



System Failures



Blame game



YouTube: Nine News https://www.youtube.com/watch?v=_Pw3w3EqIfk



YouTube: Nine News <https://www.youtube.com/watch?v=fHeQRB1MipY>

Duty of care to innocent bystanders?

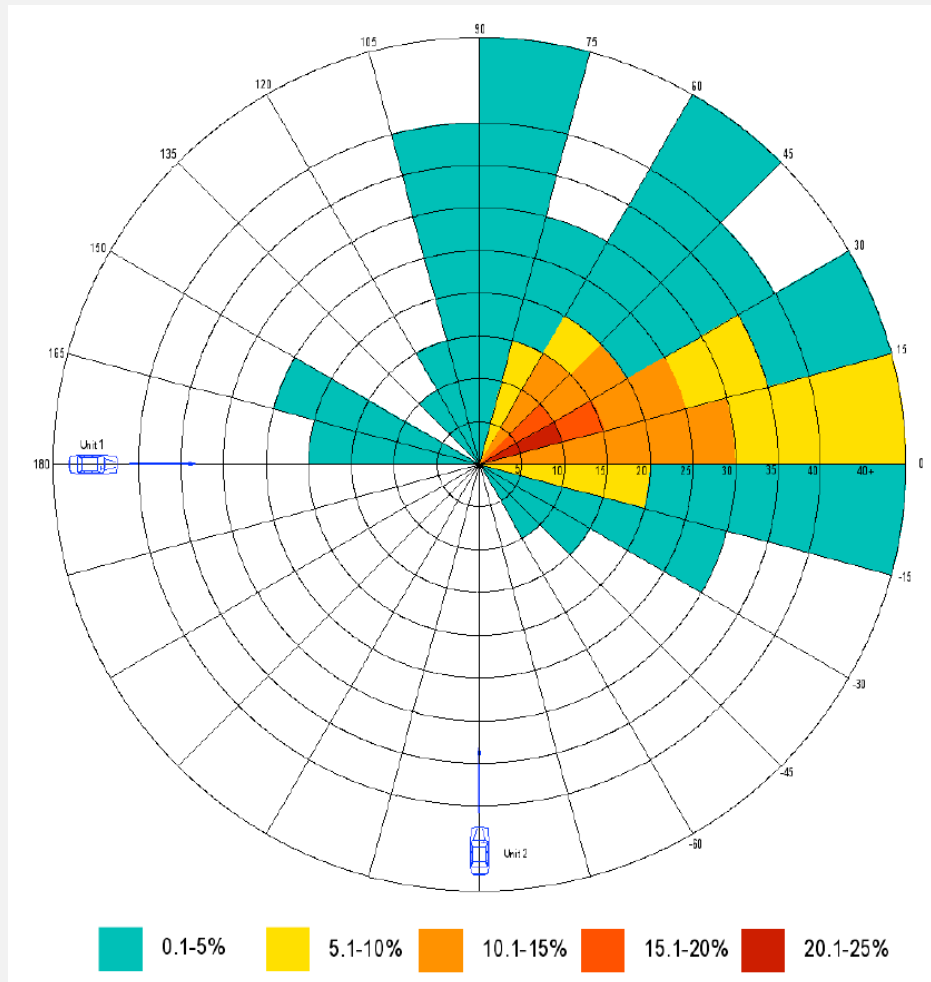


Source: ABC News <http://www.abc.net.au/news/2015-03-25/scene-of-fatal-hatherleigh-sa-crash/6346516>



Youtube: Nine News

Duty of care to innocent bystanders?



Youtube: Nine News

Designed to fail

We place people in circumstances where failure can be expected



Designed to fail

We place people in circumstances where failure can be expected



Designed to fail

We place people in circumstances where failure can be expected

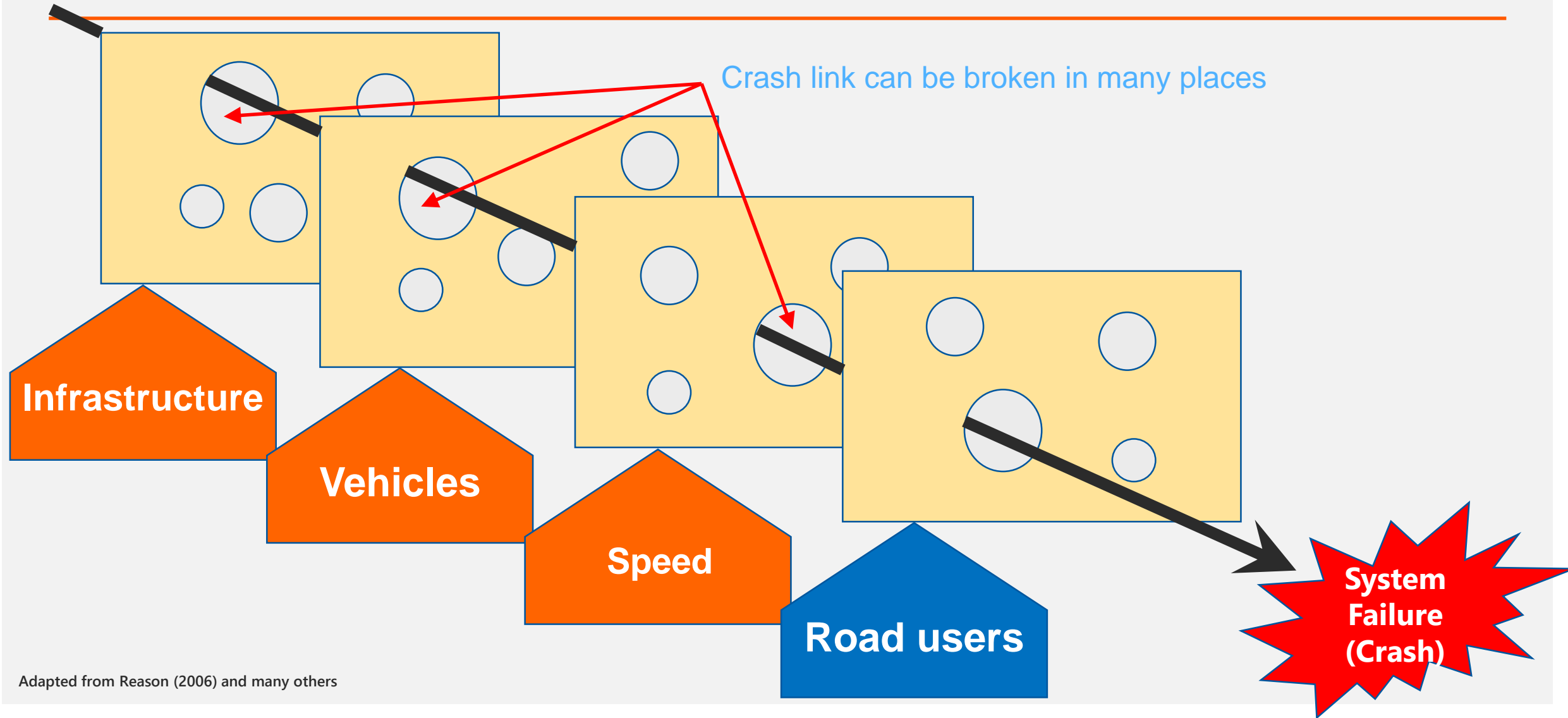


An error of judgement is to be expected in such circumstances

Consequences would be severe



Redundancy is important



Redundancy



Road user errors



System failures, not extreme behaviours

- A common community perception is that the road safety problem is associated with “extreme behaviours” involving speeding, impaired driving and high levels of risk taking
- Media coverage tends to reinforce the idea of extreme behaviour being the root problem
- Wundersitz et al. 2011:
 - 97% of metro (91% rural) non-fatal injury crashes were the result of system failures
 - 54% of fatal crashes were the result of system failures

Road user errors



Helena Stigson Papers, 2008

- Analysis of 215 fatal crashes in Sweden
- Multidisciplinary team causal analysis: roads - speeds – vehicle – road user
 - ~90% could be assigned to vehicle / road / people interactions
 - The road was the pillar most commonly linked to a fatal outcome
 - Changing the road was most likely to lead to prevention of a fatality (Swiss cheese)

Road user errors



Lessons from Austroads (2014)

- Review of safe system treatment models applied to crashes on rural South Australian roads
- Road rule violations accounted for up to 25% of crashes (depending on how they were defined)
- Crash type and immediate cause were not different from those resulting from non-deliberate errors
- Suggestive that treatments to manage non-deliberate errors will also protect against violations

An example of system failure

Austroads (2014) study into user errors on rural roads

- A small number of error types account for most crashes on rural roads
- Most common error was overcorrection after straying onto the unsealed shoulder

Error	Frequency
Overcorrection after straying onto unsealed shoulder	8
Failed to give way	5
Fell asleep	4
Lane excursion	4
Loss of traction/overcorrection on unsealed surface	3
Drove off road	2
Change into occupied lane	1
Evasive manoeuvre (animal on road)	1
Fail to give way to approaching traffic	1
Failed to stop	1
Failed to appreciate stationary vehicle	1
Failure to monitor speed of other traffic	1
Left sealed surface	1
None - vehicle component failure	1
Overcorrection after straying into opposing lane	1
Panic braking	1
Rolled vehicle	1
Simultaneous overtaking	1

(Based on Austroads 2014)

Road user errors

What level of “non-compliance” should be considered in a Safe System?

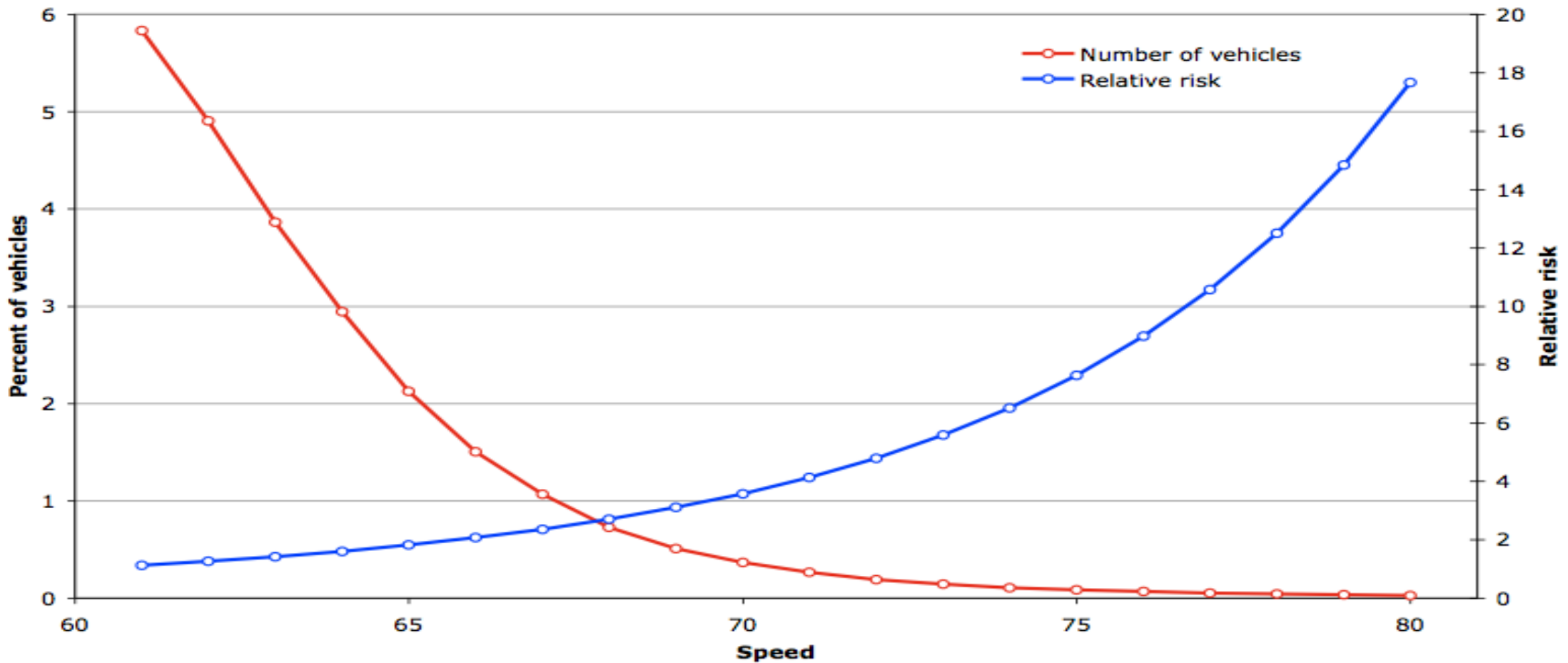
- A 10,000:1 rule? How long before a crash occurs?
- People make errors
- What systemic solutions and redundancies can we implement to prevent such errors becoming fatal and serious injuries?
- No victim blaming, consider innocent bystanders.



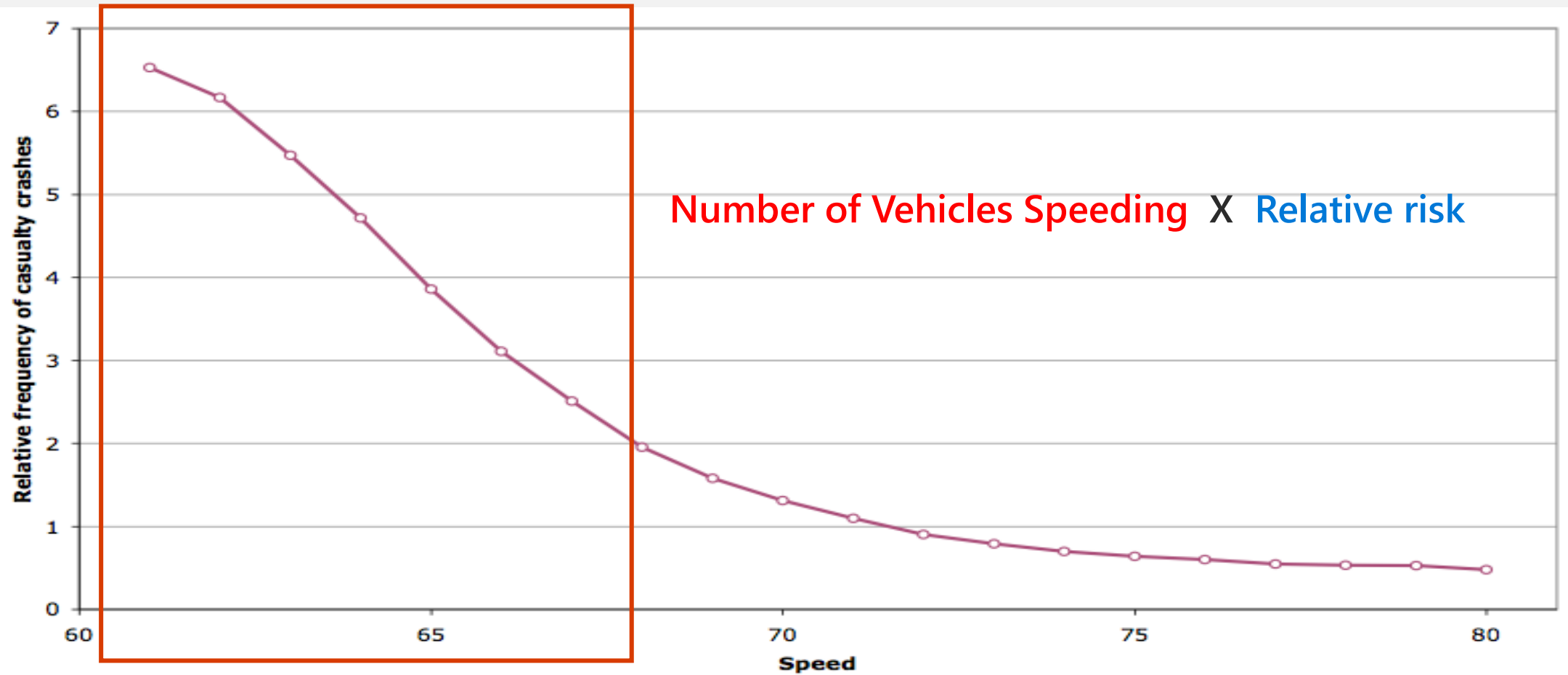
- Example: red light running has been a feature of traffic signal operation and design for decades

<http://www.baseladenow.com.au/news/through-a-red-light-drivers-didnt-even-flinch/story-e6frea6u-1226077647140>

Example: low-level speeding



Example: low-level speeding



Monitoring System Failures



Monitoring System Failures

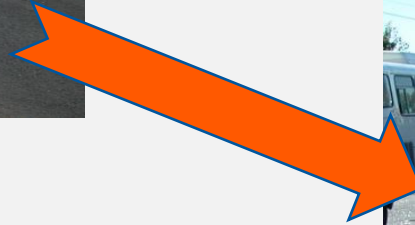




Austrroads

Monitoring System Failures

Who or what caused the crash?





Austroads

Monitoring System Failures

~~Who or what caused the crash?~~



How did the road transport system allowed this death or injury to occur?



Monitoring System Failures



*Current crash databases are not geared towards
“System Failures”*

*Current crash databases are geared towards identifying
single / simple causal factors (usually driver error)*



Thank you

Austroads. (2014). "Providing for road user error in the Safe System." Austroads, Sydney, Australia.

Reason, J., Hollnagel, E., and Paries, J. (2006). "Revisiting the «Swiss cheese» model of accidents." *Journal of Clinical Engineering*, 27, 110-115,

Wundersitz, L., Baldock, M., and Raftery, S. (2011). "The relative contribution of system failures and extreme behaviour in South Australia." Centre for Automotive Safety Research, Adelaide, Australia.