**NSW Centre for Road Safety**
Improving road safety: Applying a Safe System

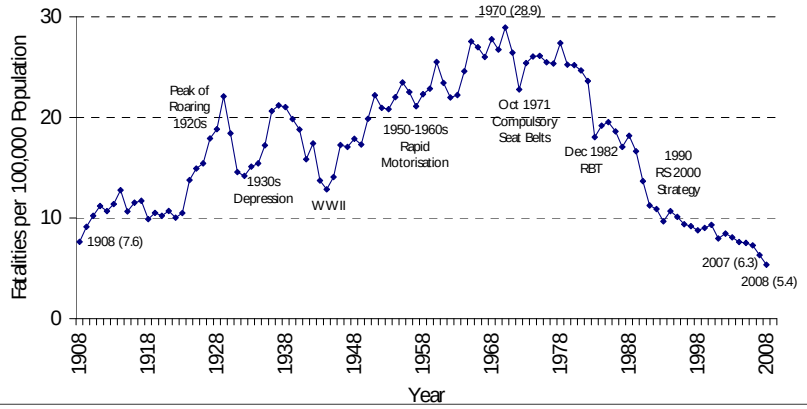
Dr Soames Job
Director
NSW Centre for Road Safety
Roads & Traffic Authority

Dr Soames Job
Director, NSW Centre for Road Safety

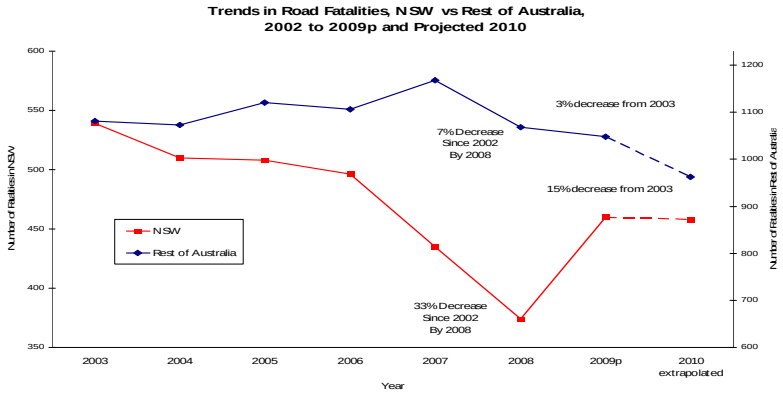
# Historically Low Fatality Rates per Population

- 2008 fatality rate per population (5.4) lowest since 1908
- Fatality rates per vehicle fleet and motor vehicle travel lowest on record

**Road Traffic Crash Fatalities per 100,000 Population, NSW, 1908-2008**

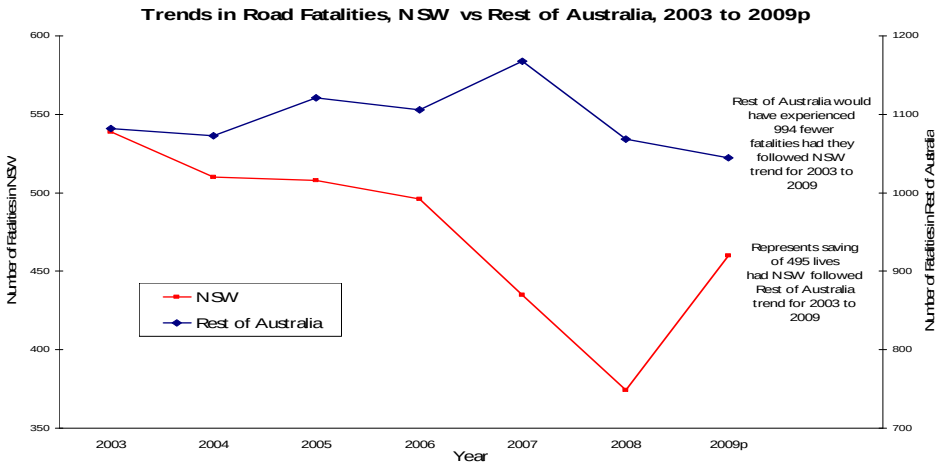


# NSW v Rest of Australia 2002 to 2010 Performances



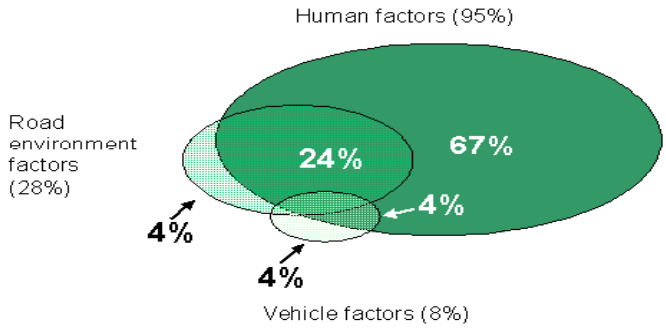

But we can learn from many states, Victoria led earlier and part of this period. South Australia is also doing very well. Qld is doing well this year.

# IT REALLY MAKES A DIFFERENCE



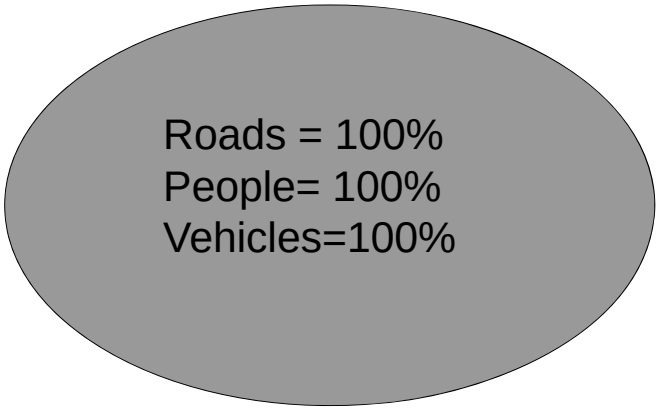
•Compare our current transport outcomes with any other system run by Government

## Old model: does not reflect an integrated approach



**Scientific reality……causes = essential ingredients**

**Scientific reality……**
**causes = essential ingredients**



## Safe Systems Principles

1. People will make mistakes.
2. Humans have a limited tolerance to violent force.
3. Ultimate responsibility for safe transport rests with the system designers and operators.
4. Systems designers and operators must supply a system which forgives to a level which avoids forces beyond human tolerance.
5. Moral demand: No one should die or suffer serious injury on our roads (We don't hand out such severe penalties even for murder).

## Western Australia Commitment

## A new model is required if we are to continue to drive the road toll down

- Road safety resources are limited
- There are limits to behavioural change programs e.g. drink driving, risk taking etc
- Engineering measures can mitigate human error
- International experience shows systems approach works

Operating a Safe System is not business as usual

## Safe Systems

- Adopted by best practice jurisdictions
- Anticipate and accommodate human error
- Acknowledge limited tolerance to force
- Admit the road toll is unacceptable
- Focus on reducing harm to people
- Forgiving road and roadside
- Safe speeds

Road Safety Engineering is critical to operating a Safe System

**Evidence based approach:**

Sometimes the best solution is not of the same form as the problem:

- Engineering for behaviour change
- Speed limits

Sometimes need to innovate with limited resources:

- Roadside hazards
- Space to recover or deflect the errant vehicle

Prevention or Protection

**Mainstreaming road safety**

- ⇨ Challenge
- ⇨ Apply at all levels
- ⇨ Evidence based
  - ➥ Research
  - ➥ Best Practice
  - ➥ Innovation
  - ➥ Organisational culture
- ⇨ More to be done …..

**Joint Responsibility (Mainstreaming road safety)**

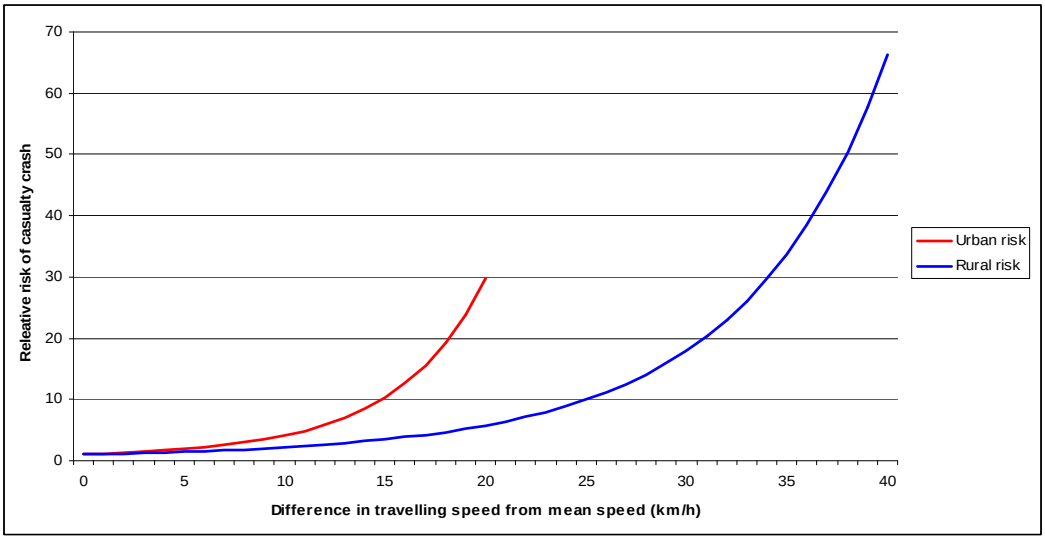
- ⇨ Substantial resources in:
  - ➥ Road construction
  - ➥ Road maintenance
  - ➥ Others areas of business
- ⇨ Senior level support (Executive Road Safety Committee)
- ⇨ Measure road safety outcomes of all work activity
- ⇨ Define Performance Indicators (PI)
  - ➥

**Safe Speed limits (Victoria & South Australia have done well):**

- ⇨ Human tolerances:
  - ➥ 30 km/h pedestrian / vulnerable road users
  - ➥ 50 km/h side collision
  - ➥ 70 km/h frontal collision
- ⇨ Myths associated with speed limits:
  - ➥ Ignored by drivers
  - ➥ Can not be applied to isolated locations
  - ➥ Not suitable for unsealed roads
  - ➥ Must be credible ($85^{th}$ percentile speed)

**Evidence overwhelming demonstrates: Reducing the speed limit delivers real road safety benefits**

# Estimates of risk associated with speeding – Kloeden et al.




# How big is the low level speeding problem?

## Proportion of vehicles detected over the speed limit in NSW

Source: **Is a focus on low level speeding justified?** Evan Walker, Claire Murdoch, Andrew Graham, Ralston Fernandez, RF Soames Job

| Speed band (over speed limit) | Speed limit | | | | | | |
|---|---|---|---|---|---|---|---|
| | **50 km/h** | **60 km/h** | **70 km/h** | **80 km/h** | **90 km/h** | **100 km/h** | **110 km/h** |
| **1-10 km/h** | 74.2% | 81.6% | 78.5% | 77.4% | 75.9% | 81.6% | 79.9% |
| **11-20 km/h** | 22.2% | 15.8% | 18.1% | 18.4% | 19.7% | 15.3% | 17.3% |
| **21-30 km/h** | 3.1% | 2.2% | 2.7% | 3.3% | 3.5% | 2.4% | 2.3% |
| **31-45 km/h** | 0.5% | 0.4% | 0.5% | 0.7% | 0.8% | 0.6% | 0.4% |
| **46 km/h +** | 0.1% | 0.1% | 0.1% | 0.1% | 0.2% | 0.1% | 0.1% |

# Low level speed composes 43% of speeding fatalities

## Population risk of speeding by speed limit – Kloeden's risk estimates

| Speed band (over speed limit) | Speed limit | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **50 km/h** | **60 km/h** | **70 km/h** | **80 km/h** | **90 km/h** | **100 km/h** | **110 km/h** | **Total risk (casualty)** | **Total risk (fatal)** |
| **1-10 km/h** | 30% | 38% | 33% | 45% | 43% | 52% | 54% | **38%** | **43%** |
| **11-20 km/h** | 35% | 41% | 40% | 26% | 26% | 23% | 26% | **35%** | **31%** |
| **21-30 km/h** | 27% | 17% | 22% | 14% | 13% | 11% | 10% | **20%** | **17%** |
| **31-45 km/h** | 6% | 3% | 5% | 12% | 12% | 10% | 8% | **6%** | **8%** |
| **46 km/h +** | 1% | 0% | 1% | 4% | 5% | 3% | 3% | **1%** | **2%** |
| **Casualty crashes % (2008)** | 33% | 34% | 9% | 8% | 1% | 11% | 3% | | |
| **Fatal crashes % (2008)** | 19% | 18% | 9% | 14% | 2% | 32% | 6% | | |

# 67%

## Population risk of speeding by speed limit – Power model

| Speed band (over speed limit) | Speed limit | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **50 km/h** | **60 km/h** | **70 km/h** | **80 km/h** | **90 km/h** | **100 km/h** | **110 km/h** | **Total risk (fatal)** |
| **1-10 km/h** | 55% | 68% | 65% | 65% | 64% | 73% | 72% | **67%** |
| **11-20 km/h** | 33% | 24% | 26% | 25% | 26% | 20% | 22% | **25%** |
| **21-30 km/h** | 9% | 6% | 6% | 7% | 7% | 5% | 4% | **6%** |
| **31-45 km/h** | 3% | 2% | 2% | 3% | 3% | 2% | 1% | **2%** |
| **46 km/h +** | 1% | 0% | 1% | 1% | 1% | 0% | 0% | **1%** |
| **Fatal crashes % (2008)** | 19% | 18% | 9% | 14% | 2% | 32% | 6% | |

**Safe Vehicles:**

- ⇨ Performance in event of a crash:
  - ➥ ANCAP rating
- ⇨ Performance in avoiding a crash:
  - ➥ SafeTscore
- ⇨ Fleet purchase policy
- ⇨ Licensing / registration incentives
- ⇨ Risks:
  - ➥ Inexpensive vehicles
  - ➥ Larger and smaller vehicle compatibility
  - ➥ Non-vehicles (gophers, segways etc)

**Safe Speeds:**

- ⇨ NSW, Victoria and Western Australia have done well.
- ⇨ In 2010, Queensland and NSW introduced covert mobile speed cameras

**Safe People:**

- ⇨ Public Education Programs:
  - ➥ Maintain awareness ⇨ Support for programs
  - ➥ Extend effectiveness of enforcement programs
  - ➥ School based programs
- ⇨ Information programs:
  - ➥ Why countermeasures are implemented
  - ➥ How countermeasures work
  - ➥ Impact of countermeasures on road users
  - ➥ Dispel popular myths

**RTA Pinkie Campaign**

## RTA Mobile Speed Camera Campaign

Victoria – biggest committed spend on road safety on roads.

Western Australia – best safe system road.

New South Wales – most innovative retrofit process

## Perth to Bunbury Freeway

## Innovative Median Separation

# Route Reviews – Safer Roads

Focuses road safety effort on high risk locations in a short time frame, rather than treating isolated sites

A strategic approach:

- 'High risk' routes
- Multi-disciplinary
  - –engineering works
  - –behavioural programs
  - –enforcement strategies

The program is developed to supplement planned maintenance treatments and precedes longer term and more costly road upgrades.

Before the installation of the wire rope safety barrier median Pacific Highway

**Completion of the installation of the wire rope safety barrier median Pacific Highway**


## Some typical treatments to problems

- Wire rope barrier separating opposing traffic lanes
- White posts also improve delineation and guidance

**Guardrail Barrier**

**Concrete Barrier**

**Wire Rope Barrier**

## Challenges to operating a Safe System:

- ⇨ Too expensive
- ⇨ Too hard
- ⇨ Willingness
  - ➥ Inevitability (acceptability)
  - ➥Victim Blaming
  - ➥ (Road user) Behavioural problems
  - ➥ Not an engineering problem
  - ➥Primary v's secondary safety; prevention v's cure
- ⇨ Limited jurisdiction
  - ➥ State managed roads
  - ➥ Local government managed roads

- ⇨ More can [must] be done …..