



CRICOS PROVIDER 00123M

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## Addressing risky behaviour and avoiding the aftermath

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Slide 1  
*seek* LIGHT

**1963**



**2021**



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# Boeing 737 Max

From blame the pilots -> Systems Failure



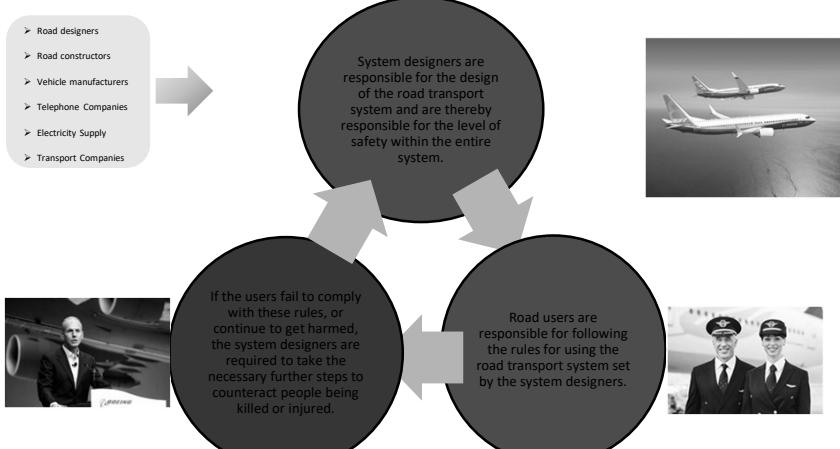
*The pilots did not have sufficient information on system operation and risk*

# Sufficient Information???

- Fatal five behaviours
- ANCAP ratings for passenger cars
- Incremental road upgrades rather than star ratings
- Sparse communication on the inherent danger of the system
  - A side impact into a tree on a 2 star road even in a 5 star car is likely to be fatal
  - Which route should your children take to the holiday house?



# Shared Responsibility



Source: after Johan Strandroth

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Shared responsibility in road safety is an often mis-represented concept. In Sweden, the weight of responsibility lies with the system designers. While road users are expected to comply with the rules for using the system, if the users fail to comply, the system designers must again intervene to prevent further harm from occurring thus completing a proper feedback loop on road design and operation.

## The CASR “Extreme Behaviours” Study

- Assess what proportion of crashes are due to “system failures” or “extreme behaviour”
- Analyse two sets of crashes:
  - Fatal crashes described in SA Coroner’s files, 2008-09 (n=189)
  - Non-fatal crashes investigated in-depth by CASR (n=453)

Wundersitz, L. N., Baldock, M. R. J., & Raftery, S. J. (2014). The relative contribution of system failures and extreme behaviour in South Australian crashes. *Accident Analysis & Prevention*, 73, 163-169.

# Extreme behaviour

- BAC  $\geq 0.15$  g/100ml
- BAC  $\geq 0.10$  g/100ml if provisional licence or motorcyclist
- Speed 50% or more over the speed limit (e.g. 90 in a 60 zone)
- Pedestrians reckless behaviour (e.g. lying on the road) or BAC  $\geq .20$  g/100ml
- Combination of:
  - speed 30% or more over speed limit (e.g. 80 in a 60 zone)
  - positive for prescribed drug (THC, MA, MDMA)
  - BAC  $\geq .10$  g/100ml
  - reckless behaviour (e.g. dangerous overtaking)
  - consideration also given to non use of seatbelts

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Arbitrary line.

Extreme behaviour needed to be deliberate.

Drawn on research literature that has quantified risks associated with extreme behaviour.

BAC - .15 RR 15 times higher than 0 BAC, RR higher for m/cyclist & P plater who need to allocate more cognitive capacity to driving.

Not an offence to be a drunk ped, limited knowledge on effects of alcohol on ped behaviour

Speed – Risk of casualty crash doubles with each 5km/h over speed limit. Travelling 20-25km/h over speed limit similar risk to BAC of .15. Public doesn't appreciate risks. Speed limits vary definition expressed as % over speed limit.

Drugs – impairment by drugs less clear, increase in crash risk but not same extent as alcohol. No legal limits, just detecting presence. Don't know at what level a driver is impaired. Positive is not enough to be extreme.

## Illegal system failure

- Illegal behaviour contributing to crash or injury but not extreme
- Crashes involving exceeding the speed limit, drink driving, non-seatbelt use etc. but not extreme
  - e.g. fully licensed driver with a BAC 0.05 - 0.15

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Criteria for extreme behaviour - very high levels of alcohol and speeding.

Illegal system failures are part of the range of behaviours on the continuum between the two concepts (system failure and extreme behaviour).

Counted separately.

# System failure

- System failure
  - compliant road user who makes an error



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*There is a belief in the community that fatalities are the result of risk taking or extreme behaviour, and these crashes can receive extensive media coverage.*

We wanted to know what proportion of crashes in Australia can be attributed to extreme behaviours and what proportion are due to road users making simple errors within the road system resulting in 'system failures'.

Previous research in this area has concentrated on estimating the contribution of individual driver errors rather than system wide failures.

# Conclusions

- Most crashes - ordinary people making simple mistakes

Category	Fatal	Non-fatal rural	Non-fatal metro
System failure	30.7	74.0	86.8
Illegal system failure	23.8	16.6	9.9
Extreme behaviour	45.5	9.4	3.3

- System failure crashes – daytime, weekdays, rural areas, roads with high speed limits
- Greater extreme behaviour in fatal crashes
- Fatality rate possibly a misleading measure of the safety of the road system

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**Over half of all fatal crashes and over 90% of non-fatal crashes in South Australia involve people making simple road user errors or ‘system failures’.**

Reason for **optimism**. This means that improvements to the road transport system can be expected to be much more effective in reducing crashes than concentrating on preventing extreme behaviours. Such a strategy could reduce the incidence and severity of a large proportion of crashes in SA. Expect a decrease in system failure crashes over time if road safety strategies target compliant road users, resulting in a safer road system.

System failure fatal crashes were more likely than extreme behaviour fatal crashes to occur during the day, on weekdays, in rural areas and on roads with high speed limits.

*\*The characteristics of ‘illegal system failure’ fatal crashes were more similar to ‘system failure’ crashes than ‘extreme behaviour’ crashes. Occurred more frequently in rural areas, during the day, on weekends and on undivided roads with high speed limits. Reinforces that ‘illegal system failure’ crashes can be broadly classified as ‘system failures’.*

The proportion of crashes involving extreme behaviours was higher for fatal crashes, not surprising given that higher levels of extreme behaviours such as alcohol use and speed are associated with an increased likelihood of injury in a crash.

Another important implication of this research is that injury crashes are telling a different story from fatal crashes. This means that we cannot rely only on fatal crash data when formulating road safety strategies. We need to include injury crash analysis as well. Just looking at fatalities makes it look like there is more extreme behaviour than what there really is.

## Various System Analyses

- Swedish SRA Model (after Stigson)
- CASR “Extreme Behaviours” study
- CASR replication of the Swedish model in SA
- MUARC ECIS
- All point to the bulk of the injury burden being associated with “system gaps and failures” rather than extreme or high risk behaviours
- People are set up for failure

# Enforcement

- What matters:
  - Certainty of getting caught
  - Swiftness of punishment
- Australian agencies traffic is 20-25% of function
- Ongoing budget and resource pressures
- Mass media coordinated with enforcement a proven approach
- Increasing role for technology, monitoring and data
  - Strategic approaches to cover the enforcement deficit



## Towards holistic & multifaceted approaches

- Broader social problems and not just road safety
- Management spectrum:
  - Legal and administrative, non-punitive, and technological
- Recidivists for example
  - supervision, therapeutic intervention, and the incorporation of technologies to manage and monitor behaviour
- Resource Sector and some corporates
- Greater role for vehicle manufacturers and technology providers
- Extending the notion of duty of care:
  - Insurance levers
  - WHS levers
  - Behaviour monitoring widgets (parental control)
  - The Social Model (National Strategy)
  - Media portrayal and communications

# Driving Monitors



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<https://www.nytimes.com/2020/11/19/business/teen-driver-monitoring-systems.html>

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## NZTA and employee speeding

- “Tougher rules brought in through the Health and Safety Reform Bill 2016, mean it's no longer just an employee's responsibility to watch their speed – there is now an emphasis of responsibility on the employer too.”
- GPS tracking showed:
  - 357 speeding incidents up to Jun 2019
  - 284 speeding incidents to Dec 2019
  - 2333 in 2018



<https://www.stuff.co.nz/national/118929726/nzta-vehicles-caught-speeding-almost-twice-a-day-gps-figures-show>

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