

Better Understanding of Road Safety Treatments

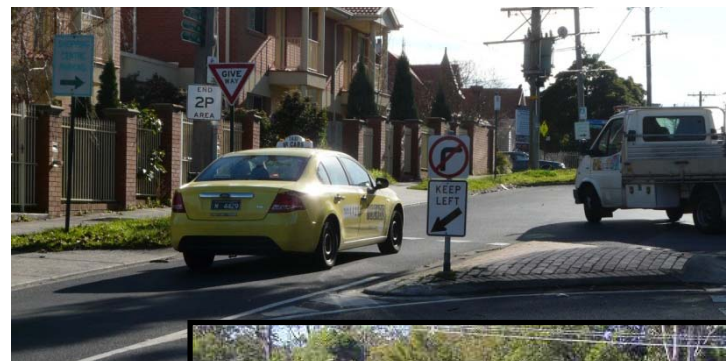
Dr Peter Cairney

The issue

- Improvements to roads and roadsides are an important contribution to reducing deaths and injuries
- Getting the best return from investment in safety treatments depends on
 - Knowledge of which situations are highest risk
 - Accurate knowledge of effects of treatments on crash occurrence
 - Whole-of-life costs for treatments
- Current knowledge of effect of treatments is inadequate
 - Road Safety Engineering Risk Assessment Project (2000-2007)
 - Acknowledged by leading authorities in the field

Reasons

- Small-scale studies, inconclusive results
- Poor study design
- Documentation of treatments and outcomes
- Limited accuracy of injury data



In-principle remedies

- Small-scale studies, inconclusive results
- Poor study design
- Documentation of treatments and outcomes
- Limited accuracy of injury data
- Combine results of studies, collaboration between jurisdictions
- Improve training of practitioners and awareness of administrators; have budgets for evaluation
- Improve training
- Improve links between crash records and medical records

Practical remedies (1)

- *Austrroads - An Introductory Guide for Evaluating Effectiveness of Road Safety Treatments*
 - Practical guide for practitioners
 - Extensive peer-review

- Unbiased estimates of effects are difficult to achieve:
 - Regression to the mean
 - Confounding variables

- Suitable study designs can do much to eliminate bias
 - Tend to be more complex (but not unachievable)
 - Require more time, budget, skill and understanding

Practical remedies (1 – contd.)

- Simple studies can still be of some use, especially if included in systematic reviews/metanalyses but adequate documentation is critical
 - treatment,
 - location
 - type of crash/injuries considered



Practical remedies (2) – Going International



- *Sharing Road Safety*
- OECD/International Transport Forum publication
- ARRB participation in the working group

Practical remedies (2) – Going International

- the complexity of the decision-making for safety interventions
- increasing dependency on reliable indicators of the effectiveness of interventions
- the fundamental importance of Crash Modification Factors and the growing demand for them
- the need for more training and regular practical use
- more extensive analyses of the circumstances under which CMFs are achieved to ensure transferability

In Conclusion

- Knowledge of the effects of road safety treatments is not as good as it *could* or *should* be
- Urgently need to improve the quality of individual studies and to set up collaborative arrangements to allow much larger studies
- Need to study treatments under a wider range of circumstances to ensure estimates of crash reductions are generalisable
- Better information about the effectiveness of treatments will lead to more accurate risk ratings and ultimately to more effective investment in road safety.

ITS and crash prevention

- Austroads project examined potential for different types of roadside and in-vehicle ITS to reduce crashes under Australian conditions
- Matched Australia-wide crash data with available evidence on the effectiveness of different types of ITS
- Benefit cost ratios very quickly out of date
- Lasting value is in identifying numbers of crashes in Australia that might be prevented by different ITS functions
- Applying CMFs to crash data provides estimate of possible crash reduction

Seat belt reminder system

- Seat belt reminder system
 - Save 110-180 fatalities, 860-1400 serious injuries
 - Value \$380-630 million
- Intelligent speed assist
 - Save 185 - 5000 injury crashes
 - Value \$90- 2,500 million

Roadway departure warning

- Camera in vehicle
- Detects contrast between road surface and edge line
- Warning sounded if vehicle begins to drift over the edge line



Roadway departure warning

- Roadway Departure Warning
 - Save 90-310 fatal crashes, 620-2100 serious injuries
 - Value \$510-1700 million
- Collision avoidance warning
 - Save 110-180 fatalities, 1500-3800 serious injuries
 - Value \$980-3800 million

Game-changer – nomadic devices

- Many of these functions are now available as nomadic devices
- ISA even available as a free phone app
- One low-cost camera could conceivably fulfil roadway departure and collision avoidance function
- Low-cost ‘plug and play’ device that fulfils many functions?
- Link to V2V and V2I infrastructure

ISA and Safe System coverage

- Low cost ISA critical for the future
- Compliance with Safe System principles through better infrastructure is possible for only a limited part of the road network in the foreseeable future
- Most of local road network ruled out on the basis of costs and cost effectiveness
- Low cost ITS is our best hope of approaching Safe System conditions on this part of the network
- Current work at ARRB is suggesting much higher serious injury risk for the most remote and most disadvantaged communities

Conclusions - ITS

- Some market-ready and emerging ITS system appear to offer considerable crash reductions
- If not already available as nomadic devices, it is possible they may be available soon
- This may be the only way in which conditions that approximate to Safe System may be available on less well-travelled parts of the road network