



Australian Government

Department of Infrastructure and Regional Development

Bureau of Infrastructure, Transport and Regional Economics

Road Safety Workshop

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Parliament House

Road Safety Policy

Every life lost on our roads is a tragedy

Road accidents and deaths are also an avoidable economic cost: estimated at \$27 billion per annum

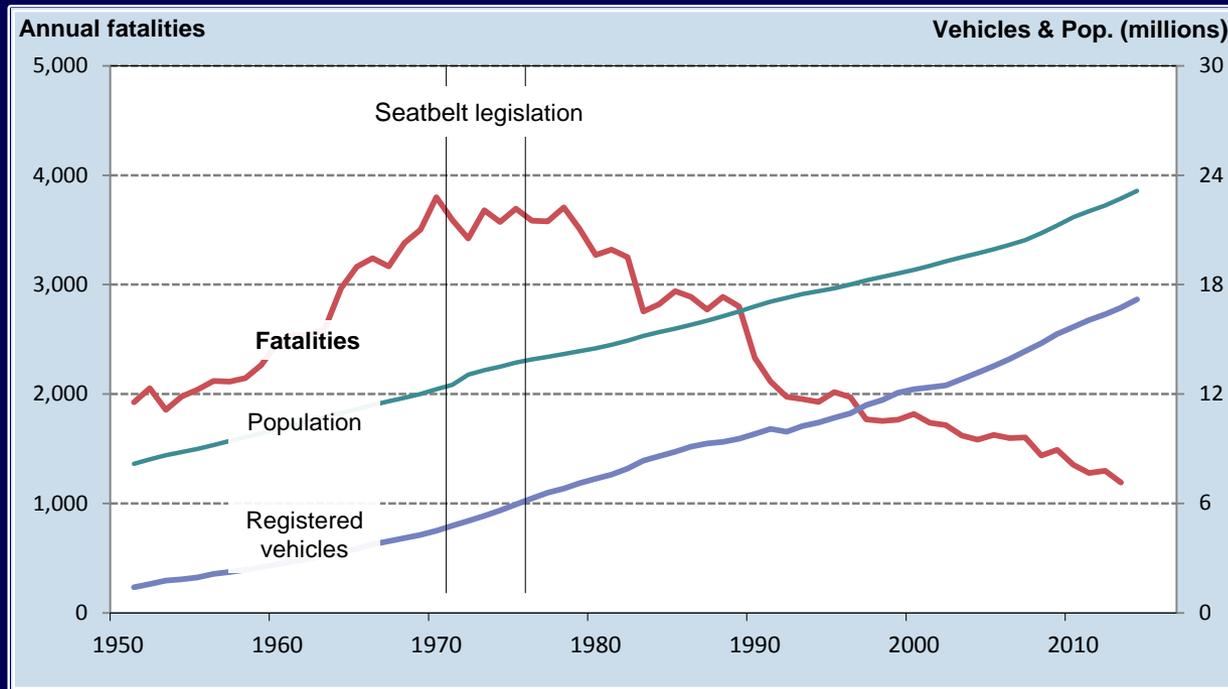
Election commitment:

BITRE will undertake a review to evaluate the benefits and costs associated with different road safety approaches adopted by jurisdictions

Objective:

Estimate the benefits and costs of measures and provide a ranking of measures in terms of reduced trauma and net benefit cost

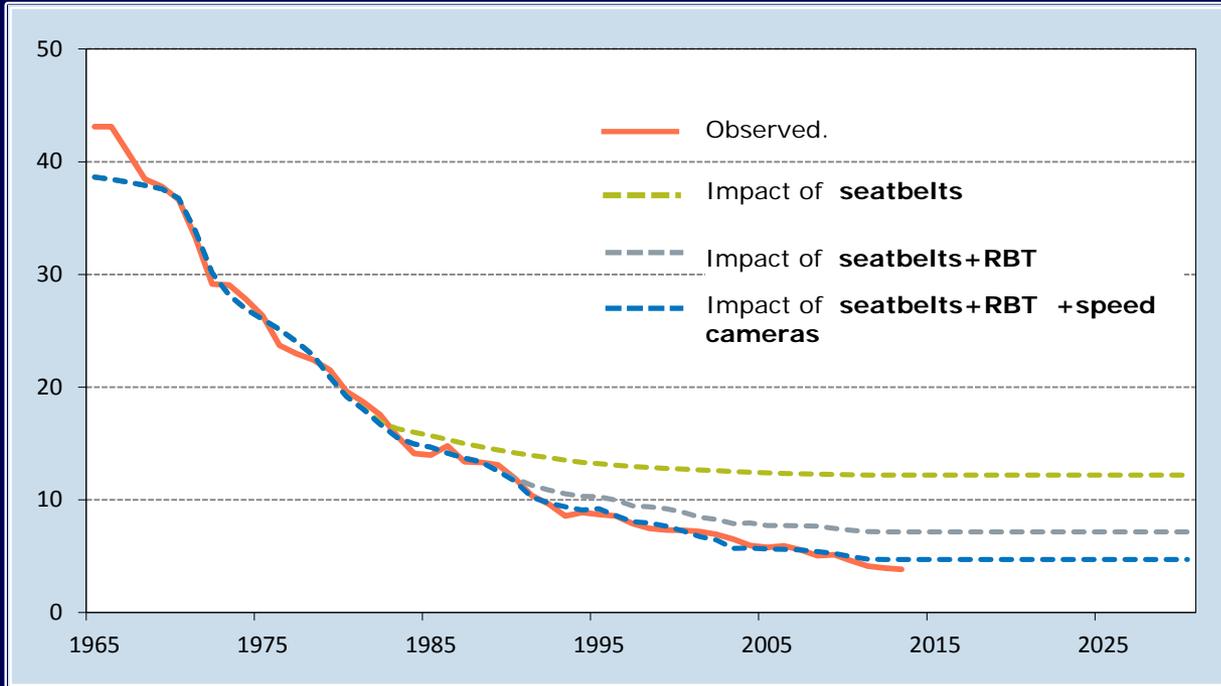
Historical Australian data



Since 1975:

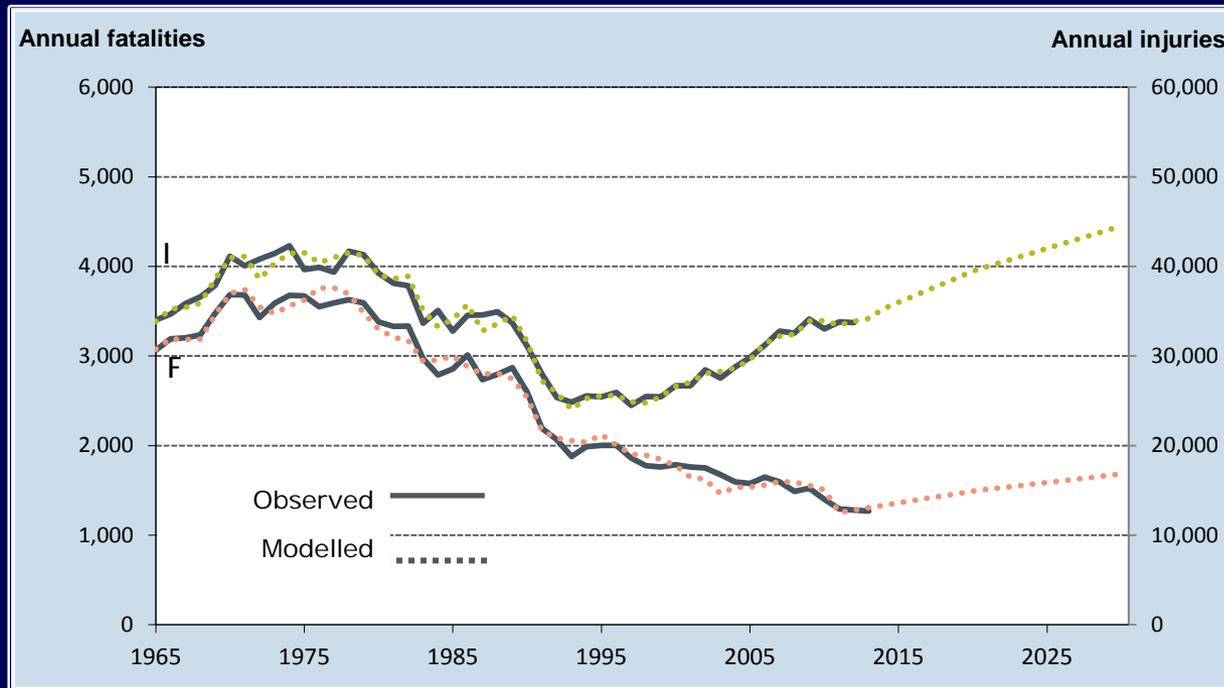
- Population up 70% (+1.4% per year)
- Vehicle registrations up 170% (+2.7% per year)
- Road crash deaths down 70% (-2.9% per year)
- Deaths per 100,000 population down from 26.6 to 5.0 (-4.2% per year)

Fatality



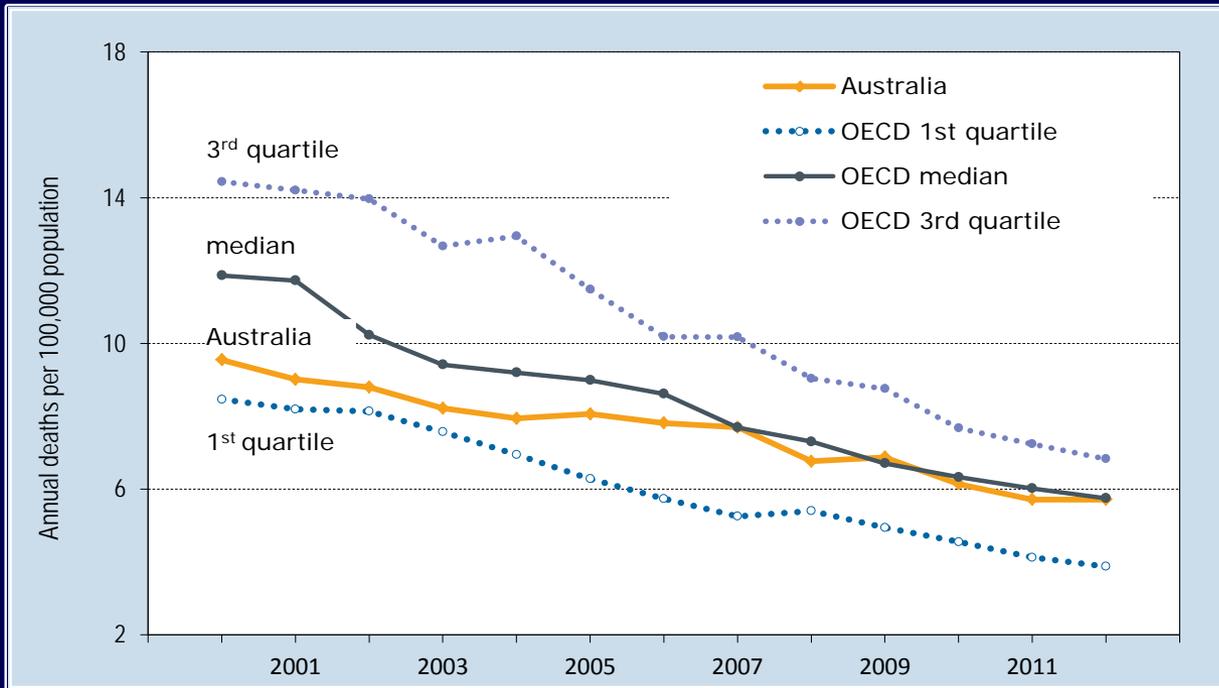
- Seat-belt use reached saturation levels in the 1990s
- Improvements since then have related to blood alcohol testing and speed enforcement

Fatalities and injuries



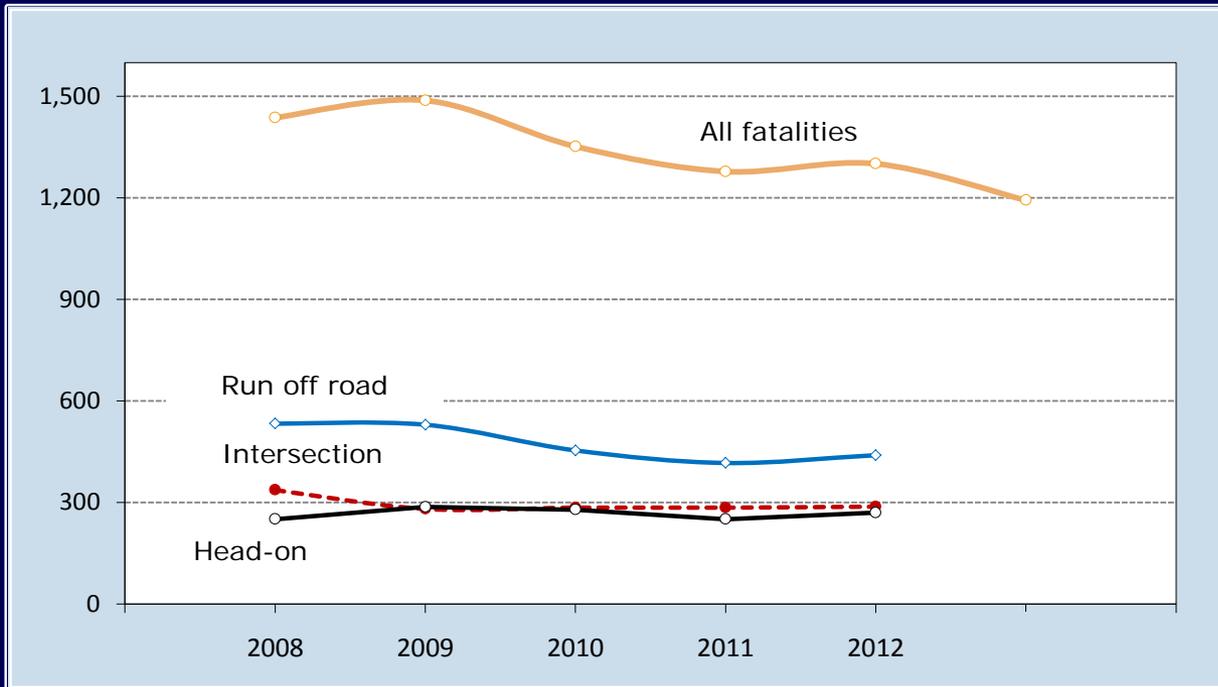
- Forecast increases are based on growth in registrations, population and VKT
- Forecasts assume no major change in roads, vehicles or driver behaviour (excludes electronic stability control)

OECD rates since 2000



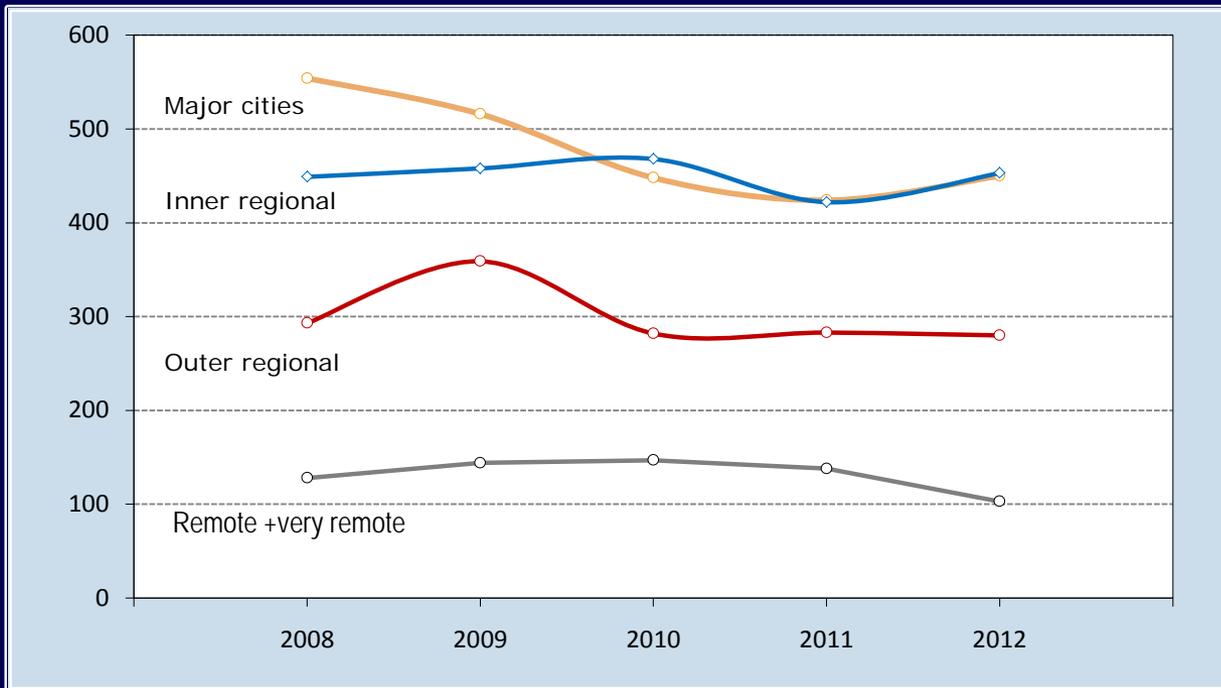
- Australia's rate and the OECD's median rate have been very similar for several years
- Australia has been outside the best quarter of OECD countries for the last decade

Types and location of fatal crashes



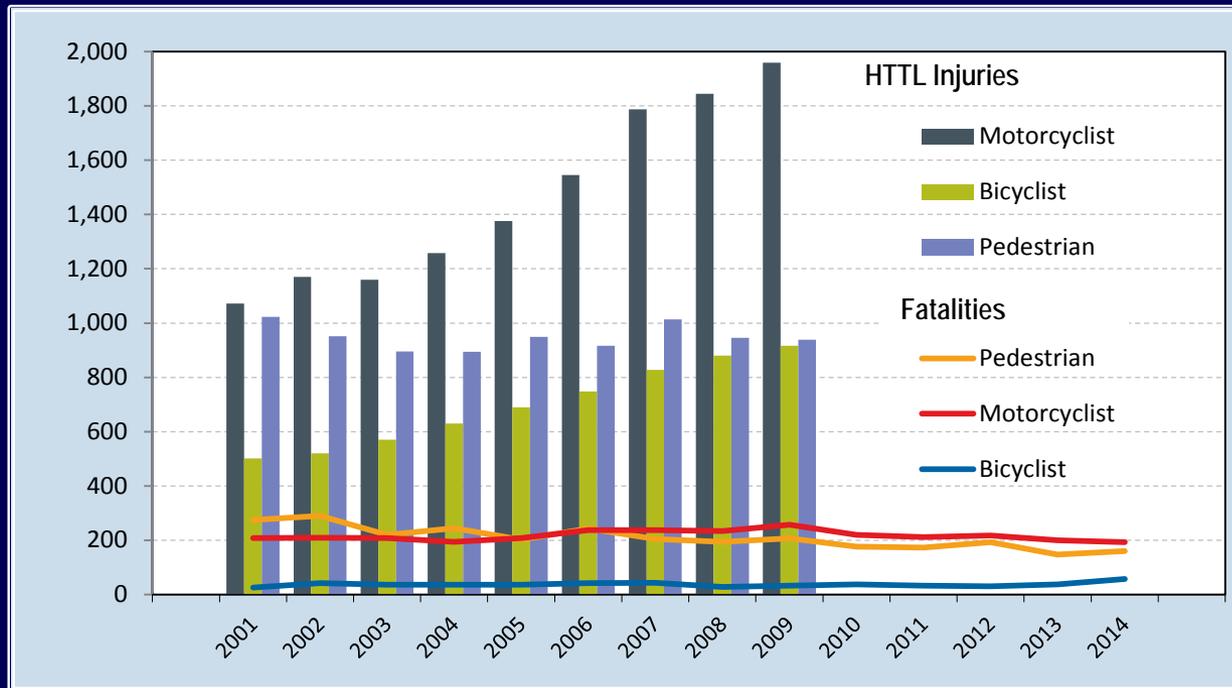
- Run off road crashes most common (37 per cent)
- Intersection and head-on crashes 20 per cent, barely declining
- Older drivers over-represented in intersection and head-on

Types and location of fatal crashes



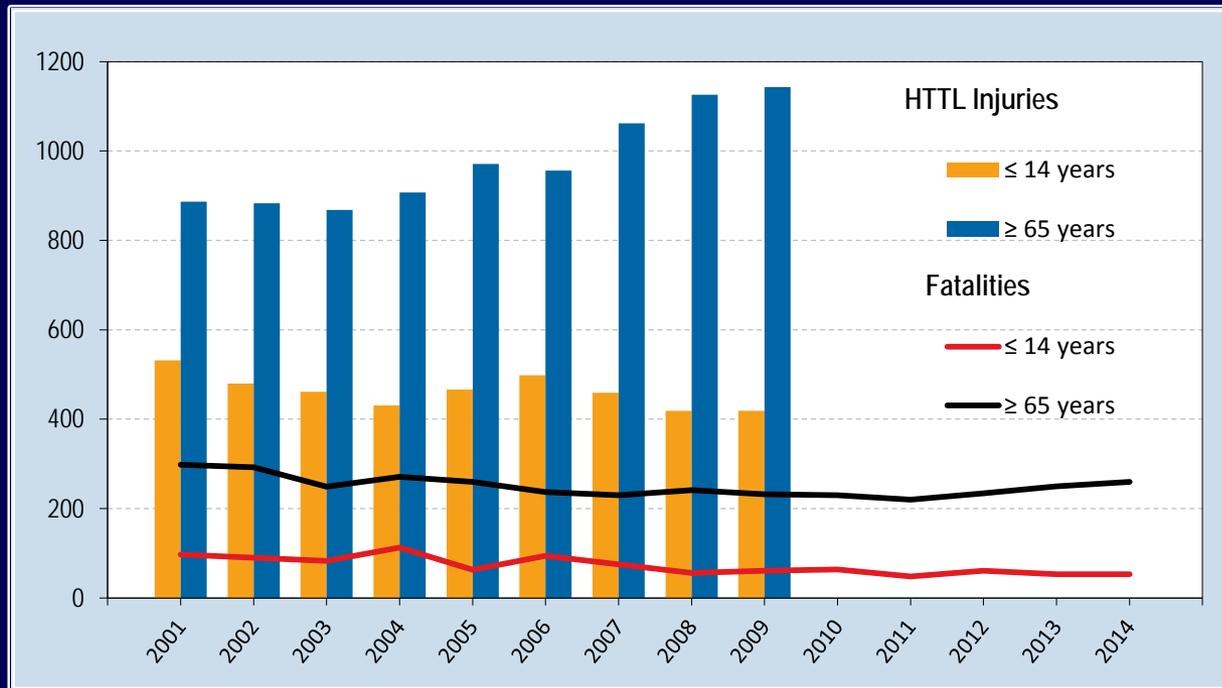
- Largest improvements in cities and outer regional

Fatality and high threat to life trends



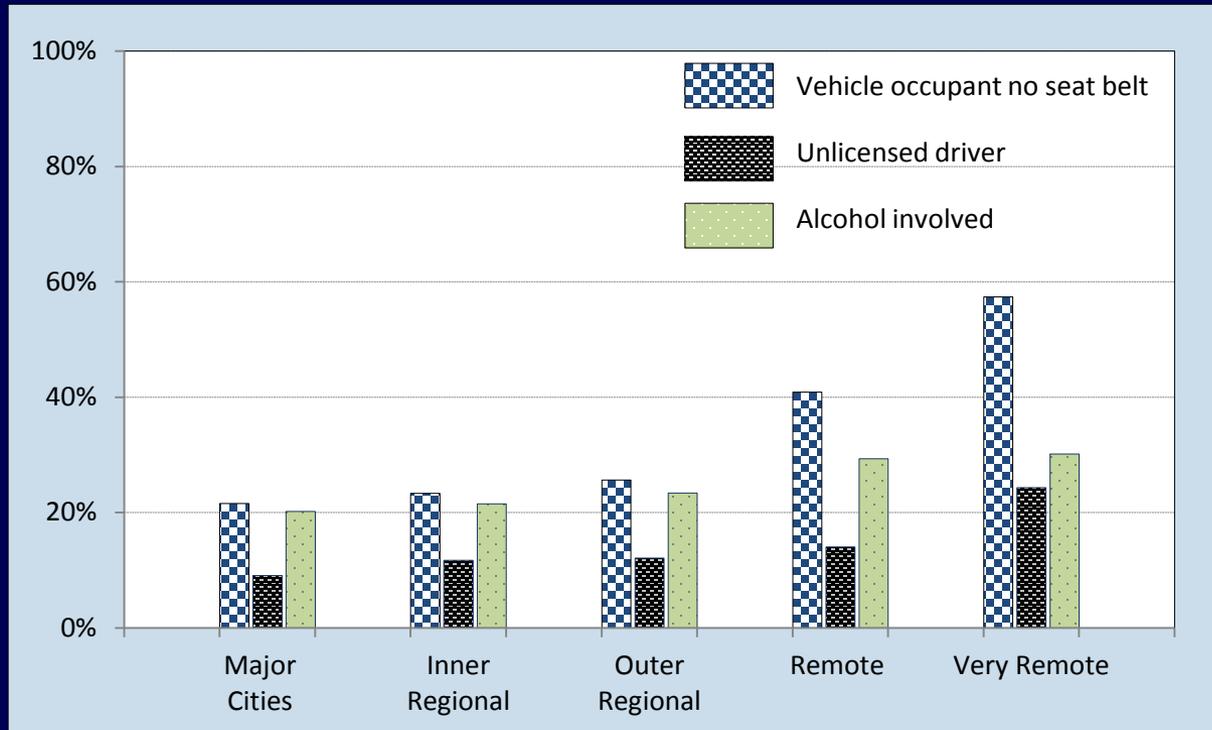
- High threat to life injuries increasing for motorcyclists, pedal cyclists
- Recent increases in pedal cyclist fatalities

Fatality and high threat to life trends



- Improvement for children
- Increased injuries and fatalities for older drivers

Contributory factors: remoteness



— Riskier behaviour in remote areas

What we've found

Priorities by experts:

1. Infrastructure measures
2. Intersections
3. Distraction from mobile phones
4. Autonomous emergency braking

As well as leadership, research, management capacity

Infrastructure

AAA proposal for national land transport network (NLTN)

- 5 stars over 15 years, 4 star minimum for new roads
- 85 per cent of the NTLN to 3 stars
- Roadside barriers, central medians and rumble strips
-  36,000 fatalities over 20 years, BCR 3.49 (AAA)

Evidence that key measures reduce road trauma, but benefits depend on future assumptions

- Traffic growth higher than BITRE estimates
- AAA implicitly assumes total fatalities and injuries unchanged over 20 years if no 'stars for roads' related infrastructure upgrades

Infrastructure

Measure: Improving 85 per cent of NLTN to 3 stars or above

Trauma:  36,000 serious injuries and fatalities over 20 years (AAA)

Cost: roadside barriers \$270,000 / km; central median barriers \$390,000 / km
shoulder rumble strips of \$160,000 / km

Benefits: roadside barriers BCR 3.75; central median barriers BCR 4.95;
shoulder rumble strips BCR 2.48 (AAA)

Issues:

- Trauma reduction estimates appear based on international studies
- Barriers can be negative for some road users

Finding:

- Infrastructure measures can reduce road trauma
- Ausroads model (ANRAM) with Australian parameters and actual traffic levels expected to give the best safety/benefit-cost outcomes

Infrastructure

Measure: Reducing speed limits

Trauma: Speeding is a contributory factor in an estimated 34% of deaths and 13% of injuries (NRSS 2010-2020, Table 4)

Cost: Increased travel times

Benefits:

- For a hypothetical rural highway with high crash risk per vehicle kilometre, the safety benefits of a reduction in speed limit from 100 to 90 km/hr may outweigh the costs of the extra travel time (BCR 1.8)

Issues:

- Reduction in actual speed likely lower than reduction in posted speed
- As vehicles safety improves, the benefits are reduced

Finding:

- Potential benefit of reducing limits pending infrastructure investment

Intersections

22 per cent of fatal crashes are at intersections

- In major urban areas, 40% of fatal crashes are at intersections

Potential measures include

- More roundabouts, particularly at unsignalised intersections
- Eliminating filter right turns – replacing with fully signalised or banning
- Variable speed limits at rural intersections – activated by vehicles approaching intersection
- Channelised right turns

Intersections

Measure: Roundabouts

Trauma: 'roundabouts are generally the most effective treatment, reducing casualty crashes by over 70%' (BITRE 2012)

Benefits: BCR of 11.3 in the Black Spot program for a 4 per cent discount rate (HC safety benefits, before traffic impacts)

Issues:

- Not appropriate in all cases
- Can have significant traffic flow impacts, reducing BCRs
- Negative impact on vulnerable road users

Finding:

- Very effective provided traffic impacts and potential impacts on vulnerable road users are considered

Intersections

Measure: Eliminate filter turns–ban right turns or fully signalise

Trauma: 40 fatalities/year from crashes that may be right filter turn

Cost:

- Increased travel time for both measures (filter turns 2-17 seconds)
- Infrastructure costs for full signalisation depend on location

Benefits: 50% reduction in crashes may reduce fatalities by 20/year

Issues:

- Insufficient data to identify where applies, not appropriate all cases
- Some jurisdictions already implementing

Finding:

- For relevant cases, safety benefits likely outweigh travel time costs

Distraction from mobile phones

Use is increasing, especially younger drivers

- Visual/manual operation of the screen/device is the problem
- Insufficient evidence to show talking associated with a significant increase in events

Difficult to determine contribution to road trauma

- Appears poorly captured in crash data (less than 1 per cent)
- Best estimate is phone use a factor in 7 per cent of crashes
- Human cost of these crashes is approximately \$1.3 billion

Measures

- WHO: best practice is comprehensive strategy

Distraction from mobile phones

Measure: Better enforcement, education, cultural change

Trauma: estimated 91 fatalities / year

Cost:

Benefits:

Issues:

- Prevalence increasing, greater use of fixed or integrated systems
- Already illegal to use a hand held phone in all jurisdictions
- In some states illegal for inexperienced drivers to used fixed phones

Finding:

- Jurisdictions already adopting comprehensive strategies (WHO)
- Further research/trials of innovative detection methods (Vic cameras, WA motorcycle patrols) to demonstrate deterrence and costs

Autonomous emergency braking

Variations: low speed, low speed/pedestrian, high speed

- Most current systems are low speed
- “potential to reduce the impact speed, and hence the severity, in pedestrian crashes, right turn crashes, head on crashes, rear end crashes and hit fixed object crashes”
- Significant potential, varies by type and manufacturer

Focus on passenger vehicle systems

- Included in ‘base case’ passenger fleet projections

Autonomous emergency braking

- Measure: Mandate basic+vulnerable road user by 2018; and
Mandate all speed AEB by 2020
- Trauma: *Without* mandating, AEB expected to save 1400 lives and 62,000 hospitalised injuries by 2033
- Cost: Assumed \$200 basic, \$600 plus VRU, \$1200 full speed
- Benefits: Saves +679 fatalities, +27500 hospitalised injuries by 2033 (2024: 51 lives/yr, 2000 HI/yr) BCR 1.4 / assumed costs
- Issues:
- Lag before AEB equipped light vehicles comprise significant % of fleet
 - By 2030, will self-driving vehicles be available?
- Finding:
- positive BCR with no property damage benefits, assumed unit costs

In Summary

Impressive improvements over last 40 years, BUT

- Road trauma still a huge cost (\$27 billion / year)
- Possible increasing fatalities and hospitalised injuries with population
- Relatively high risk for motorcyclists, pedal cyclists, older drivers and remote communities

Experts identified 4 targets: infrastructure, intersections, phones, AEB

BITRE's initial analysis confirms:

- Value of infrastructure upgrades (specific to road conditions)
- Lower speed limits a valuable option
- Intersection treatments very effective
- AEB will save lives
- Value of a comprehensive mobile phone strategy

Welcome feedback / draft report – end October 2014