**Institution:** University of Nottingham

**Unit of Assessment:** UoA4 - Psychology, Psychiatry and Neuroscience

**Title of case study:** Influence on National and International Road Safety Policy

## 1. Summary of the impact

Research conducted by the Accident Research Unit (ARU) at the University of Nottingham since 1988 has influenced decision-making processes for government road safety executives across the globe. A series of studies commissioned by the Department for Transport (DfT), in addition to independent research, fed into research policy-making documentation, helping to frame national and international government policy on road safety in the UK, Europe, America, and Australasia. The work has informed publicity materials for professionals and the public with a particular focus on collisions involving young drivers, motorcycle safety, work-related traffic collisions and distractibility due to roadside advertising.

## 2. Underpinning research

Detailed analysis of police collision case-files enabled the documentation of the principle accident mechanisms in major classes of road accident including those involving young drivers[1], motorcyclists[2] and commercial vehicles[3]. Further research conducted by the ARU focussed on motorcycle "look but fail to see" (LBFTS) errors[4,5] and roadside advertising[6]. The research ran from 1988 until 2009 and was conducted primarily by Prof. David Clarke and Dr. David Crundall, supported by key long-term staff Prof. Geoff Underwood and Dr. Peter Chapman and postgraduate researchers Pat Ward (1992-2009), Wendy Truman (1998-2009), Craig Bartle (2001-2009) and Amit Shahar (2007-2009). All the projects were conducted at the University of Nottingham, without external collaboration except for one (on fatal accidents) which was part of a group of three interconnected research contracts involving the Transport Research Laboratory and a multi-centre team from the University of Nottingham, University College London, University of Surrey and Swansea University. The research was also supported by several grants from the DfT (Details provided in Section 3).

Research at the ARU aimed to identify the factors contributing to various road-user accidents and comprised detailed analysis of police collision case-files, literature reviews, surveys, and experimental lab work, including the development of a novel multi-screen hazard perception test for motorcyclists, and the use of a motorcycle simulator. The research discovered that young male drivers have particular problems with loss of control on bends in single-vehicle accidents[1]; that motorcyclists are overlooked in characteristic ways by some drivers emerging from junctions[2] and that drivers of certain types of commercial vehicle are disproportionately at fault for the collisions they are in[3]. Other ARU key findings included the role of negative attitudes of car drivers towards motorcyclists in the likelihood of collisions[4] and the success of providing different video-based perspectives to improve car drivers' attitudes towards motorcyclists[5].

An eye-tracking study on a multi-screen hazard perception test demonstrated that experienced drivers were most susceptible to LBFTS hazards, as reflected in shortened fixation durations on approaching motorcycles[5]. These research findings fed directly into a number of recommendations for the DfT. Based up these reports, a video-based intervention (THINK! Biker) was devised to focus upon improving attitudes and empathy towards motorcyclists within the general public. The DfT were particularly interested in the application of the research to mass-media safety campaigns and therefore commissioned a Public Relations company to work with Dr. Crundall to develop a campaign on the basis on the research findings.

Finally, work on low-level roadside advertising investigated the ability of drivers to scan for hazards and advertisements either at street level or raised 3m above street level[6]. Findings showed that street level advertisements attracted more attention than raised advertisements when drivers were instructed to look for hazards. This highly cited finding was influential in changes to various international roadside safety policies.

## 3. References to the research

***Journal articles***

1. Clarke DD, Ward P, Bartle C. and Truman W. (2006) Young driver accidents in the UK: The influence of age, experience, and time of day. *Accident Analysis and Prevention*, 38, 872-879. DOI: 10.1016/j.aap.2006.02.013. IF: 1.964 (leading journal in field); Citations: 38

2. Clarke DD, Ward PJ, Bartle C, and Truman WA. (2007) The role of motorcyclist and other driver behaviour in two types of serious accident in the UK. *Accident Analysis and Prevention*, 39, 974-981. DOI: 10.1016/j.aap.2007.01.002. IF: 2.391; Citations: 40
3. Clarke DD, Ward PJ, Bartle C. and Truman WA. (2009) Work-related road traffic collisions in the UK. *Accident Analysis and Prevention*, 41, 354-351. DOI: 10.1016/j.aap.2008.12.013. IF: 2.391; Citations: 7
4. Crundall D, Bibby P, Clarke DD, Ward P, & Bartle C. (2008). Car drivers' attitudes towards motorcyclists: a survey. *Accident Analysis and Prevention*, 40, 983-993. DOI: 10.1016/j.aap.2007.11.004. IF: 2.391; Citations: 14
5. Crundall D, Clarke DD. & Shahar A. (2011). *Car drivers' attitudes and visual skills in relation to motorcyclists*. Road Safety Research Report No. 121. Department for Transport (DfT), London. http://www.svmc.se/upload/Se%20Oss/rsrr121mainreport.pdf
6. Crundall D, Van Loon E, & Underwood G. (2006). Attraction and distraction of attention with roadside advertisements. *Accident Analysis and Prevention*, 38, 671– 677. DOI: 10.1016/j.aap.2005.12.012. IF: 2.391; Citations: 28

***Selected Funding***

1998-2001: £399,844 from The Transport Research Laboratory / The Department of the Environment, Transport and the Regions ('DETR') for 'In Depth Accident Causation Study of Young Drivers'. PI: David Clarke RG2912.
2001-2004: £665,764 from the Department for Transport Local government and the Regions (DTLR) for 'In-depth study of motorcycle and work-related accidents'. PI: David Clarke RC2912.
2005-2006: £239,439 from Department for Transport for 'In-depth study of trends in fatal accidents', linking with partner projects at UCL and the Transport Research Laboratory. PI: David Clarke RC2912.
2006: £73,393. Department for Transport, for 'Car driver skills and attitudes in relation to motorcycle safety' (Phase 1). PI: David Crundall RC2924.
2007-2009 £468,020, funded by the Department for Transport to further investigate the skills and attitudes of drivers towards motorcyclists*).* This included experimental work, including the development of a 3-screen hazard perception testing rig, and the use of car and motorcycle simulators. PI: David Crundall RC2930.
2007-09: £197,008 from Department for Transport, via Framework Agreement with Transport Research Laboratory, for 'In-depth study of road traffic accidents involving older drivers'. PI: David Clarke RC2929.

**4. Details of the impact**

Road Traffic Collisions are the biggest cause of death amongst young people in the developed world. Behavioural (i.e. human) factors are thought to contribute to 95% of all collisions (Sabey, http://www.roadsafetygb.org.uk/news/2722.html). ARU research on road-user behaviour was one of the biggest strands of work commissioned by the DfT specifically to inform the development of government policy on road safety, with 14 contracts running from 1988-2009[a]. The in-depth studies of police files[1-3] focused on specific types of collision (overtaking, junction collisions) and the practical implications were spread over a wide range of potential collision sites, vehicle design issues, and policies for education and enforcement. The findings were passed on to safety researchers and research managers at the DfT, whose job it was to brief policy makers and ministers on the implications of those findings.

For shaping public knowledge of road hazards, this research has helped develop the Hazard Perception Test (an important part of the Theory Test for new drivers) as well as the policy on night-time training and testing of new drivers[a]. This was achieved through direct contacts with policy-makers through invited talks for 17 out of 18 annual 'research seminars' organised by DfT. These talks were also published as DfT research papers (e.g. DfT Annual Seminars 12, 17, 18 and DfT research reports 18 (Young drivers), 58 (Work-related traffic accidents) 54, 85 & 121 (Motorcyclists), 92 (Speed), 95 (Driver Distraction), 110 (Fatigue) and 112 (Public Attitudes)[b] ensuring that the research findings were reaching a wider audience. Of these reports, ARU research relating to Driver Distraction[6], Motorcyclist Safety[4,5] and Work-related Road Traffic

Accidents[3], had the greatest impact as detailed below.

**Impact of Driver Distraction and Road-Side Advertising on International Policy Changes**

As outlined above, the ARU identified some of the key dangers associated with low-level roadside advertising[6] and this research has also been cited widely in influential international policy and research reports across the US and Australasia. The ARU's work has influenced policy changes as seen in documents from:

- US Department of Transportation Federal Highway Administration[c]
- Austroads (the association of Australian and New Zealand road transport and traffic authorities comprising the six Australian state and two territory road transport and traffic authorities, the Department of Infrastructure and Transport, the Australian Local Government Association and the New Zealand Transport Agency) and Transport and Road Safety (TARS) of New South Wales[d]

**Impact of Factors affecting Motorcycle Collisions and International Policy Changes**

Despite making up only 1% of road traffic, motorcyclists account for a hugely disproportionate 21% of deaths on the road (DfT Road Casualty Statistics). Research at University of Nottingham into factors affecting motorcycle accidents[1,2] has been extremely influential worldwide, feeding into road safety reports for

- Victorian Parliamentary Road Safety Committee Inquiry into Motorcycle Safety (Australia)[e]
- The French Institute of Science and Technology for transport, spatial planning, development and networks (IFSTTAR) for the French Department of Ecology and Energy[f]
- European Science Foundation COST Action (257) on Accident Prevention Options with Motorcycle Helmets[g]

**Impact of national launch of the 'Named Rider' Campaign on awareness of Motorcycle accidents in the UK**

In order to translate the findings of factors relating to motorcycle accidents to the public, the DfT launched a radio and television road safety campaign in the UK – the THINK Biker! 'Named Rider' campaign. On the basis of research conducted by the ARU the DfT invited Crundall to act in an advisory role and to act as the scientific spokesperson for the campaign[h]. The campaign was disseminated into local information leaflets for the public citing Nottingham research on risk factors for collisions[4,i] The DfT praised Nottingham researchers for the success of this campaign in preventing deaths and accidents by their unique contribution in understanding the psychology behind failing to see other drivers.

According to the THINK! Team Head from the Department for Transport: *'Our analysis of motorcycle safety in the UK in 2009 showed that 'looked but failed to see' crashes involving cars and motorcycles continue to cause a considerable number of deaths and accidents. Previous THINK! campaigns have tackled the issue of visibility by encouraging drivers to take longer to look for bikes. This time, we sought a greater understanding of the issue by looking at the psychology behind how and why we see some objects but not others. Your work introduced us to the idea of cognitive conspicuity and helped us to develop a campaign that aims to change the way drivers think about motorcyclists in order to improve their chances of seeing them on the roads'*[h].

According to a 2010 DfT report on the Think! 'Named Rider' campaign:

"We saw evidence that the 'Named Rider' campaign had the potential to change behaviour, with the proportion of people agreeing that they 'always look out for motorcyclists' increasing significantly (from 84% to 91%)."[j]

"THINK! shaped … road safety since 2000. It estimates that every pound spent on advertising delivers a saving of round £9.36. Over the past decade, we estimate that up to 3,912 lives have been saved by the THINK! campaign. We are confident that Named Riders is more than playing its part."[j]

**Impact of Work-related Traffic Accidents on Worldwide Policy Changes**

The in-depth study commissioned by the DfT into work-related road traffic accidents[b] was cited as evidence in European policy making documents including:

- European Commission SafetyNet[k] (a European Road Safety Observatory) which supports all

aspects of road and vehicle safety policy development at European and national levels
- European Transport Safety Council[l] Reducing Road Safety Risk Driving for Work and To Work in the EU.

**5. Sources to corroborate the impact**

a. Letter from Transport and Safety Consultant from the Department of Transport
b. DfT reports by ARU: Report 18 (Young Drivers), Report 58 (Work-related traffic accidents) Reports 54, 85 & 121 (Motorcyclists), Report 92 (Speed), Report 95 (Driver Distraction), Report 110 (Fatigue), Report 112 (Public Attitudes) all available upon request
c. The effects of commercial electronic variable message signs (CEVMS) on driver attention and distraction: An update. US Department of Transportation. Federal Highway Administration, Feb 2009 Publication No. FHWA-HRT-09-018
d. The Impact of Roadside Advertising on Road Safety. Ausroads Research Report. Report No. AP-R420-13
e. Victorian Parliamentary Road Safety Committee Inquiry into Motorcycle Safety
f. Study of spontaneous driving behaviour of motorbikes users in the urban and peri-urban traffic. (IFSTTAR) for the French Department of Ecology and Energy.
g. COST Action 357 Accident Prevention Options with Motorcycle Helmets
h. THINK! Campaign letter from Team Head of Department for Transport
i. THINK! Norfolk Motorcyclist Education Leaflet citing Crundall et al (2008, 2010)
j. DfT 2010 Motorcycle safety named-riders post campaign research summary
k. SafetyNet (2009) Work-related road safety. European Commission SafetyNet.
l. European Transport Safety Council Reducing Road Safety Risk Driving for Work and To Work in the EU Report.