Better Understanding of Road Safety Treatments

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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
  – 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

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- 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)

- **Austroads - 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/metanlyses 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