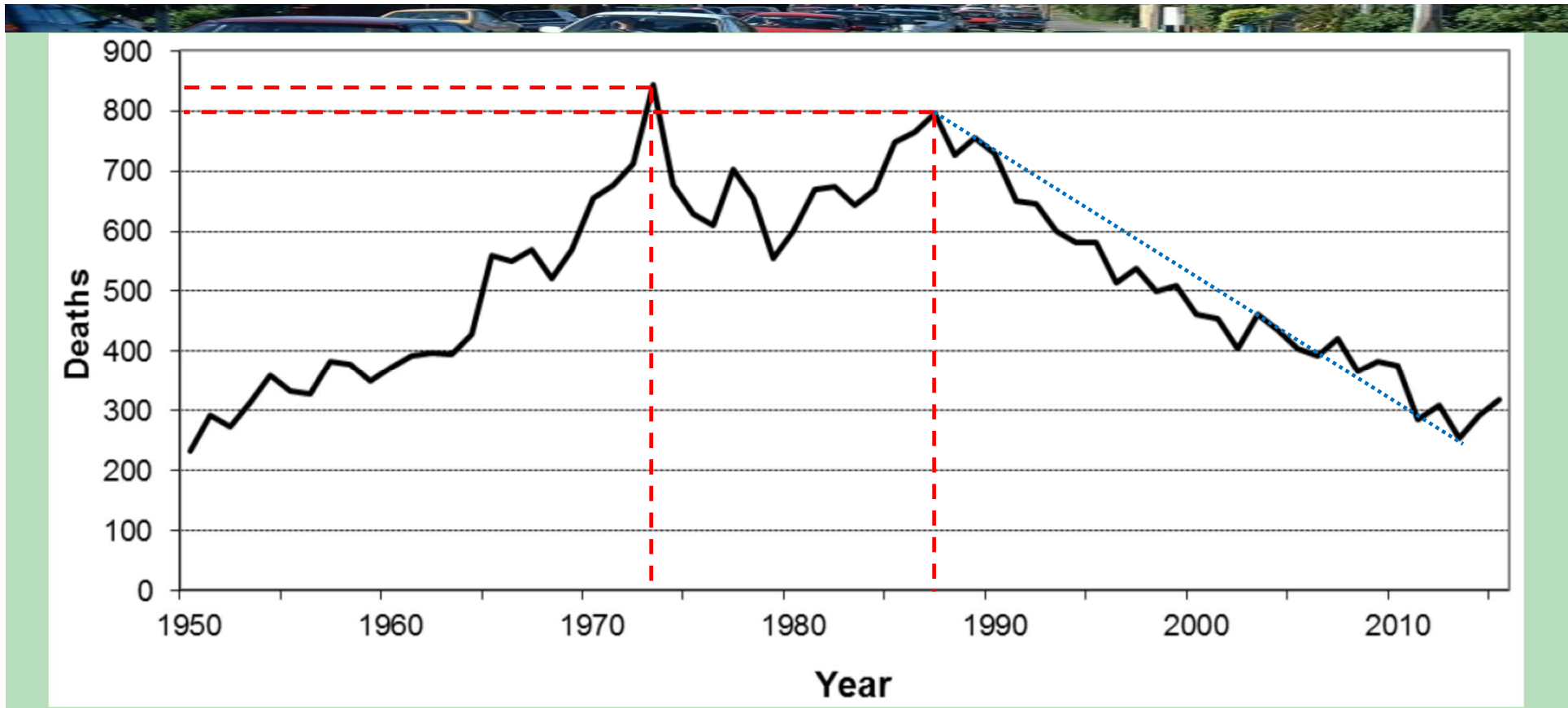


# **Road Safety Improvement: Identifying a Reasonable Guide**

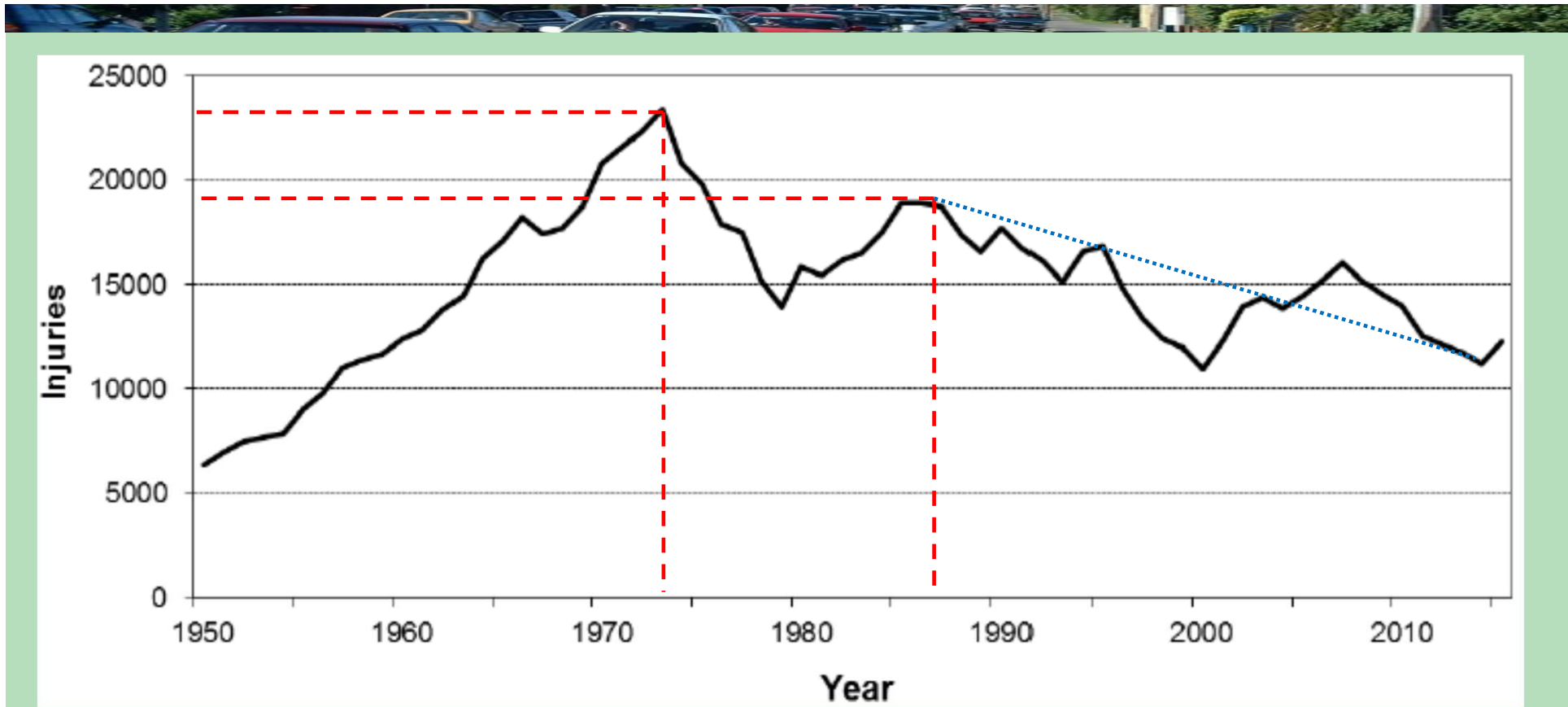
Alan Nicholson

University of Canterbury

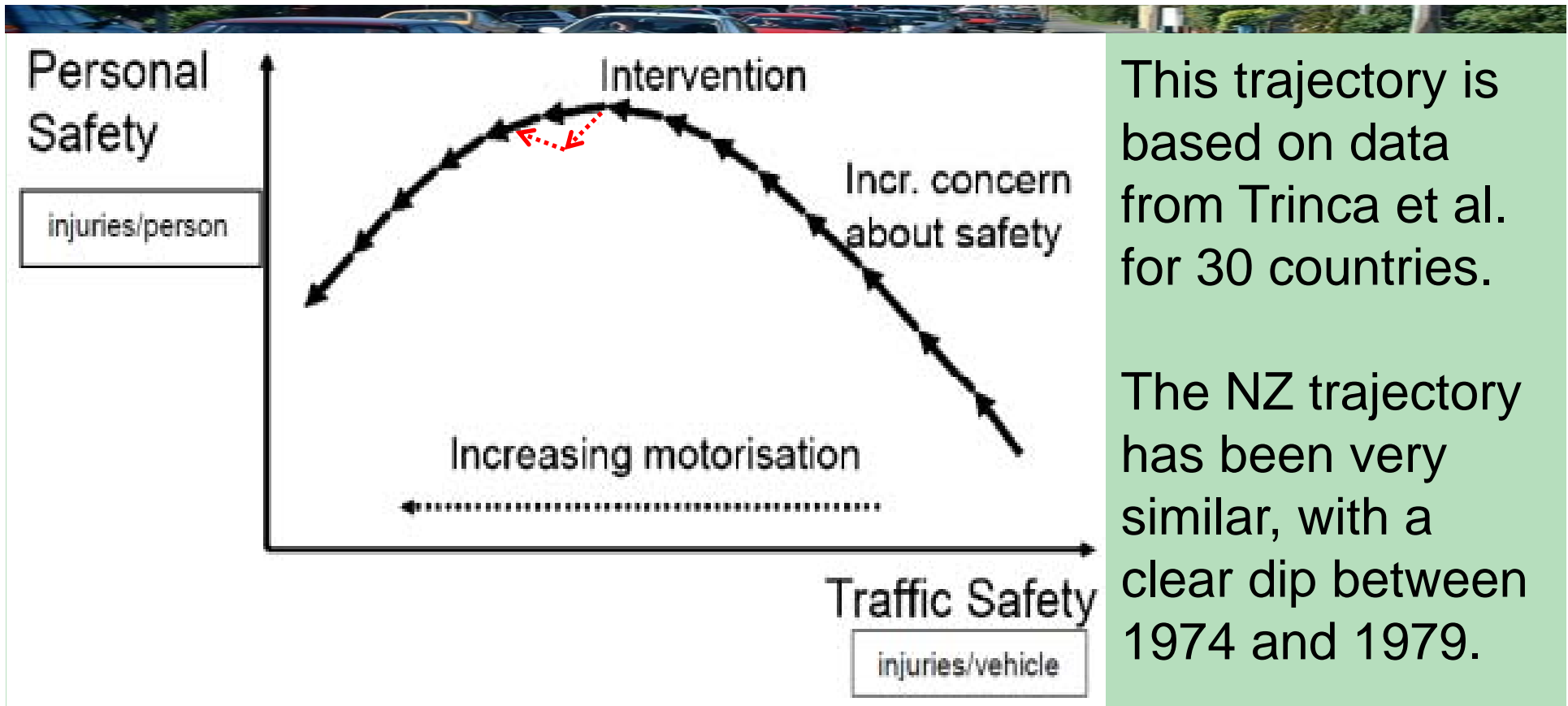
# Road Deaths in NZ (1950-2015)



# Road Injuries in NZ (1950-2015)



# Personal & Traffic Safety



This trajectory is based on data from Trinca et al. for 30 countries.

The NZ trajectory has been very similar, with a clear dip between 1974 and 1979.

# Genesis of Road Safety Strategies

In NZ, there has been a steady improvement in personal & traffic safety since 1987, despite increasing motorisation:

- triggered by publication of “Guidelines for Accident Reduction & Prevention” (GARP) by IHT in 1987;
- followed by adoption of comprehensive road safety strategies in UK, NZ, Australia, Sweden, Netherlands, etc.

GARP said “defining overall objectives & setting quantified targets” is an essential ingredient of such strategies.

# Safety Strategy Evolution

NZ's first comprehensive strategy was adopted in 1991:

- it did include overall objectives & quantified targets.

The 1995 & 2003 strategies retained quantified targets:

- shift away from quantified targets in 2010 strategy.

The Netherlands adopted the 'sustainable safety' concept in 1991, while Sweden adopted the 'Vision Zero' in 1997:

- they are similar, but the latter is more 'radical', being based on "human life & health being non-negotiable".

## A Realistic Expectation?

Proponents of 'Vision Zero' say "no loss of life is acceptable":

- this encourages a very literal interpretation of 'Vision Zero';
- it encourages argument for the complete elimination of traffic deaths & serious injuries.

Is this reasonable?



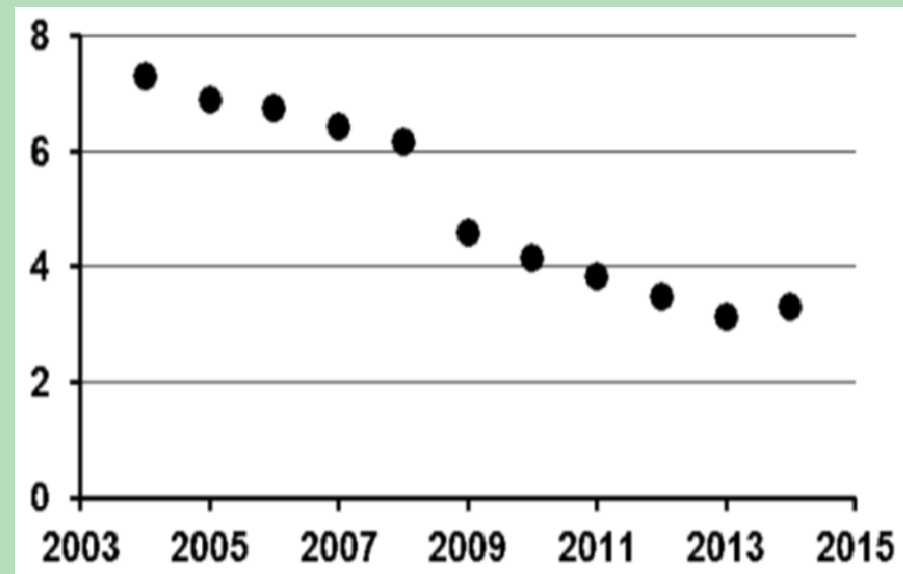
NZ Cycling Action Network (2016)

# Relative Risk of Road Travel

The relative risk =  $(A/B)$ , where:

- A = probability of death on road (per hour of travel)
- B = probability of death (per hour doing other everyday activities)

In UK,  $(A/B)$  in 2014 was less than half the 2004 value.



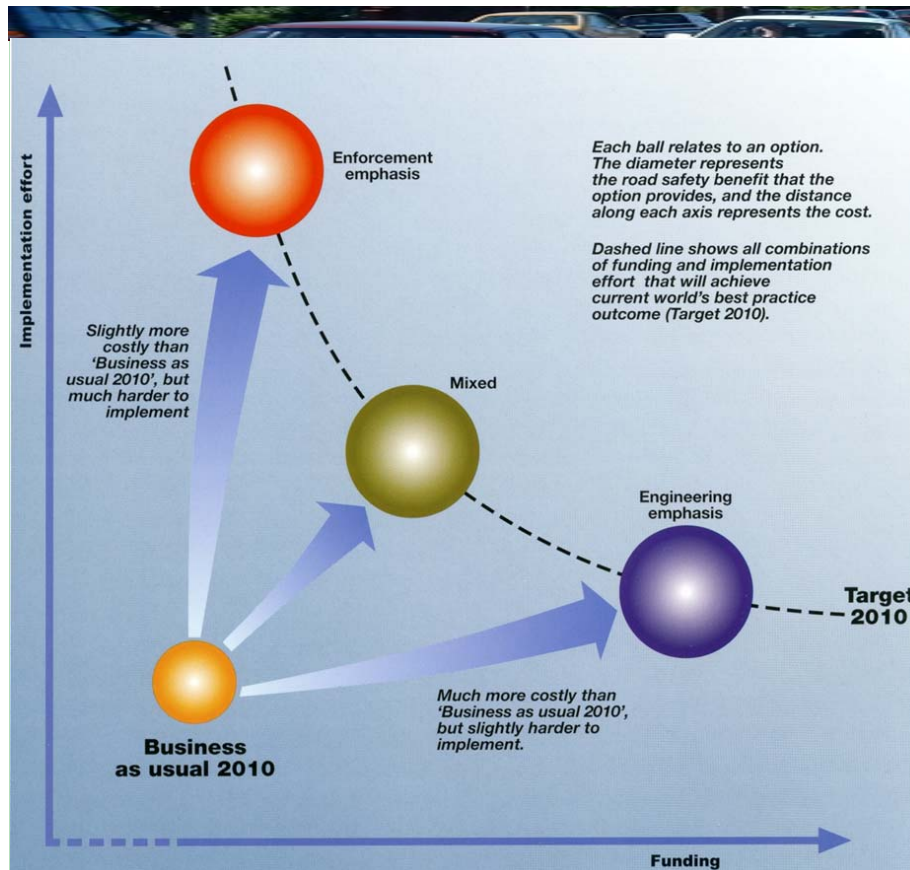
Is relative risk  $< 1$  reasonable?



# Important Issues to Consider

- technical feasibility ~ how robust & reliable is the technology?
- affordability ~ would funds be better spent on health services?
- implementability ~ would the interventions be too intrusive?
- credibility ~ most people know that human life & health are not non-negotiable ~ many activities involve trade-offs between:
  - the disbenefit of death or injury that might occur;
  - the benefit they expect to get from the activity.

# Affordability & Implementability




The 2003 strategy considered two approaches:

- a greatly increased emphasis on enforcement;
  - too hard to implement;
- a greatly increased emphasis on engineering;
  - not affordable.

A mixed approach was adopted.

# Meanings of Risk



The term 'risk' is widely used in road safety & has a range of meanings:

- the probability of a crash;
- the social cost of crashes per veh-km;
- the frequency of crashes per km ('collective risk') or per veh-km ('personal risk').

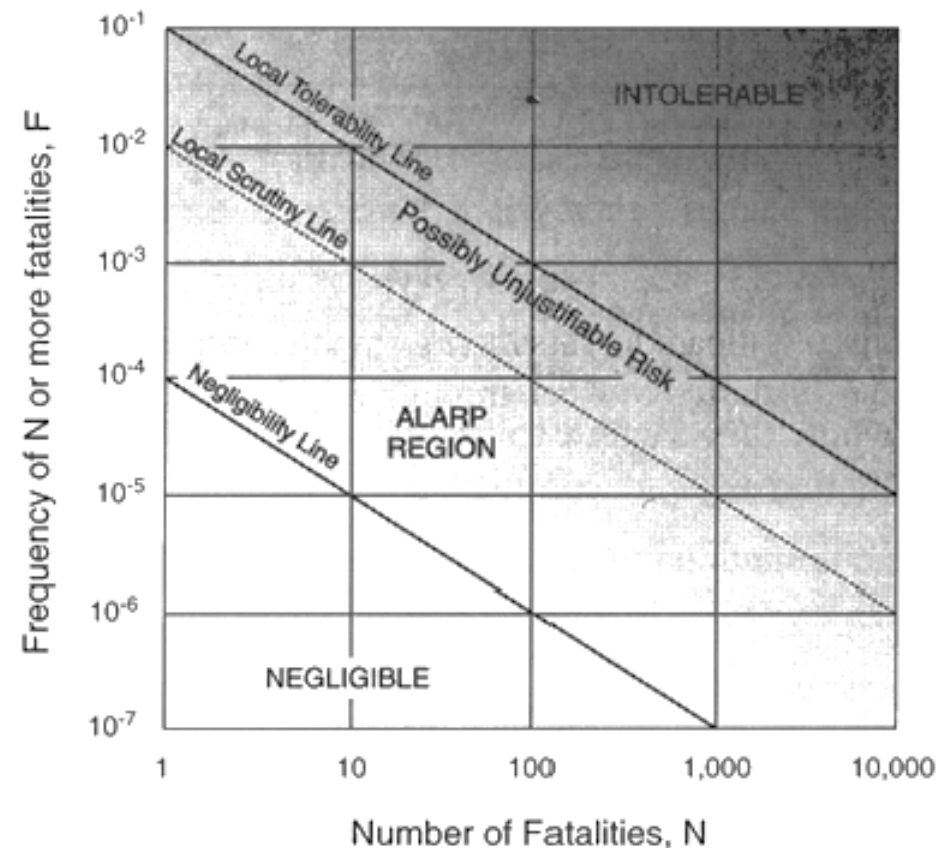
In risk management, risk is the sum (over all possible outcomes) of the product of the probability & consequence of each outcome.

# Risk Tolerability & Acceptability

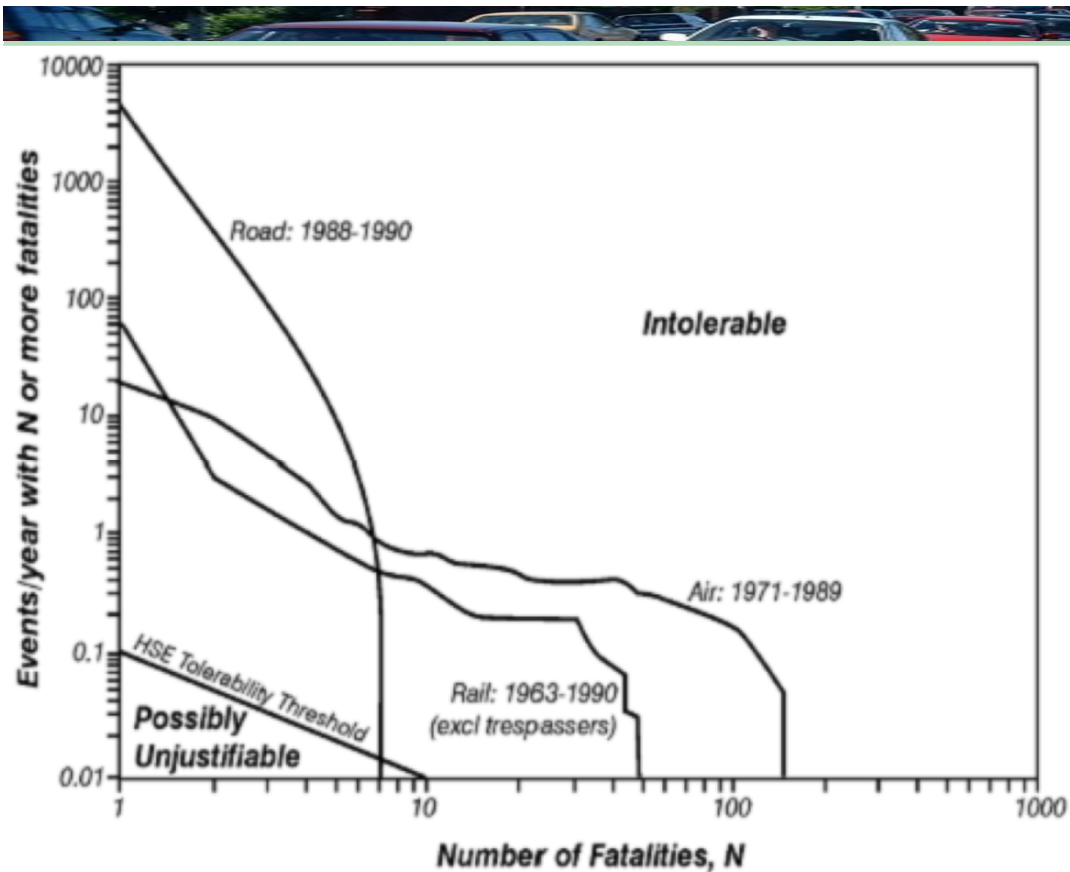
Risk Tolerability reflects willingness of society to live with a risk;

- depends on frequency (F) of events involving N or more deaths.

Risk Acceptability ~ reflects willingness of individual to accept a risk.



# Tolerability of Transport Risk



FN curves for UK quite different for different modes.

NB. The FN curves all lay well inside the HSE's 'intolerable' region.

# Risk Acceptability Factors

Risk acceptability depends upon a wide range of factors, e.g.:

- voluntary? controlled by self? familiar? distributed fairly?

The relative importance of the factors not clear:

- such information would aid development of a safety strategy;
  - that receives greater public acceptance & ‘buy-in’;
  - that is more effective & efficient.

# Conclusion

Need a long-term goal, plus quantitative interim targets, that are realistic & credible:

- discourage extremist views & help gain wide public support;
- incentivise road safety staff.

Should learn from risk management area:

- improve understanding of factors affecting risk acceptability;
- ‘tighten-up’ the use of the term ‘risk’;
  - reduce miscommunication, misunderstanding & confusion.