ANCAP - PROMOTING BEST PRACTICE FOR SPEED ASSIST SYSTEMS (SAS)

ADVANCING SPEED ASSIST SYSTEMS
LONDON 9th MAY 2017

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OVERVIEW.

- The Australasian New Car Assessment Program (ANCAP) rates the safety of vehicles sold in Australia and New Zealand
- In 2014 ANCAP decided to align with Euro NCAP ratings from 1 Jan 2018
- This talk covers the imminent introduction of SAS in Australia as well as background on SAS research and trials in Australia
- One aim is to assist other NCAPs with the introduction of SAS in their ratings systems

JUSTIFYING SAS - TRIALS.

- Numerous trials of SAS, mainly in Europe and Australia, show positive road safety benefits and good user acceptance of the technology
- Research associated with the SAS trials, and other sources, indicate a potential for remarkable savings in killed and seriously injured (KSI)
- The savings depend factors such as market penetration, user acceptance and degree of automated control
- Euro NCAP experience (as outlined by Richard) shows that SAS can be rapidly introduced into the market

JUSTIFYING SAS - PROJECTING BENEFITS FOR OTHER REGIONS.

- The benefits predicted for implementation of SAS in Europe or Australia might not directly apply to other regions due to different speeding distributions, crash characteristics and attitudes to speeding.
- However the findings for Europe and Australia can be used to estimate the potential savings in other regions
- The following slides indicate how this might be done

JUSTIFYING SAS
DRIVER ACCEPTANCE OF SAS.

- Experience with telematics and “pay-how-you-drive” car insurance suggests that relatively small financial incentives can have a major effect on drivers' attitude to speeding.
- This iPhone app gives feedback to a young driver in the UK who could halve the insurance premium through avoiding speeding and other risks

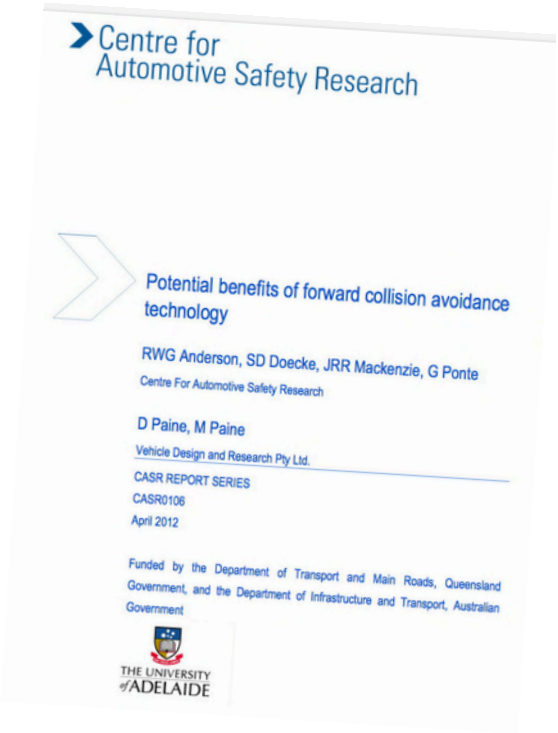
JUSTIFYING SAS
DRIVER ACCEPTANCE OF SAS.

- Prof Greaves (2015) conducted a naturalistic driving study with telematics that included an analysis of travel time savings through speeding in urban areas.
- He found that the average Sydney driver saves 26 seconds/day or 2 minute/week by speeding.

“A dramatic reduction in the road toll could be achieved through almost imperceptible increases in travel time by each driver”.

JUSTIFYING SAS CRASH RECONSTRUCTION.

- The Centre for Automotive Safety Research (CASR) in South Australia has a strong background in crash investigation and effectiveness of countermeasures.
- In 2012 they carried out an analysis of the potential benefits of autonomous emergency braking by re-analysing in-depth crash data to predict the outcome (injury risk) if AEB had intervened


Centre for Automotive Safety Research

Potential benefits of forward collision avoidance technology

RWG Anderson, SD Doecke, JRR Mackenzie, G Ponte
Centre For Automotive Safety Research

D Paine, M Paine
Vehicle Design and Research Pty Ltd.

CASR REPORT SERIES
CASR0106
April 2012

Funded by the Department of Transport and Main Roads, Queensland Government, and the Department of Infrastructure and Transport, Australian Government

THE UNIVERSITY of ADELAIDE

JUSTIFYING SAS CRASH RECONSTRUCTION.

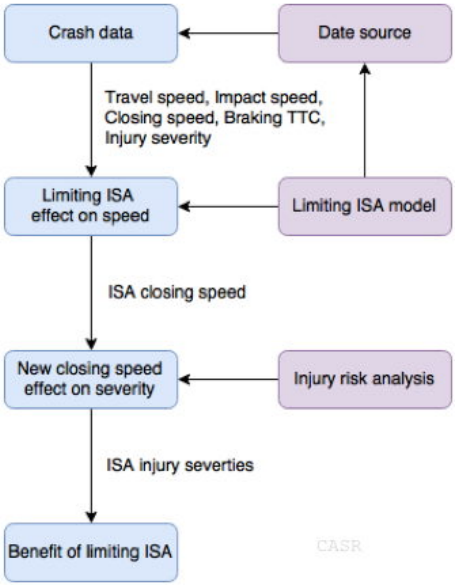
- In a recent pilot project CASR have used the same methodology for predicting the benefits of SAS. This included analysing initial travel speed and other data from electronic data recorders (EDR) that are now available through the US National Accident Sampling System (NASS)

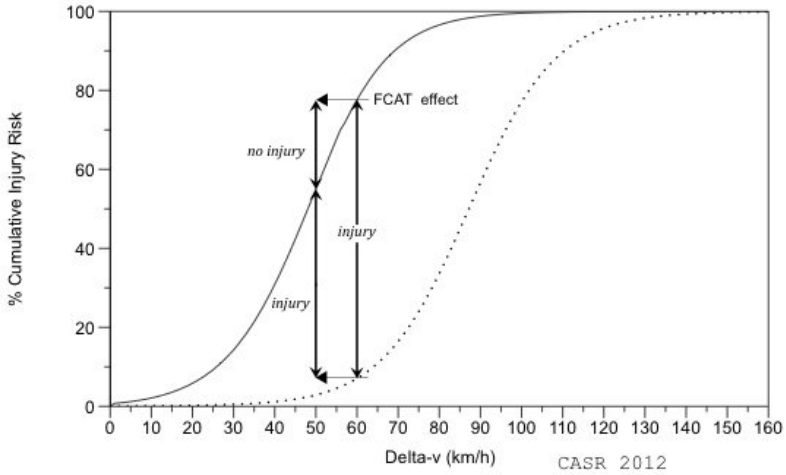
EDR download

Pre-Crash Data -5 to 0 sec [2 samples/sec] (First Record)

Times (sec)	Speed vehicle indicated MPH [km/h]	Accelerator pedal, % full	Service brake, on/off	Engine RPM	ABS activity (engaged, non-engaged)	Brake Powertrain Torque Request	Driver Gear Selection
- 5.0	51 [82]	3.4	Off	1,266	non-engaged	No	Drive
- 4.5	50 [81]	4.2	Off	1,296	non-engaged	No	Drive
- 4.0	50 [81]	3.7	Off	1,310	non-engaged	No	Drive

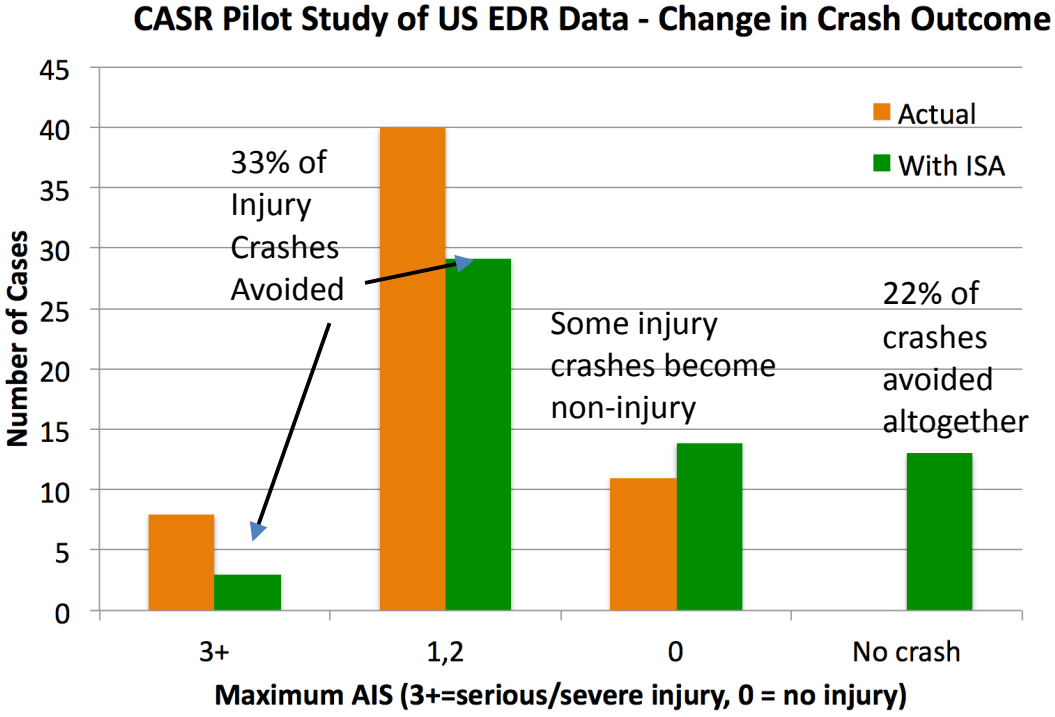
JUSTIFYING SAS CRASH RECONSTRUCTION.





- Illustrations of CASR methodology

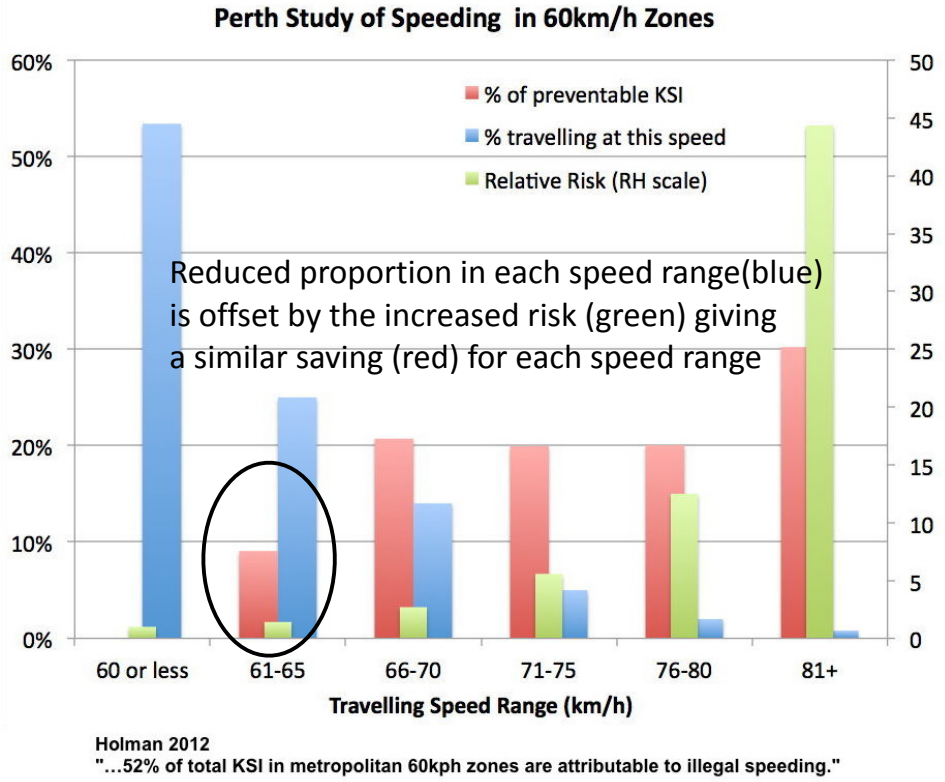
JUSTIFYING SAS CRASH RECONSTRUCTION.



- Subject to small sample sizes for this pilot study

JUSTIFYING SAS CRASH RISK & SPEEDING.

- Prof Holman from Uni of Western Australia has predicted similar KSI savings for urban roads of Perth
- Note the savings in the range of 1 to 5km/h over the speed limit (52% x 9% = 5% of all KSI)



Holman 2012
"...52% of total KSI in metropolitan 60kph zones are attributable to illegal speeding."

JUSTIFYING SAS - PROJECTING BENEFITS FOR OTHER REGIONS.

- The relative risk derived from these and other studies can be combined with the local speed distributions and crash types of other regions to obtain an estimate of the benefits of various levels of SAS

p = proportion of total vehicles travelling in this speed interval in 2010.
v = mid-point of this speed interval in kph. *Exactly the legal limit of 60kph is used as the baseline for risk assessment.
RR = incidence rate of serious crash at speed v relative to the legal speed limit of 60kph = Exp[-0.822957835 - 0.083680149*v + 0.001623269*v^2].[4]
PAR = population attributable risk in this speed interval = p*(RR – 1)/(Σp*(RR – 1)+ 1) = proportion of all KSI attributable to speeding in this speed interval.[5]

TRANSITION PERIOD - USE OF EURO NCAP RATINGS.

- ANCAP has been using Euro NCAP test results since 2000.
- From 2015 ANCAP has been publishing Euro NCAP ratings as-is (the “Euro NCAP pathway”) and so has included SAS in the Safety Assist assessment
- This has presented some difficulties due to the lack of speed limit information accuracy/availability in Australia. For this reason the SAS requirements have provisions for delayed implementation:

Performance of Australasian SAS

Concerns have been raised about the performance of camera-based and digital map-based SLIF in Australia and New Zealand.

During the transition period ANCAP will apply the Euro NCAP score for camera-based SLIF if the OEM provides a statement that the system fitted to the vehicle is capable of being tuned to Australian/New Zealand conditions and that the OEM is committed to doing this within two years[2].

During the transition period ANCAP will apply the Euro NCAP SAS score for digital map-based SLIF if the OEM provides a statement that the system fitted to the vehicle is capable of using Australian/New Zealand digital map-based speed limit data and that they are committed to implementing this within two years[2]. In this case the OEM should be prepared to demonstrate that the system works in at least one city in Australia or New Zealand as soon as possible after the model launch.

STEPS TO IMPLEMENTATION.

- Develop protocol (preferably based on Euro NCAP protocol)
- Develop test capability for assessing SAS
- Support/encourage local activities in speed sign recognition and standardisation of signs
- Support/encourage local activities in digital mapping of speed limits - includes notifying map providers of changes to speed limits
- Arrange public demonstrations of SAS to allay concerns and point out (current) limitations

STEPS TO IMPLEMENTATION.

- Encourage SAS functionality (e.g. using technologies developed for Europe) even if there is limited geographical implementation in early years (i.e provide for delayed activation of systems)
- Encourage manual speed limiting for any new vehicle that has cruise control (can use same control buttons)
- Include SAS in efforts to change driver attitudes to speeding
- Ensure that autonomous vehicles comply with speed limits!