the subject.

Group Statistics

	Sighted or Blind	N	Mean distance	Std. Deviation	Std. Error Mean
Distance detected	Sighted	38	42.2976	45.38387	7.36224
	Impaired	26	26.3265	29.99057	5.88163

Table 11 - Group Statistics 20 km/h

Levene's test for homogeneity of variances indicates that the greater variability in the sighted subject responses would not be due to sampling, F=7.315, P<0.01. A t test based on assumed inequality of variances indicates that there is a significant difference between the mean distance the vehicles were detected t(61.952)=1.695, P<0.01.

Braking Distance Analysis

To more accurately predict the likelihood of a blind person being struck by one of the vehicles, the braking distances were analysed to find the distance within which the vehicles would be able to stop 99.9% of the time. This figure is calculated and used rather than the mean braking distance as the mean braking distance would be exceeded in 50% of instances.

In addition, total stopping distance was compared with the average stopping distance to determine, with a high degree of certainty, in what proportion of instances a subject would have been struck by a car at the 3 test speeds.

10 km/h

The response delay is added to this distance is 1.26 metres. Therefore, in 99.9% of cases the vehicles travelling at 10 km/h will be able to stop within 2.34 metres. At 10 km/h for blind subjects, in 27.09% of cases subjects would be struck. This is largely due to the very high variability in the audible detection of the vehicles.

20 km/h

The response delay is added to this distance is 2.53 metres. Therefore, in 99.9% of cases the vehicles travelling at 20 km/h will be able to stop within 4.43 metres. At 20 km/h for blind subjects, in 23.27% of cases subjects would be struck. This is due to the very high variability in the audible detection of the vehicles.

60km/h

The response delay is added to this distance is 7.59 metres. Therefore, in 99.9% of cases the vehicles travelling at 60 km/h will be able to stop within 23.39 metres. At 60 km/h for blind subjects, in 40.13% of cases subjects would be struck. This is now more due to the greater stopping distance at 60 km/h rather than the variability in the detection distances.

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Changes to consumer law affecting automotive industry

By Evan Stents,
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On 1 January 2011 the Australian Consumer Law (ACL) will come into force in Australia. The consumer guarantee of acceptable quality in the new ACL has major implications for the automotive industry as it greatly increases the rights of consumers who purchase goods which are deemed unsafe.

Where a vehicle is supplied that is not of acceptable quality as it is unsafe, the ACL now appears to give a consumer the right to choose whether they receive a full refund of the purchase price of the vehicle, a replacement vehicle of the same type, or recover compensation for the reduction in value of their vehicle. This right of the consumer to choose a remedy appears to extend to vehicles that are the subject of a safety related product recall.

Changes in the law

The ACL will provide that when goods are supplied to a consumer, there is a guarantee that the goods are of acceptable quality. Goods will be of acceptable quality if (amongst other things) they are as safe, durable and as free from defects as a reasonable consumer, fully acquainted with the state and condition of the goods (including any hidden defects of the goods) would regard as acceptable.

Where goods are supplied that are not of acceptable quality, the remedies available to consumers are determined by whether the failure to comply with the guarantee is a "major failure" or not. A major failure includes (amongst other things) where goods are not of acceptable quality because they are unsafe (although what is "unsafe" is not defined).

If the failure to comply with a consumer guarantee is not a major failure, and can be remedied, the supplier is required to repair the goods, or replace the goods with an identical type, within a reasonable time. If the supplier fails to do so, the consumer can choose its remedy as if a major failure existed.

Where there is a major failure, the consumer is entitled to choose whether they:

- Reject the goods, and receive either a full refund of the purchase price or a replacement product of the same type and of a similar value, or
- Commence legal proceedings to recover compensation for any reduction in the value of goods.

If the consumer rejects the goods, they are required to give notice to the supplier within the "rejection period", which is the period from the time the goods were supplied to the consumer within which it would be reasonable to expect the safety related defect to become apparent in that type of motor vehicle.

Implications for the Automotive Industry

The definition of goods in the ACL extends to motor vehicles and it appears to allow consumers who have purchased a motor vehicle that is "unsafe" to choose whether they receive a full refund of the purchase price or a replacement vehicle, or recover compensation for the reduced value of the vehicle.

The consumer is entitled to choose which remedy s/he receives, regardless of the scale of the defect or whether it can be rectified by the supplier. In the case of motor vehicles, the entitlement to choose a remedy does not appear to be limited by any consideration of the age of the vehicle, its value at the time the safety defect becomes apparent, or the use that the consumer has had from the vehicle.

The ACL also allows a consumer to recover damages for any loss s/he suffers as a result of the vehicle being "unsafe" if it was reasonably foreseeable the consumer would suffer loss as a result of the failure. This would seemingly extend to personal injuries suffered by the consumer, or property damage caused by the vehicle being unsafe.

The ACL may have far reaching implications for component producers where there is a safety related product recall for motor vehicles. If a vehicle recall results in consumers having the right to seek a replacement vehicle or refund of the vehicle's purchase price, regardless of the ease of rectifying the defect, then the extent of liability a component producer faces from OEMs pursuant to a vehicle recall campaign may increase considerably.

Component producers should therefore ensure that they have adequate product recall insurance coverage that takes into account the possible increased risk to component producers from product recall claims as a consequence of the ACL.

Australian students in F1 Schools World Final

Team Australia, a group of students from two high schools which have dominated the F1 in Schools World Finals Singapore 2010 was rewarded with VIP visits to the Singapore Grand Prix pits. Team Australia also won the McLaren Best Engineering Award, Best Portfolio Award and Best Collaboration Award...plus "The Ashes" against England.

The two boys and two girls from Brisbane's Pine Rivers State High School, who came second out of 25 teams from 18 nations, and three boys and a girl from Sebastopol College in Ballarat, who finished fifth, enjoyed private meetings audiences with F1 drivers Lewis Hamilton, Felipe Massa, Adrian Sutil, Kamui Kobayashi and retired racer David Coulthard.

The drivers inspected the Aussie team's mini-F1 car, which reaches speeds of 80 km/h on a special computer-timed race track, and autographed their uniforms.

Aiden Cowie and Ben Kersten represented Victorian F1 race team Basilisk Performance as part of Team Australia 2010 at the F1 in Schools World Finals in Singapore, where they met with F1 driver Lewis Hamilton during the Singapore Grand Prix.

Dassault Systèmes keeps Australian Engineering in the global game

Sophisticated Product Lifecycle Management (PLM) software is enabling Australian organisations to participate in major international projects, including engineering new automobiles, aircraft components, safer mines, seabed gas fields and warships.

Australian companies and local offices of global corporations can contribute leading edge engineering solutions working in real time with their overseas colleagues and business partners using state-of-the-art PLM software tools to design, test and produce products.

A new 2010 version of the powerful Dassault Systèmes (DS) PLM platform extends the reach of previous versions beyond on-premises solutions to connect international users within companies, or with external suppliers and other online communities. This enables users to create and share their IP and 3D experiences using common internet tools, while providing the control required in industrial companies.

The DS PLM V6R2010x package was introduced to Australia in October through a seminar series led by France-based DS Executive Vice President Etienne Droit – an internationally recognised upgrade developer of the company's state-of-the-art design software CATIA and development leader of the company's global Product Lifecycle Management (PLM) software.

Etienne Droit heads the international account management team for Toyota, Honda and Airbus, and is manager of the Asia Pacific region for DS. While in Australia, he announced significant expansion to the DS Australia New Zealand operations.

To lead the local DS team in servicing the company's 7000+ Australia and New Zealand licence holders, Gilles Cruanes was appointed Managing Director of DS ANZ. He has an MBA and 20 years management experience in DS operations in Europe, Asia and South America.

"Since the development of the first version of Dassault Systèmes 3D design software CATIA in the early 1980s, digital innovation moved to digital mock-up capability in the 1990s, and to complete Product Lifecycle Management (PLM) in the 2000s," said Gilles Cruanes.

"This fast moving digital capability has enabled an integrated global approach to product development, simulated testing and lifecycle management to bring goods and services to market faster at lower cost.

"The DS software package is now a vital enabler in keeping Australian organisations in the global engineering game. For example, DS software used by Toyota as the engineering platform for the global Toyota Camry program enables Toyota engineers in Australia to work in real time with colleagues in Japan and in the USA to develop new products and production systems," he said.

Chris Evans was appointed Solidworks software brand manager for the in the ANZ region. Further support for DS ANZ licencees includes seven specialised partners and resellers.

Australia in plug-in hybrid trial

Toyota has included Australia in a global trial of plug-in hybrid concept cars based on the petrol-electric Prius. The plug-in hybrid vehicles, equipped with lithium-ion batteries, will be shared with five local partners drawn from government and business.

Partners were chosen based on their commitment to the technology and their ability to provide feedback. The trial will provide data for Toyota and for users about the benefits and the challenges of the electrification of vehicles. The global trial involves approximately 600 cars, which have been allocated to select demonstration cities in Japan, the United States, the UK, Europe, Canada and New Zealand.

The Victorian Toyota Plug-in Hybrid trial will report on performance of first generation lithium-ion batteries.

Green Grand Prix for youth

A strong performance by Highview College made them overall winner of the human powered vehicle open section at the 2010 RACV Energy Breakthrough competition held at Maryborough, Victoria recently.

The team's Magical Indigo Love Fox vehicle won the overall event however Bendigo Senior Secondary College's team Squirrel set a cracking pace on the track during the 24-hour endurance trial, making them first over the line. The All Female class was won by St Margaret's School/ Berwick Grammar and Maryborough Education Centre and Cobden Technical School cleaned up in the Hybrids class.

The event was created in 1991 as a science, technology and environment activity to spark student interest in sustainable transport, science and technology by offering a hands-on experience.

Volunteer judges at the RACV Energy Breakthrough were (left to right) the RACV's Simon Mikedis, Henry O'Clery of LEV Automotive Partnership, Shell's Nick Lubransky and SAE-A Executive Director Max Chanter.

Airbag Anniversary: Saving Lives for 30 Years

The first series production car equipped with an airbag left the Mercedes-Benz assembly line in Sindelfingen 30 years ago: an S-Class Saloon. This brought to fruition more than 13 years of development for the first driver airbag and a new era in vehicle safety began.

Numerous studies have shown the effectiveness of airbag systems since then. US National Highway Traffic Safety Administration January 2009 report documented their great life-saving potential. Since their introduction, airbags have saved a total of 28,244 lives in the USA: 23,127 drivers (13,999 not wearing a seat belt) and 5117 front passengers (2883 not wearing a seat belt) owe their lives to the airbag.

The air bag – a life saver.

Australian Auto Aftermarket Expo – you can't afford to miss it

> The Australian Auto Aftermarket Expo to be held in Melbourne from 12 to 14 May 2011 will be the biggest and most comprehensive aftermarket trade show ever held in Australasia. It will be co-located with the separate Collision Repair Expo.

The 2011 Expo has 10% more floor space than the 2009 Sydney show and 85% of the 21,000 square metres of exhibition space is already sold six months out from the event. The Auto Aftermarket Expo has been organised on behalf of the industry every two years since 2003 by the Australian Automotive Aftermarket Association (AAAA).

The Auto Aftermarket Expo will be a "sell out" display of automotive accessories and parts, and workshop tools and equipment, and services.

"One key to the growth of this show is that it is truly run by the industry, for the industry," said AAAA Executive Director Stuart Charity. "The fast pace of exhibition space sales to major manufacturers, importers, distributors and retailers is a critical show of confidence that we have the right format for the industry's Expo.

"This is a trade only show and it is managed by a volunteer committee of exhibitors. Drawn from different sectors of the industry, they understand the exhibitors' needs. And as marketers to the industry, they certainly understand what the trade visitors want to come and see at the Expo.

"There is real competition for the remaining stand space. We encourage local manufacturers and distributors to book their stands now to avoid disappointment. This show only runs every two years and, as it alternates between Melbourne and Sydney, it will not return to Melbourne until 2015," he said.

2009 Australian Auto Aftermarket Expo exhibitor Monroe is the major corporate sponsor of the 2011 Expo.

Exhibitors profit from Auto Aftermarket Expo

The major corporate sponsor for the Auto Aftermarket Expo is Monroe. The 286 confirmed exhibitors include a "who's who" list of Australian manufacturers, importers and resellers. About 10% of the display space is allocated to international pavilions featuring products from China, Taiwan, Thailand and the USA.

Stuart Charity, AAAA Executive Director.

"Past event research proves that the Auto Aftermarket Expo is a real business opportunity for exhibitors. They report excellent traffic, lead generation and actual sales from their stands," said Stuart Charity. "This is supported by parallel research from Expo visitors. They say they attend Expo because they learn about the latest technologies and products.

"A core group of regular exhibitors has steadily grown over the five Auto Aftermarket Expos. They have learned how best to present their products. This investment is paying dividends for them in terms of the extra orders and increased profits gained through Expo exposure," said Stuart Charity.

Among those core Expo exhibitors is Pedders Suspension. "As Australia's leading automotive aftermarket undercar specialists, Pedders Suspension is pleased to return to the Australian Auto Aftermarket Expo," said Adam Gillick, Group Marketing Manager, Pedders Suspension.

"The show itself creates so many unique business opportunities for the Pedders group and for our fellow exhibitors. Automotive trade business is good business and we invite visitors at stand #Q42. This show is a must for everyone in our industry," he said.

The Expo team is planning a calendar of new activities to attract trade visitors to the 2011 Auto Aftermarket Expo. Among the attractions will be education programs, special events, dynamic displays and product launches.

Collision Repair Expo – be there

The major corporate sponsor for the Collision Repair Expo is AkzoNobel. The 40 confirmed exhibitors include a "who's who" list of Australian collision repair industry manufacturers, importers and resellers.

AkzoNobel Car Refinishes is the major corporate sponsor of the Collision Repair Expo. "The company is proud and excited to be the major sponsor of Australia's only official Collision Repair industry trade show," said General Manager Joe McFadries.

2009 Collision Repair Expo exhibitor AkzoNobel. Car Refinishes is the major corporate sponsor of the 2011 Expo.


Joe McFadries, General Manager, AkzoNobel Car Refinishes.

"This is a fantastic opportunity for us to support the industry and showcase our premium Sikkens brand, demonstrating the latest in paint technology and product efficiency. Having exhibited since the inception of the show in 2007, we encourage companies within the industry to get involved with the trade show.

"This Expo offers fantastic networking opportunities, as there are no other events in this region that bring together such a large and committed smash repair audience from across Australia and New Zealand. We are looking forward to the trade show, and are sure that it will be another successful event," he said.

Collision Repair Expo organisers are planning a calendar of new activities to attract visitors to the 2011 show. Among the attractions will be an international seminar series, the popular LowBake spray booths featuring live product demonstrations, dynamic equipment displays, product launches and conferences convened by Australian and New Zealand industry associations.

Business hubs

An unprecedented number of Australian and international industry bodies have joined the list of "supporting associations" to help promote the Australian Auto Aftermarket Expo and the Collision Repair Expo to their members. "These Expos are becoming more than an exhibition of new products and services," said Stuart Charity. "They are now important industry hubs, which encourage other industry organisations to come together to network at the Expos. These are the big industry shows – you really must be there," he said.

Exhibitor enquiries for the Expos should be directed to Tony Francis at Australian Exhibitions and Conferences at E: Tony@aec.net.au or T: 03 9654 7773.

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