



MONASH University
Accident Research Centre

A centre within the Monash University Injury Research Institute

The Road to Success: Road Policing and Public Health

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Law Enforcement and Public Health
November 12, 2012



Overview

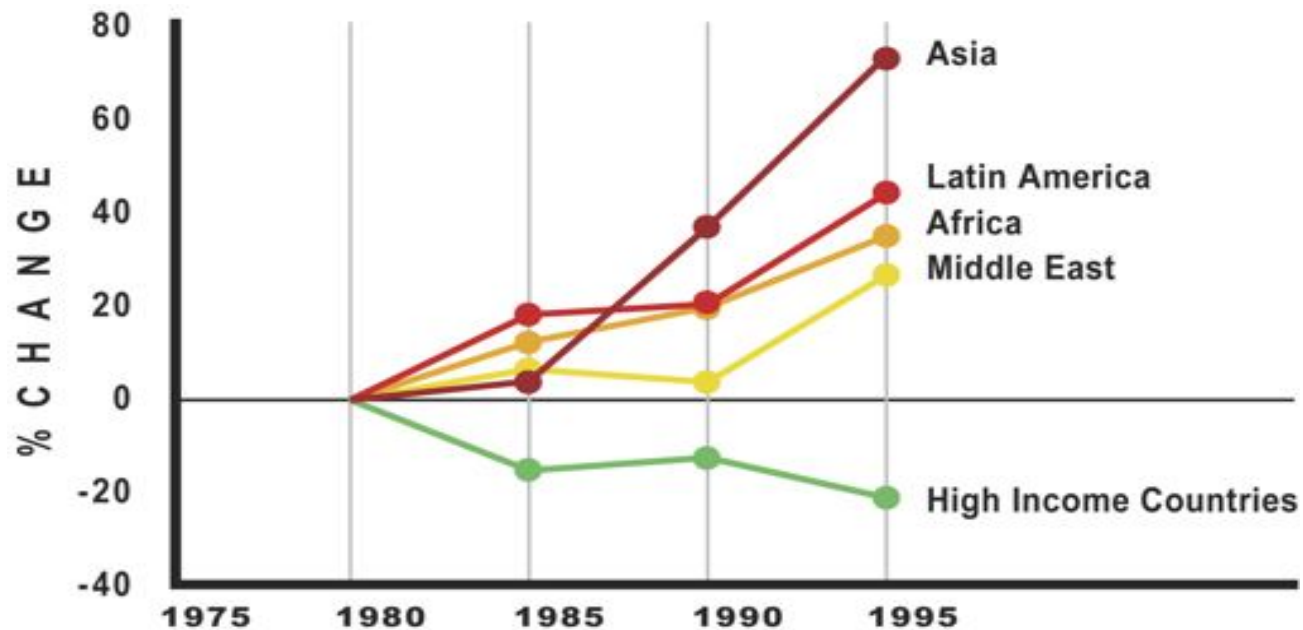
- **The Public Health Burden of Road Trauma**
 - The role of Road Policing
- **The Nexus between Road Policing and Public Health**
 - Used Car Safety Rating
 - Strategic Speed Enforcement
- **Effectiveness of Road Policing and Public Health**
 - Case Study: China Seat Belt Intervention
- **Future Success in Road Policing and Public Health?**



Public Health Burden of Road Trauma

Burden of Road Injury

Globally, Road Traffic Injuries kill 1.2 million people per year and seriously injure 20-50 million people. Fatality rates are expected to rise by 87% by 2020.



A Decade of Action for Road Safety 2011-2020

- 3500 people die, globally, each day from road trauma
- May 11, 2011 UN General Assembly declared a Decade of Action for Road Safety 2011-2020
- Purpose: to highlight that road injury is a public health issue that merits concern and attention as a global development priority.

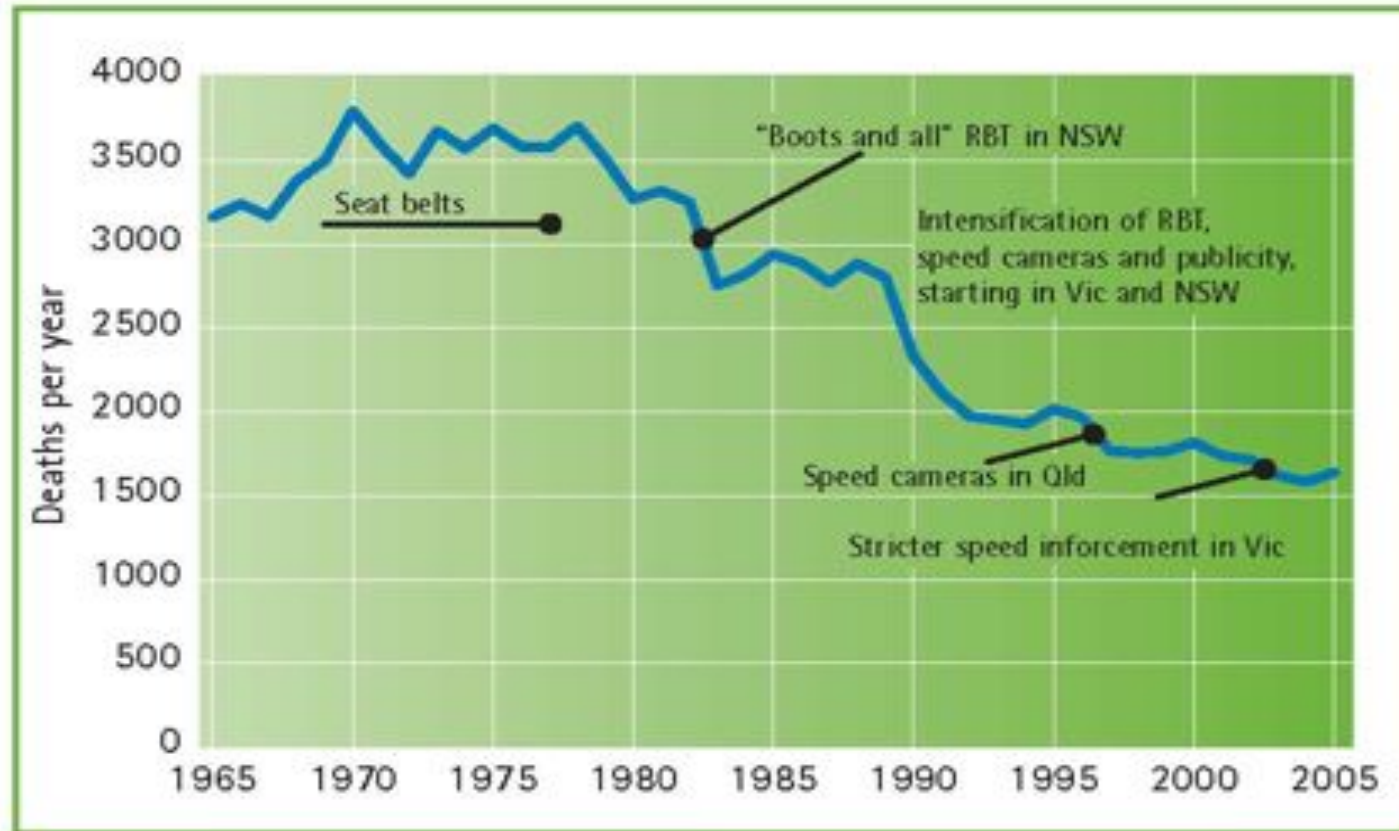


Road Injury as a Global Development Priority?

- From 2000-2030 more cars will be produced than in the first 100 years of motorisation
- Most of these cars will be introduced into LMIC (where vulnerable road user predominates)
- More than 50 million deaths and 500 million serious RTI's are projected over the first 50 years of this century.



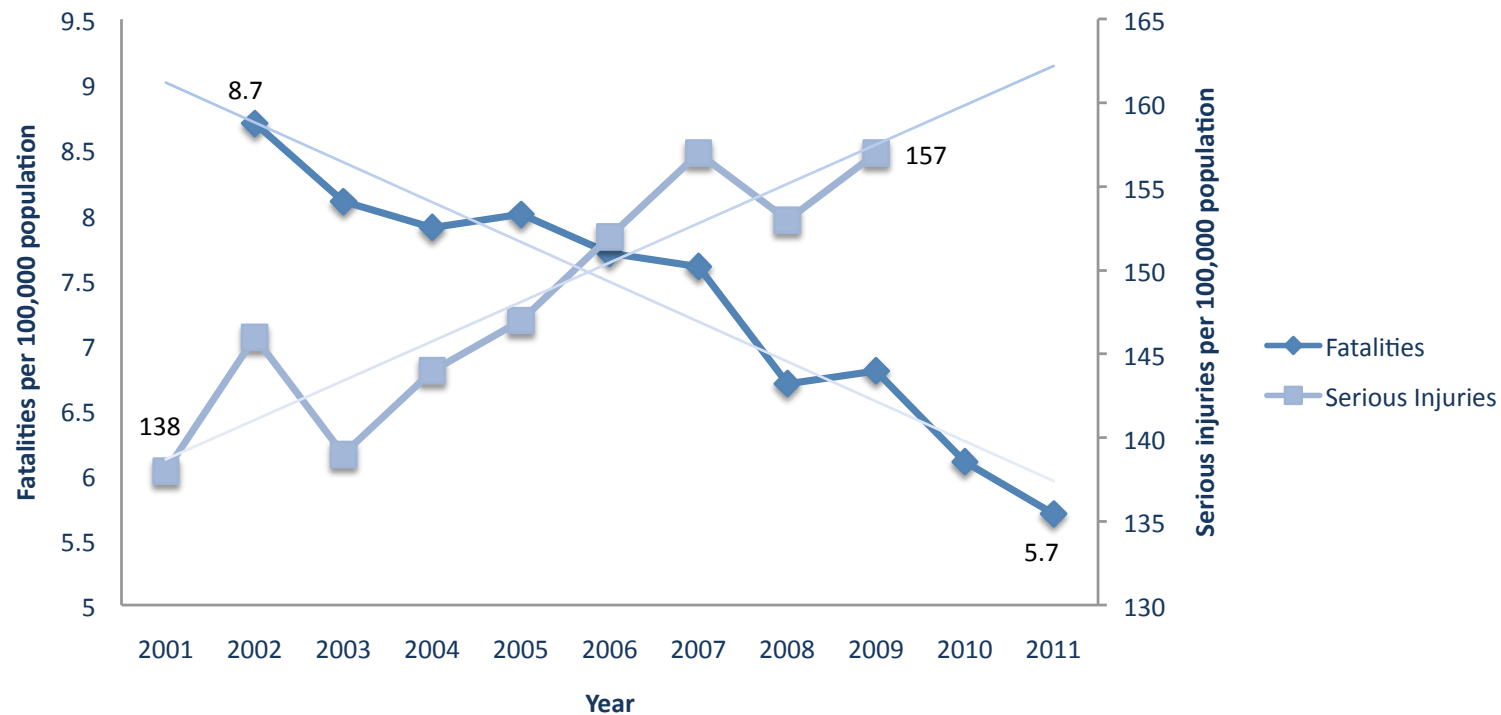
Road Policing and Public Health



Source : Australian Transport Council (2006)

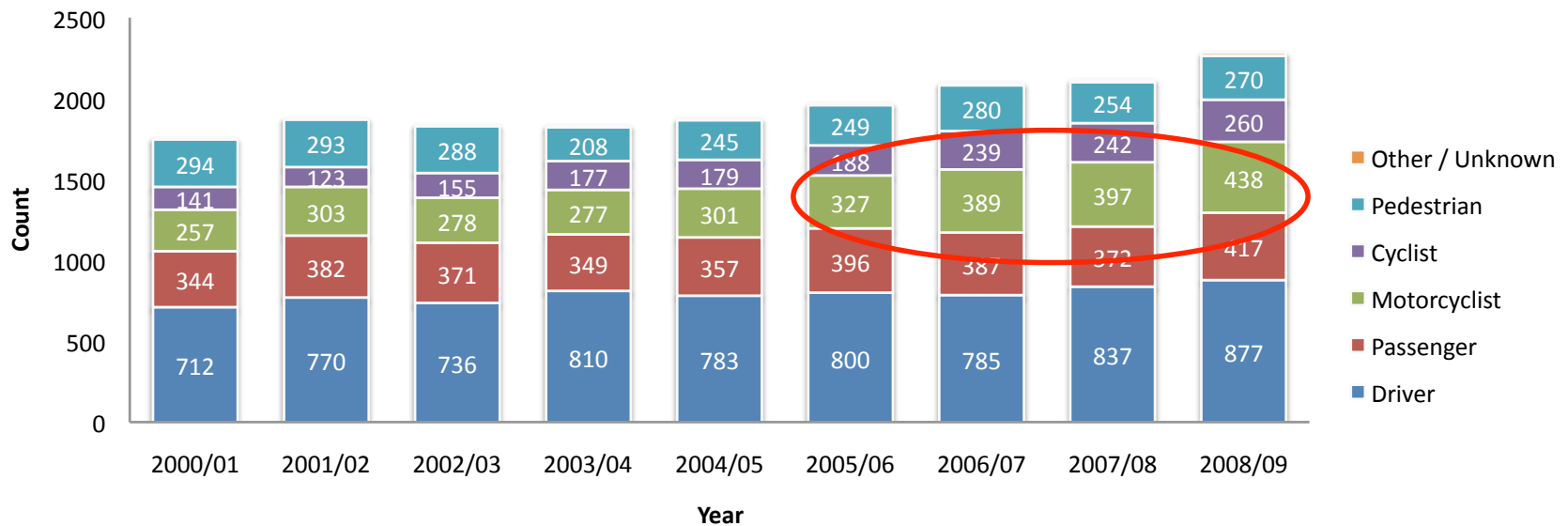
Burden of Road Injury in Australia

Australian Road Fatality & Serious Injury Rates by Year



Public Health Burden of Road Injury

Victorian Serious Injuries by Road User-Type and Year





Nexus Between Road Policing and Public Health

Police Crash Data and Public Health

- For 20 years MUARC have been assessing the relative safety of vehicles in preventing severe injury to the car occupant(s) in a crash
- Crashes reported to police in 6 Australasian jurisdictions
 - Victoria 1987-2008
 - New Zealand 1991-2008
 - New South Wales 1987-2008
 - Queensland 1991-2008
 - Western Australia 1991-2008
 - South Australia 1995-2008
- Total Data
 - Over 5.6 million crash involved people
 - Over 1 million injured people

Vehicle Safety Information for Consumers

The screenshot shows the homepage of howsafeisyourcar.com.au. The site features a navigation menu at the top with links for Home, About, News, FAQs, Contact Us, Safety Features, Driving Safety, Ratings Process, and Search. The main content area includes a search bar with dropdown menus for 'Make' and 'Model', and a 'Search' button. Below the search bar, there are three buttons: 'Find my car', 'Browse cars', and 'Comparison list'. A section titled 'Find safest car by category' displays icons for various vehicle types: light, small, medium, large, compact suv, medium suv, large suv, vans, utility, and people mover. The page also features a 'Safety Features' section with a list of features: Electronic Stability Control (ESC), Curtain Airbags, Anti Lock Braking System (ABS), Brake Assist, Traction Control, and Intelligent Speed Assist (ISA). A featured article titled 'Electronic Stability Control' explains that ESC helps drivers avoid crashes by reducing the danger of skidding or losing control. A 'News & Events' section includes a photo of a Holden Colorado and a headline: 'Holden D Max and Holden Colorado variants fall short'. At the bottom, a 'New Car Safety Reports' section displays five car models with their respective crash test results: SUBARU XV 2012, BMW 3 Series 2012, HONDA Civic 2012, Mahindra XUV500, and MAZDA CX-5 2012. A yellow crash test dummy head is visible on the right side of the page.

GENUINE 5 ADULT SEATS

UNIQUE REAR LAP/SASH BELT

PRE-TENSIONER SEAT BELTS

BUILT-IN REAR CHILD SEAT

METALLIC PAINT

SIPS SIDE IMPACT PROTECTION SYSTEM

CENTRAL LOCKING

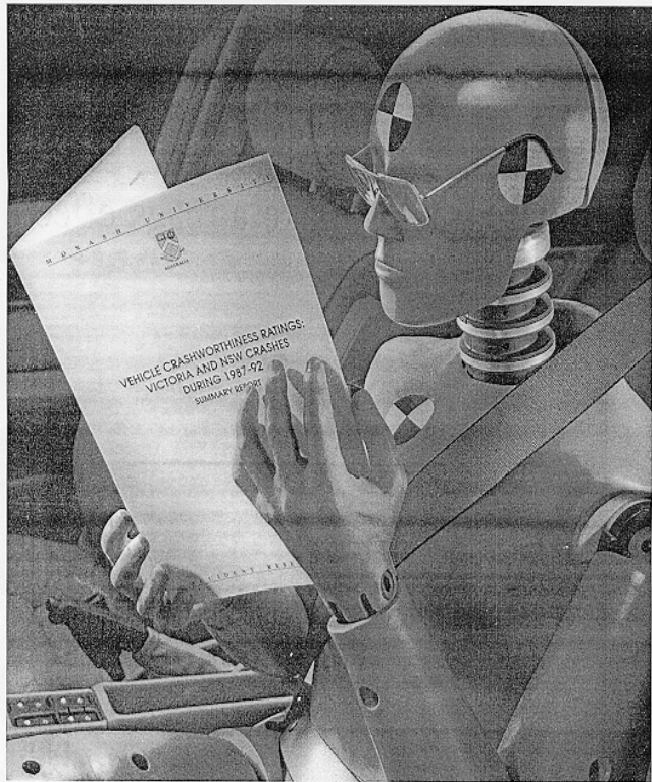
STOP PRESS
THIS LIMITED OFFER APPLIES TO CURRENT DEALER STOCK ONLY

Right now, your Volvo dealer can show you the Volvo 940GL Sedan, with all these features, for absolutely no extra.

What's more, Volvo has recently topped an independent study on safety by Monash University.

VOLVO DEALERS
VICTORIA

**IF IT CAME TO THE CRUNCH,
WHICH WOULD YOU CHOOSE?**



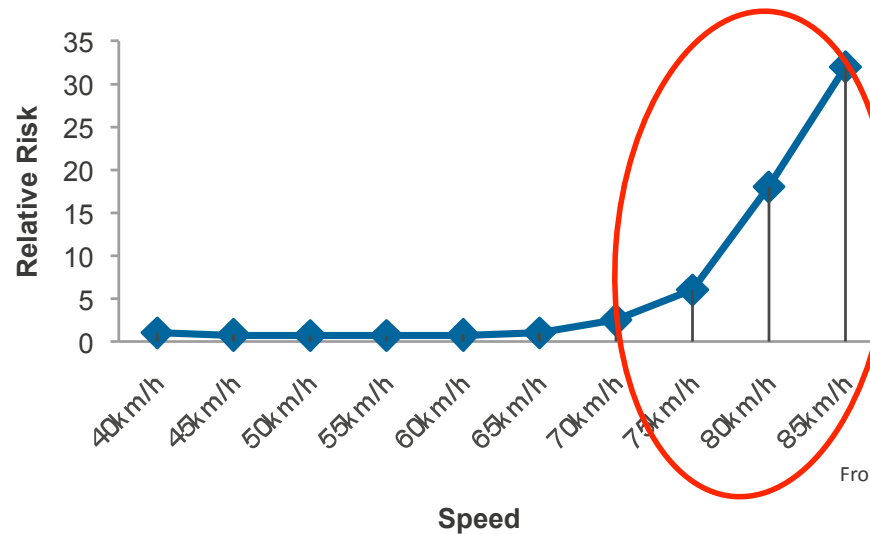
A BMW 5-SERIES.

Road Trauma and Vehicle Speed

Injuries per 100 Occupants by Change in Speed (delta V) at Impact		
Delta V (km/h)	Moderate Injury (AIS 2+)	Serious Injury (AIS 3+)
1-16	4.5	1.0
17-32	10.6	2.6
33-48	29.2	11.1
49-64	53.4	27.9
65-80	67.2	40.6
81+	69.3	54.3

From: Bowie and Waltz, 1994

As Delta V increases injury risk increases



From: Kloeden et al, 1997

Risk of being involved in an injury crash increases exponentially

Gains in Road Trauma Reduction: Police Enforcement

Type of Enforcement	% Change in Fatalities	% Change in Serious Injuries
Speed Enforcement* (mobile patrols)	-14	- 6
Speed Cameras	(-17)	-17
Red Light Cameras	-45	- 12

• Includes stationary and mobile patrols

(Taken from Elvik, 2001)



Effectiveness between Road Policing and Public Health

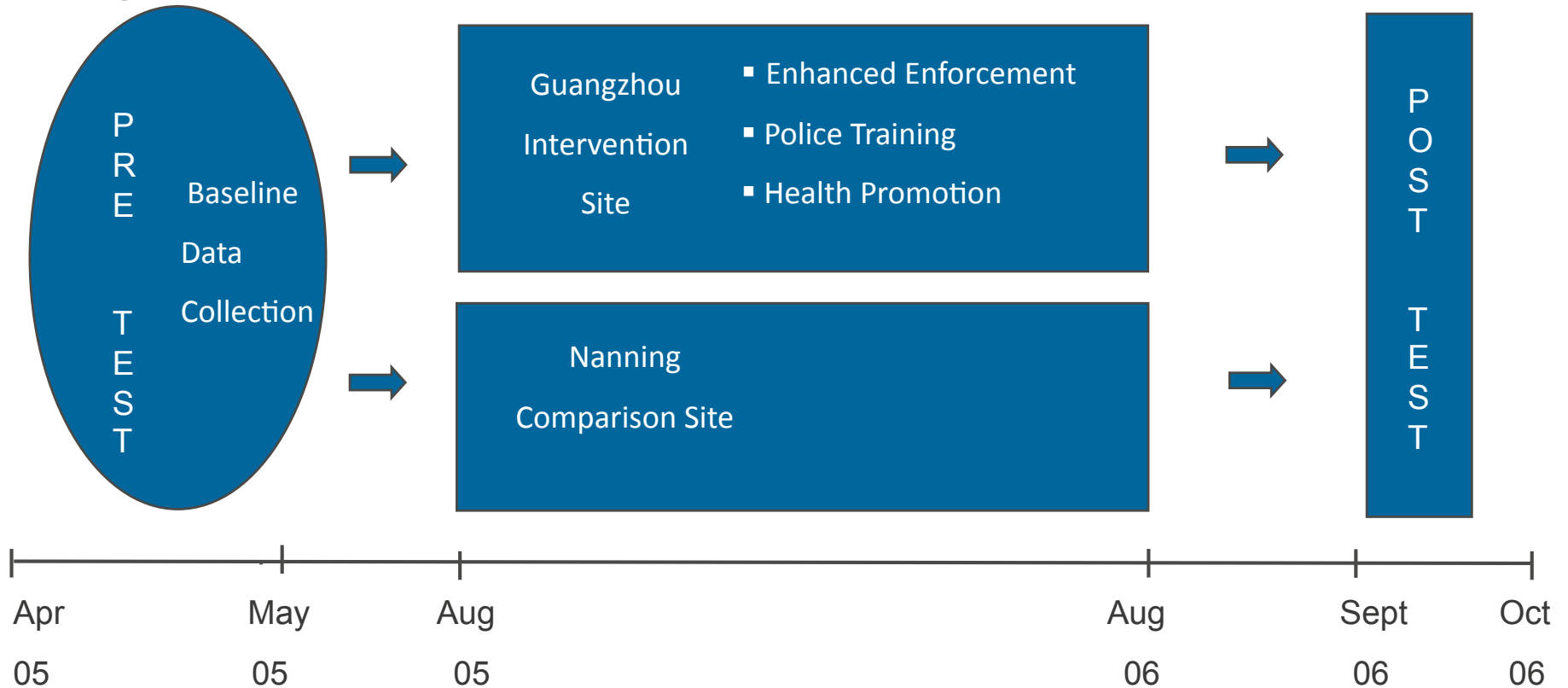
Case Study: China Seat Belt Intervention

Project Aims

- To implement an intervention targeting seat belt restraint use
- To increase seat belt restraint use by 20%
- To estimate the cost effectiveness of the intervention

Project Design

Figure 1: Model for the Evaluation



Project Methods: Intervention

- Enhanced Enforcement
 - Introduction of demerit point system
 - Targets for issuance of fines
 - Audits
 - Supported by media campaigns



Project Methods: Intervention

- Police Training
 - o Ongoing enforcement training by police trainers



Project Methods: Intervention

- Health Promotion
 - Social Marketing
 - TV and radio programs
 - Billboards, road signage and posters
 - Newspapers and internet websites



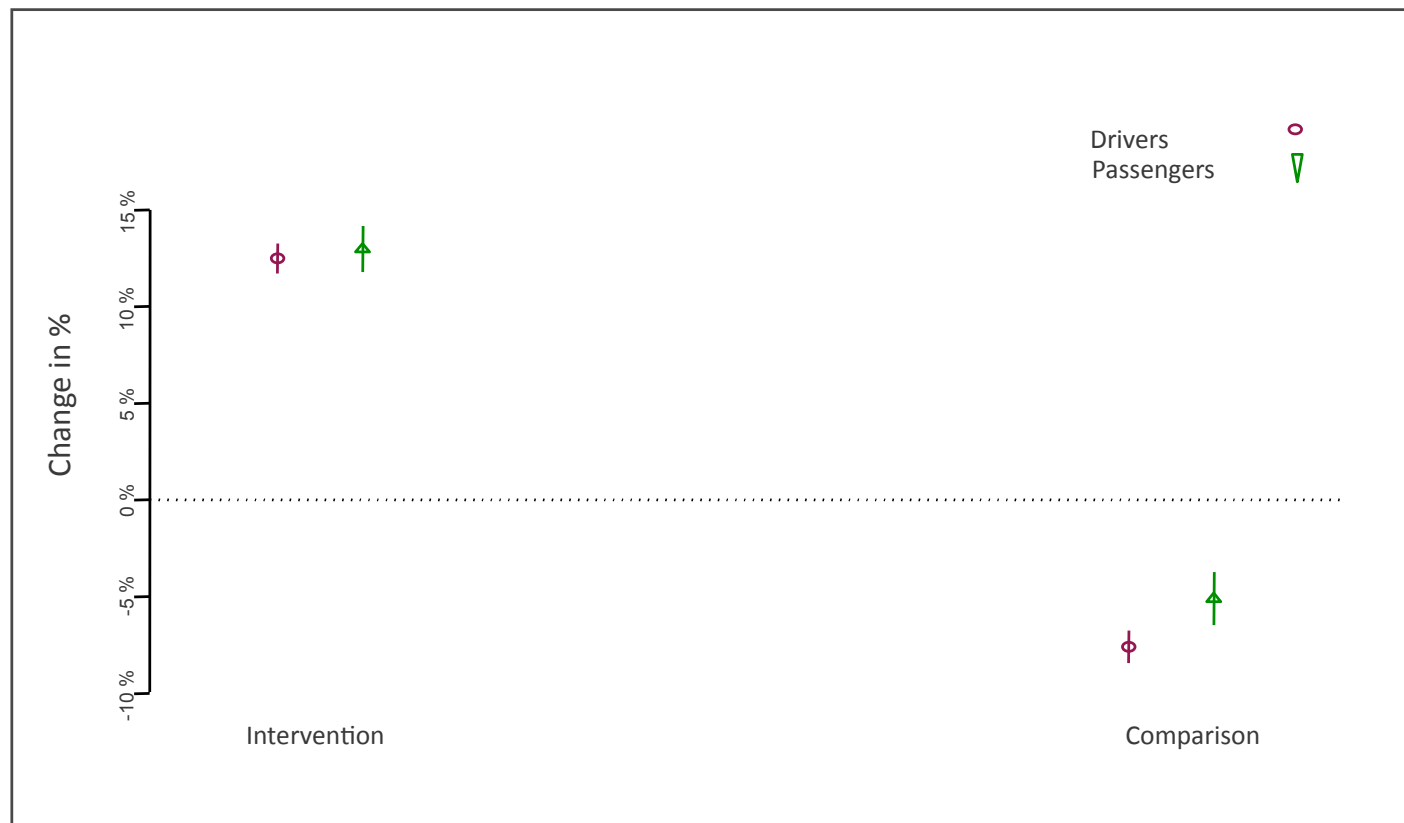
Project Methods: Intervention

- Health Promotion
 - Health Education
 - Taxi company managers
 - Driver training teachers
 - Primary Schools



Project Results

Overall Change in Prevalence Rates for Car Occupants



Project Results

Incremental Cost-Effectiveness Ratio (ICER) - 'the base case' and 'the most likely' - case scenarios

The 'base case'	
Total number of DALYs saved from the intervention	530
ICER: net cost per DALY saved	CNY3,246
	US\$418
The 'most likely case'	
Total number of DALYs saved from the Intervention	617
ICER: net cost per DALY saved	CNY1,329
	US\$171

Project Results

Comparison of DALYs across a Range of Road Safety and Health Interventions

Road Safety Interventions in LMICs

Traffic Calming – Speed Bumps	US\$ 5
Bicycle Helmet Legislation (China)	US\$ 107
China Seat Belt Intervention	US\$ 418
Motorcycle Helmet Legislation (Thailand)	US\$ 467

Other Health Interventions

Coronary Heart Disease – Reducing salt via legislation & education campaign	US\$1,325
Stroke – Acute management with heparin within 48 hours of onset	US\$1,630



Future Success in Road Policing and Public Health?

Current Transport and Road Safety Challenges

- Population Demographics
- Traffic and Air Quality
- Deteriorating Infrastructure
- Reduced Revenues
- Congestion and Productivity
- Road Safety Gains??



Smarter Transportation

Smarter Transportation: Intelligent Transport Systems

Opportunities for road safety gains by 2020?

ITS Technology	Estimated annual crash reductions in Australia ¹
Forward collision warning	16%
Alcohol interlocks	15%
Fatigue management systems	10%

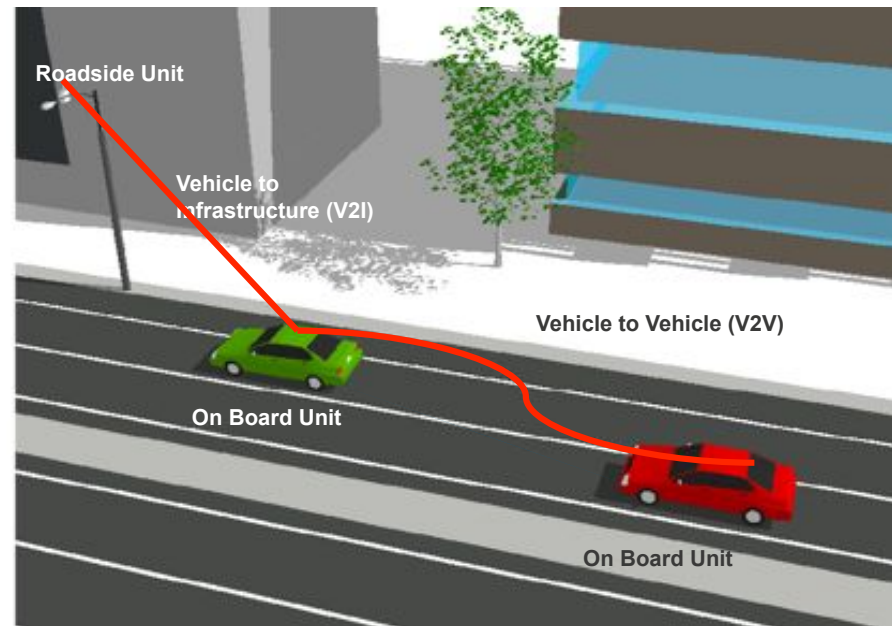
¹ Anderson R et al, CASR Report 094, April 2011

Smarter Transportation = Connectivity



Placing Technology at the Forefront of Road Safety Innovation

- Cooperative ITS
 - Wireless communication
 - Between vehicles (V2V)
 - Between vehicles and the road infrastructure (V2I)
 - Established DSRC Band
 - 5.9 GHz band

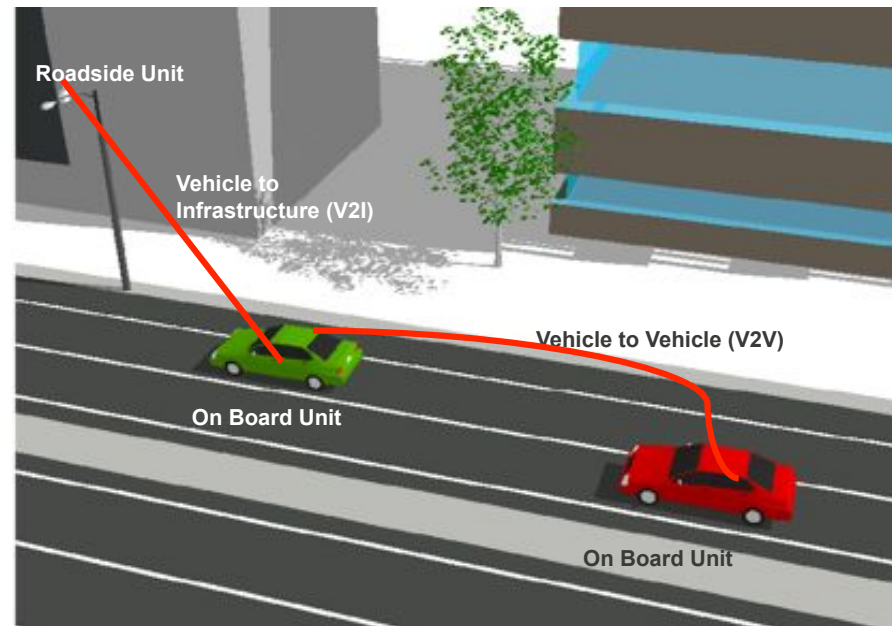


Source: Paul Gray, Beyond 2012 Conference, Melbourne, April 2012.

Placing Technology at the Forefront of Road Safety Innovation

What are the estimated benefits from Cooperative ITS?

- US Department of Transport Estimate
 - Between vehicles (V2V) can address 79% of crashes
 - Between vehicles and the road infrastructure (V2I) can address 26% of crashes
- Measureable road safety gains achieved with only 5%-10% of cars using cooperative ITS





Summary

Summary

- **Road Injury – A Significant Public Health Burden**
- **Success in Road Policing and Public Health**
 - Use of data sources
 - Behaviour change
 - Rapid up-take
- **Future Challenges**
 - Public Health/Road Policing and the Transport System
 - ITS Solutions?

Thank You

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