

10 KEY FACTORS THAT INFLUENCE RISK PERCEPTION IN THE SPEED LIMIT CONTEXT

Lower speed limits reduce road trauma. The evidence is unquestionable (see the [Speed Limit Series - Paper 2 from Safe System Solutions Pty Ltd](#) if you need convincing). But the data, science and evidence aren't enough when we're dealing with something that impacts the community daily. We need to better understand **how people perceive speed limits** (in a sense, how they perceive risk on the roads).

REDEFINING RISK:

High speed rural roads are the biggest source of road trauma in Australia and New Zealand. Yet the public is least likely to support speed limit reductions on these roads. So, why do the risks on the road network that cause the most fatalities and serious injuries (and are furthest from a Safe System) not get support from the public for intervention using speed limits?



At a macro level, populations perceive the risks of road crashes in line with the actual statistical risk (Beer and Ziolkowski). However, at a micro level, based on the correspondence received by road authorities, and the Monash University Accident Research Centre's investigation into Community Attitudes to Speed Limits (Lahaussé et al) the public "does not fully understand the consequence of speeding in relation to crash and injury risk, the environment, amenity and travel time".

A similar concept was explored in the late 1980s in the USA with respect to environmental health risks. The US EPA discovered discrepancies between the environmental health risks that were killing people and the environmental health risks that angered and frightened people. In 1987, following the identification of this concept, Peter Sandman's now famous article **Risk Communication: Facing Public Outrage** was published in the United States Environmental Protection Agency Journal.

Sandman argues that addressing the factors that cause the greatest casualty rate may not be the best factors to target to achieve the most benefit. Sandman also argues that risk communication is not an effective way to change the **public's perception of that risk**, but that there is more benefit in policy makers' understanding the public's perception of risk and shifting policy directions to take this into account.

The core problem is one of definition. To the experts, **risk** means expected annual mortality. But to the public (and even the experts when they go home at night), risk means much more than that. Let's redefine terms. Call the death and serious injury rate (what the experts mean by risk) "**hazard**". Call all the other factors the public see, collectively, as "outrage."

Risk, then, is the sum of hazard and outrage. The public pays too little attention to hazard; the experts pay too little attention to outrage. Not surprisingly, they rank risks differently (Sandman).

This changes our definition of 'risk' from the traditional equation:

$$\text{risk} = \text{likelihood} \times \text{consequence}$$

to a new equation:

$$\text{perceived risk} = (\text{likelihood} \times \text{consequence}) + \text{outrage}$$

or

$$\text{perceived risk} = \text{hazard} + \text{outrage}$$

Let's look at what we know about these two elements:

HAZARD:

Under Sandman's definition of risk, the term 'hazard' represents the traditional definition of risk (likelihood x consequence). We can infer that the further a road environment (and associated speed limit) are from Safe System principles, the greater the risk.

We have a wealth of knowledge about what influences 'hazard'. Things like traffic volume, access points, roadside severity, separation, delineation... and the list goes on (more than 70 factors/variables in some of our risk assessment tools).

OUTRAGE:

There are ten key factors that have a large influence on the public's perception of a speed limit.

1. Control

The majority of the population feels safer driving than being a passenger (Sandman). When prevention and mitigation are the individual's choice, the tolerance to risk is much higher. This creates a distorted perception of the driver's risk. Thus, many drivers are sure that they can safely drive at a faster speed than the speed limit and as a result are outraged at the posted speed limit.

2. Voluntariness

Voluntarily exposing oneself to a risk is more acceptable to people than a risk that is forced upon them. Consider the difference between smoking and being exposed to passive smoke. When it comes to speed management, speed choice is voluntary for the driver. Adding limits on the system increases outrage to drivers because their choices have been narrowed. By contrast, a pedestrian is forced to be exposed to the risks associated with a driver's speed choice or the government-imposed speed limit thereby increasing the pedestrian's outrage if they feel like they could be struck by a vehicle.

3. Fairness

People who are forced to endure what they perceive as a greater risk than their neighbours, without access to greater benefits, have a high level of outrage. This is accentuated if the rationale for the perceived discrepancy appears to be the result of politics or bureaucracy rather than based on science.

The 'fairness' outrage factor is especially evident in the application of School Speed Zones across Australia. In Victoria, past practice was to only reduce the speed limit outside school boundary roads that have gates directly accessing that road. As a result, there were school crossing locations where school children cross roads that did not have a School Speed Zone. This caused significant outrage from parents whose children cross the road at these crossings, when others' children are protected by a School Speed Zone.

4. Effect on Vulnerable Populations

The level of outrage increases with the vulnerability of a population. This includes the elderly, the sick and especially children. As a result, any speed limit reduction that is linked to these populations is viewed more favourably by the public. Conversely, the perception of not protecting these members of the population with lower speed limits causes outrage.

This illustrates the concept of artificially enhanced risk awareness. This usually occurs in situations where people are concerned for the protection of vulnerable road users.

5. Identifiability of the Victim

The more identifiable the victim the higher the outrage. Because road deaths are categorised by statistics they create considerably less outrage. Thus, the majority of the population see road trauma as an abstraction.

Some jurisdictions identify road victims through advertising; however the population still sees road deaths and serious injuries as a generalised notion. Thus, they feel the need for risk reduction measures is lessened.

6. Morality

When society decides something is an unacceptable risk, a base for outrage is established. The 2019 number of people killed on Australian roads was 1,137 and around 20,000 people seriously injured. If next year 1,137 people were killed and 20,000 were serious injuries from, say dog attacks, the outrage level would be much higher than that if these figures are seen in the road crash statistics.

7. Risk-Benefit Ratio

On high-speed rural roads, people overlook the risks if they themselves gain benefits. A population is more willing to accept a risk when they feel the benefit to them justifies the risk, when they feel the sacrifice makes sense.

One explanation for the discrepancy between some of the public's expectation for speed limits and the scientific risks associated with these issues is the concept of individual risk versus collective risk.

Consider a rural road with a 100km/h speed limit, no median barrier and unprotected roadside hazards. There is overwhelming evidence that reducing speed limits on this road will reduce the risk of a crash, yet this approach is often not palatable to some members of the public.

This risk reduction is measured as a cumulative risk for all road users. From the individual's perspective there may not appear to be a measurable reduction in risk and the individual weighs up this small increase in risk against time savings (or elects to accept a higher level of risk). However, when all these small increases in risk are added together, significant reductions in road trauma occur with speed limit reductions.

8. Familiarity

Unusual or mysterious risks increase outrage. Driving is a familiar task to many.

In the International Journal of Risk Analysis, 2006, Evans et al. show that a percentage of any population will drive between two destinations because they perceive the risks are too high to fly. However, the statistics clearly show that the risk of driving is, at minimum, over 50 times that of flying. A critical factor in this anomaly is the familiarity of the risk associated with driving.

9. Memorability of incidents

A memorable crash such as the Kerang railway level crossing crash in Victoria in 2007 makes a risk easier to imagine, and thus heightens the public's perception of risk. As a result, reducing the speed limit to 80km/h at railway level crossings was generally accepted by the community. This is often simply referred to as the "window of opportunity". Once the memory has faded the window is closed.

10. Diffusion in time and space

If hazard A kills 50 anonymous people per year across the country, and hazard B has one chance in 10 of destroying a neighbourhood of 5,000 people sometime in the next decade, risk assessment tells us the two have the same expected annual mortality: 50. "Outrage assessment" tells us A is probably acceptable to the public and B is certainly not (Sandman 1987).

Road crashes tend to fit into category A.

SO, WHAT DOES THIS MEAN IN PRACTICE?

Amongst the road safety community the Safe System is a well-accepted philosophy. The general principles are easily understood and accepted. In Australia, the principles of the Safe System philosophy are filtering their way into the minds of road policy decision makers and road practitioners. However, understanding the public's outrage factor for speeds plays a critical role in moving towards a Safe System.

Sandman sums up the paradox in a unique way:

"There is a peculiar paradox here. Many risk experts resist the pressure to consider outrage in making risk management decisions; they insist that "the data" alone, not the "irrational" public, should determine policy. But we have two decades of data indicating that voluntariness, control, fairness, and the rest are important

components of our society's definition of risk. When a risk manager continues to ignore these factors – and continues to be surprised by the public's response of outrage – it is worth asking just whose behaviour is irrational?"

The solution is implicit in this reframing of the problem. Since the public responds more to outrage than to hazard, risk managers must work to make serious hazards more outrageous, and modest hazards less outrageous.

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<http://www.safesystemsolutions.com.au/speed-management.html>