Safer Journeys and Safe Speeds: the international context (and NZ)

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Prepared

Some countries I work in…….

- Have laws which allow people to be beheaded slowly with many blows of a sword for certain severe crimes (but less than murder)

Some countries I work in…….

- Our road transport systems do worse for:
  - minor lapses of judgement with no malice to anyone.
  - unsafe speeds
  - and even unsafe speed limits

No-one should die or be debilitated by serious injury for the sake of mobility

Overview of talk

- *Safe systems thinking is often misrepresented*

My conclusions:

1. *Speed is a key element to be managed for safe systems*
2. *There are real versus false and biased source of truth on speeding*
3. *As a society we tend to believe the false evidence and dismiss the real evidence on road safety*
4. *Real evidence shows that we greatly UNDERESTIMATE THE ROLE OF SPEED IN SERIOUS CRASHES*
5. *We also under-estimate the role of low level speeding*
6. *Practical implications of these claims for road safety*

Core principles of Safe system:

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Solution is not better balance skill: encourages more risk-taking

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Safety in working at heights: the risk of excessive physical force is removed.

Principles for success

Failing approach

1. Expects humans to be perfect as a solution to road trauma
2. Victim blaming
3. Focus on preventing the crash
4. Focus on the road surface
5. Accepts prevailing engineering standards as sufficient for safety

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Principles for success

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5. Accepts prevailing engineering standards as sufficient for safety

Successful approach

1. Accepts that humans make mistakes, for which they or others should not die
2. System focussed
3. Focus on preventing the injury/death
4. Focus on roadsides
5. Rejects prevailing engineering standards – they are insufficient for safety

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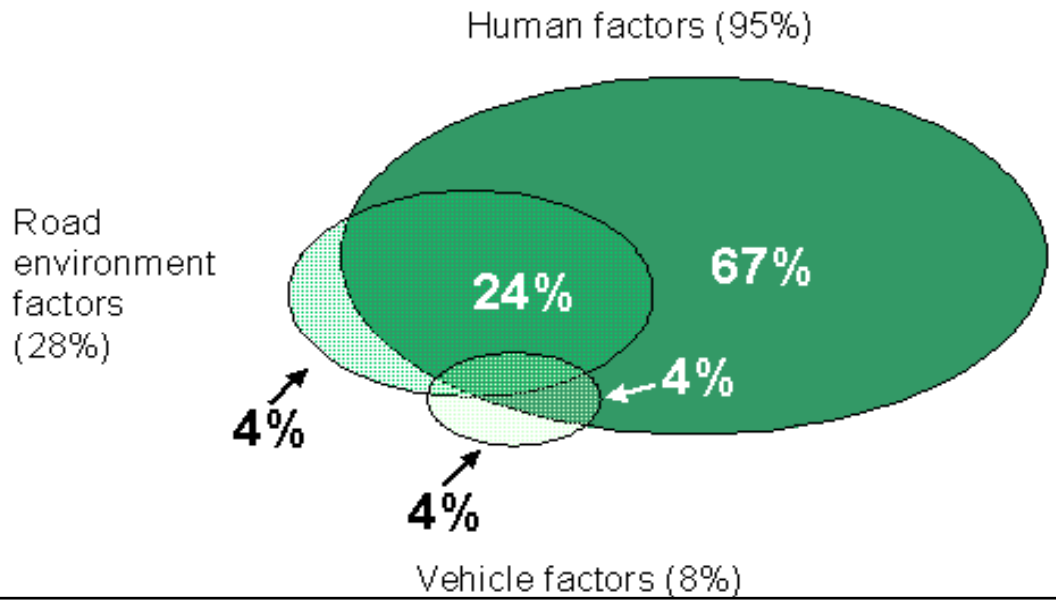
Old model still promoted



Making Salt

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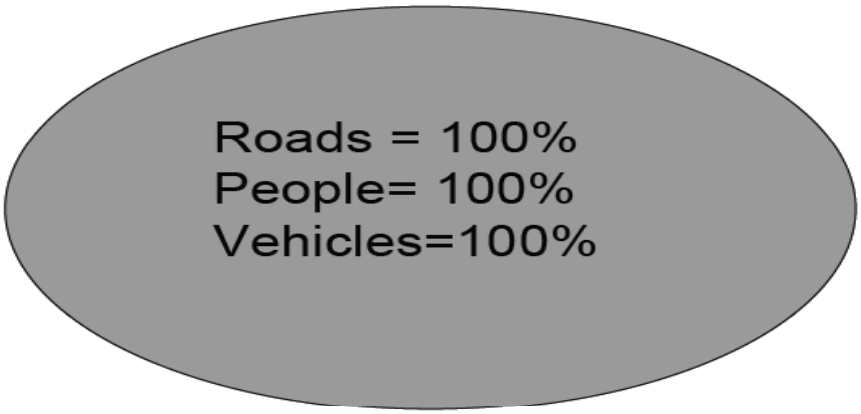
New Model: Safe System & Scientific reality



- Focus on solutions not problems: fully remove any one element and problem can't occur

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Lack of understanding of what Safe System implies we should do

"We need 5 star drivers in 5 star cars on 5 star roads"

NO

Lack of understanding of what Safe System implies we should do

"We need 5 star drivers in 5 star cars on 5 star roads"

We need enough stars on cars and roads and speed management to save …. 1 star drivers.

<u>The key element we need of drivers which we cannot expect vehicles and roads to overcome (in our lifetimes) is speed</u>

The Forms of Evidence on Speeding

1. Media
2. Police estimates of speeding in crashes
3. Comparisons of roads in terms of speeds and crash rates
4. Comparisons of people- their speeds and crash histories
5. Comparisons of speeds at set locations of those who crashed there and those who did not
6. Comparisons of crashes and speeds before and after fixed speed cameras (including point-t-point/section control)
7. Comparisons of crashes and speeds before and after mobile speed cameras
8. Comparisons of speeds and crashes before and after speed limit changes
9. Personal experience (and comparison with others or within our own experience)

Lets look at each of these bodies of evidence

- But, before we start:

"Lies, damn lies, and statistics"

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1. Media: dismiss speed or acknowledge only when extreme

Speed behind biker deaths, say police

New Zealand Herald, Mar 3, 2014

Sound headline, but article really dismissed speed after that

- **'Twit' motorists and 'born-again' older motorcyclists among reasons for high accident rates, expert claims.**
- Road safety expert is quoted "It's an equal amount of stupidity and unfortunate luck" …. [Note- Not speeding]
- Then expert is quoted as referring to: lack of experience; the modern bikes can outride the rider; riders lose their edge…. [Note- Not speeding]

Not a credible source of information.

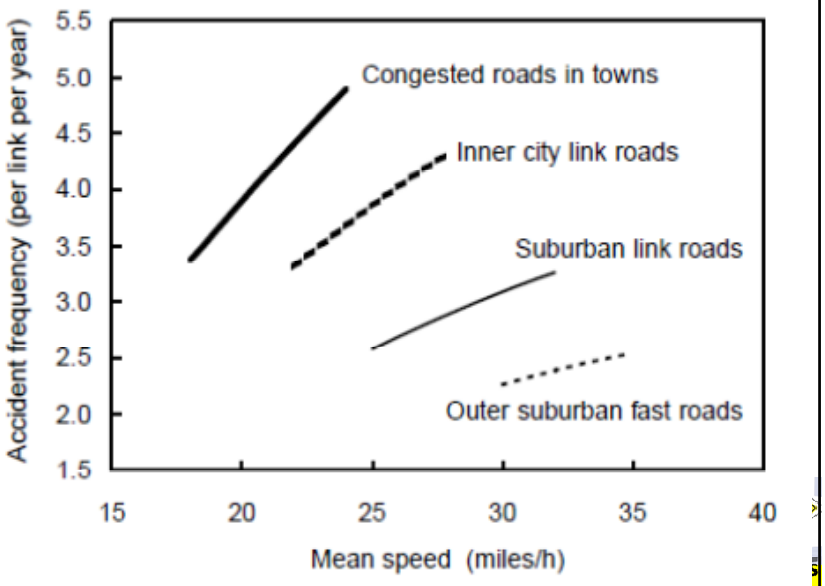
2. Police estimates of speeding in crashes

- We just saw what the media did with the evidence anyway…
- But, is it right?
  - (very difficult task- not a criticism of Police)
  - Internationally consistent estimate - around 25-35% of deaths involve speeding
  - Under-estimate: Process misses many speeding crashes
    - Esp. single vehicle & pedestrians fatalities and SI

3. Comparisons of roads in terms of speeds and crash rates

Confounded by factors of the road.

(But, controlled for in TRL study)



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4. Comparisons of people- their speeds and crash histories

- Examine the driving speeds of drivers and their crash histories

Same finding: drivers who drive faster have more crashes

Is this research perfect?

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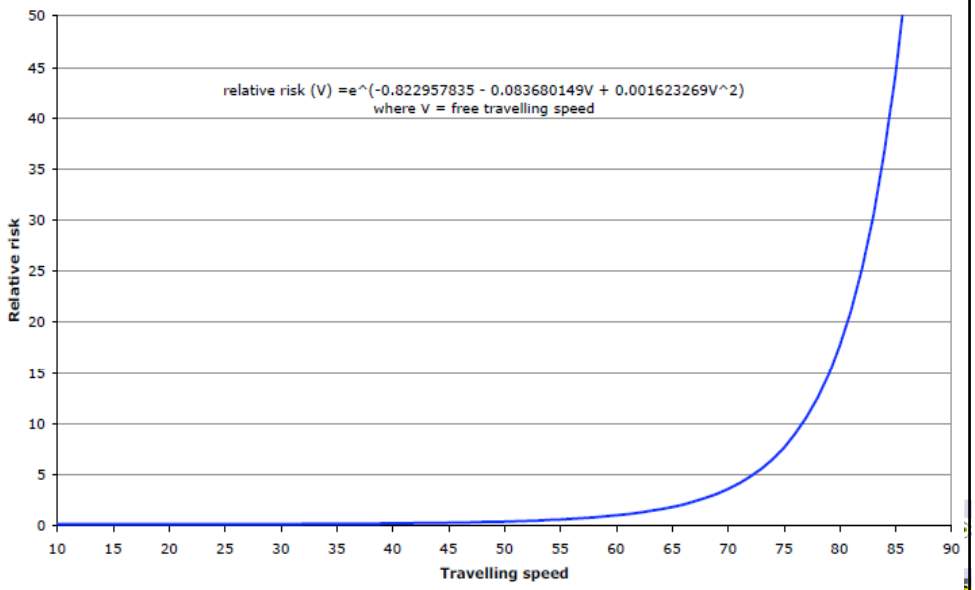
5. Comparisons of speeds at set locations of those who crashed there and those who did not

Tight sound case-control research: Crash vs no-crash



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6. Comparisons of crashes and speeds before and after fixed speed cameras

Many studies: Consistently show large benefits of speed cameras.

Independent evaluation of the first 28 fixed speed cameras in NSW:

- 71% reduction in speeding
- 89% reduction in fatalities
- 20% reduction in injuries
- (taking untreated rest of state as control shows huge gains)

Point-to-point evaluations in Europe also show large reductions in serious crashes

(best international review by World Health Organisation, UN, Cochrane Library all agree)

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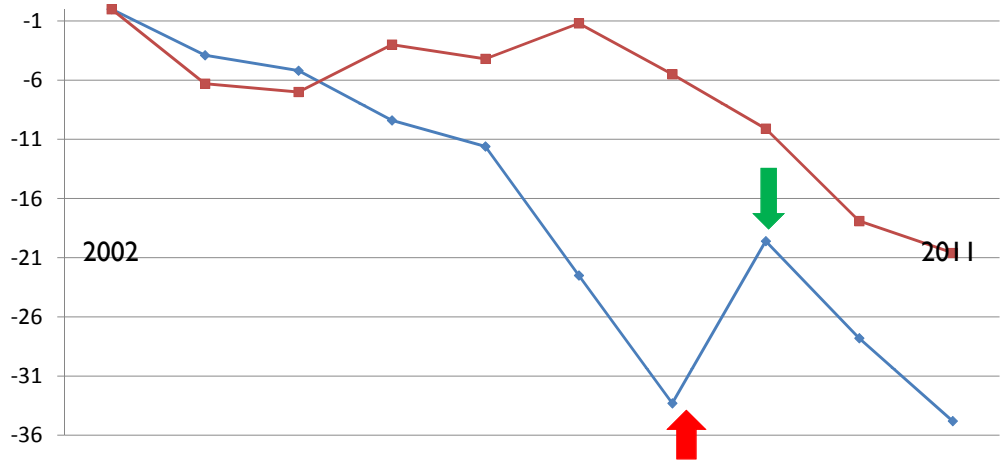
7. Comparisons of crashes and speeds before and after mobile speed cameras



Many studies: Consistently show large benefits of mobile speed cameras and enforcement (including in NZ).

Most extreme practical demonstration .....NSW.

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8. Comparisons of speeds and crashes before and after speed limit changes

- Many examples. Consistently (just a few exceptions) show serious crash reductions in line with predictions
- Great Western Highway, NSW, reduced from 110 to 100 km/h. 26% reduction in casualty crashes.
- Australia urban default down from 60 to 50: 25% decrease in casualty crashes.
- NSW School zones down to 40: 46% decrease in casualty crashes
- Most extreme example recorded by Sliogeris in Victoria

Speed limit up 10km/h: casualty crashes up 25%

Speed limit back down 10km/h: casualty crashes down 20%

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9. Personal experience (we speed and don't kill anyone)

- I suggest - key cause of resistance to scientific evidence and reality of physics
- We don't make judgements based on scientific evidence; we make them on personal experience
- Thus, we don't believe the data on speeding plus we are motivated not to. We want to speed, for thrill or to get there sooner or on time.
- The bias is not in the science; the bias (shown next) is in the public and the news outlets which must cater to this bias to sell papers and TV viewing, (and car ads).

Personal experience is misunderstood and thus misleading

Psychology of Speeding and our perceptions and beliefs

Relative Judgement is critical to choices

- Why?
  - "Absolute" judgement is a relatively new invention
  - We are generally better at relative
  - survival.
- Of risks
- Of speeds

Question:
Are you a

Much lower than average	Lower than average	Slightly lower than average	Same as average	Slightly higher than average	Higher than average	Much higher than average

driver

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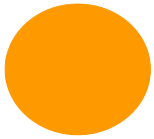
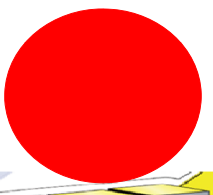
Most of us think we are better drivers than others
And- it's a general effect: Optimism bias

Worse than average	Above average	Better than average

2.1%





We take risks deliberately and we speed.

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Personal Risk for NZ (and everywhere) is easily misunderstood

- 296 deaths in the year to end 21 March, 2014 (in 261 fatal crashes) for a population of 4.47m.
- As an average driver with average risk, to cause one fatal crash you would need to drive (at average km per year) for thousands of years (many, many lifetimes).
- But, we base our judgement of our own driving skill and ability to speed on a few years/months of driving.
- The science is correct about speeding and risk but…..multiple lifetimes of driving to detect the difference personally.
- Speeding: Think publicly- act personally

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Risky behaviour

- Some risk taking is unintentional but most is deliberate

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Response to the latest NZ Speeding advertisement (great ad)

Mostly very positive and in agreement, but….

Psychological defences as well.

Responses:

“They should do one for texting and driving.”

“dude in the first one would have made it if he had a hemi.”

(ways to distinguish ourselves as well as optimism bias)

[Not a critique of the ad; analysis of psychology of avoidance]

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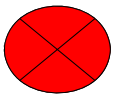
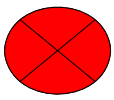
Reality and perception

True information and generally believed	True information and not generally believed
	
Misleading information and generally believed	Misleading information and not generally believed
	

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Reality and perception mismatch

True information and generally known & believed NONE	True information and not generally known & believed 1. Comparisons of roads in terms of speeds and crash rates 2. Comparisons of speeds at set locations of those who crashed there and those who did not 3. Comparisons of crashes and speeds before and after fixed speed cameras (including point-t-point/section control) 4. Comparisons of crashes and speeds before and after mobile speed cameras 5. Comparisons of speeds and crashes before and after speed limit changes
Misleading information and generally known & believed on speeding Media Personal experience	Misleading information and not generally known & believed Police estimates (but disbelief is opposite direction to error)

Why are the issues of speed and speeding not generally accepted

- Almost Complete Mismatch of belief and truth (just shown)
- Personal experience
- Optimism bias
- We don't want to believe: speeding is fun and convenient
- Media (who earn a lot of money from advertising of cars, and who like most of us have personal experience to go on) promote alternative views, and generally only acknowledge speeding when its extreme
- Misguided theory
  - (more looking at speedo, more fatigue,…)

Analysis of the Evidence for the role of speeding in serious crashes

- The evidence is irrefutable by any sensible person not motivated to have a different view.
- We are at the same point in the debate that we reached many years ago with smoking
  - All the genuine and unbiased evidence shows speeding (smoking) is killing many people
  - Smokers (speeders) are more likely to die young
  - there is direct biological evidence for the underlying mechanism in laboratory studies and physical reality
  - the motivated apologists for the tobacco (car/racing) companies and smokers (speeders/motoring writers) claim that the proof is not absolute
  - Those claiming that speed is not a key road safety issue are
    the public health mass murders of our time
    (some deliberately, some by innocent negligence).

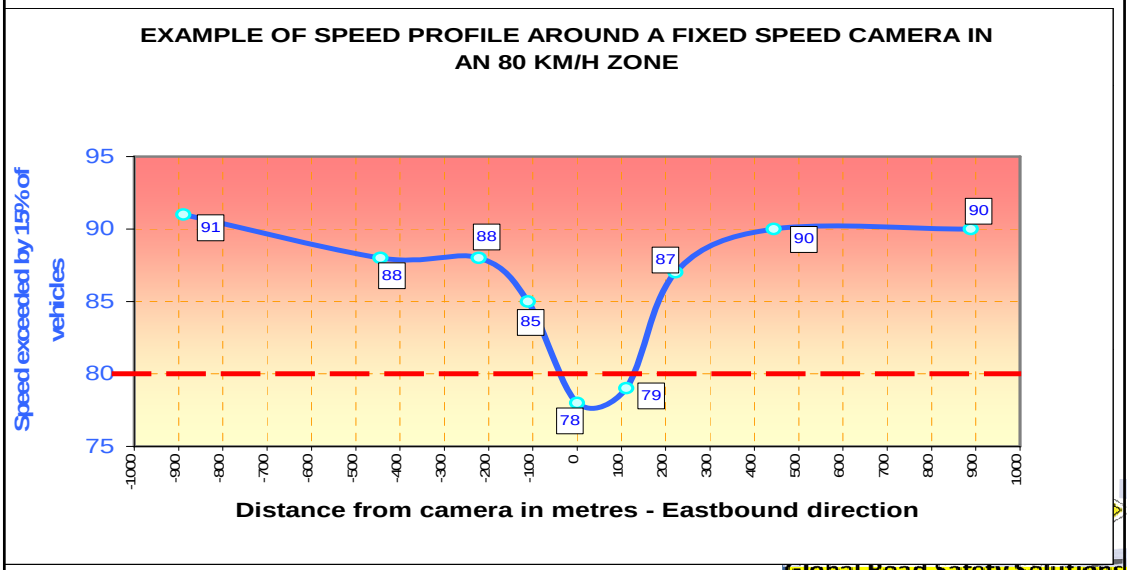
How are speed and tobacco different then?

1. Psychologically different - Personal experience is king: but non-occurrence differs: single versus cumulated risk.
2. People who smoke massive amounts of tobacco are not seen as experts, but racing car drivers are
   (And their MUCH WORSE crash history is not covered in the media)
3. Scientists in general have proven repeatedly that they will give us the truth, but oddly the pro-speed lobby and the media have succeeded in giving the impression that the scientists are biased and the motoring writers and average drivers know more and are not biased.

We are contributing through errors:

Speeding is often inadvertent- really?

NSW Fixed speed cameras



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We are contributing through errors:

Low level speeding is not a major contributor to death and SI- really?

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

Speed band (over speed limit)	Speed limit							Total risk (casualty)	Total risk (fatal)
	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	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%		

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Addressing speed within safe systems

1. Management/leadership
2. Roads
3. Vehicles
4. People

Addressing speed within safe systems

1. Management/leadership
   - **We don't have enough money in any country to deliver a safe system at extreme speeds**
   - Speeds must be managed
   - Focus on low level speeding- helps high level and low level speeding
   - But: Focus on high level speeding- convenient & popular but will encourage low level speeding

Addressing speed within safe systems

2. Roads

- Avoid victim blaming
- Manage injury consequences of crashes: Protect from catastrophic forces
  - Barriers (esp cable, as shown in NZ and Oz and ….)
  - Median barriers
  - Separate road user types
  - Not clear zones
- Manage driver speed choices:
  - Roundabouts
  - Gateway speed treatments (nice evidence from NZ in 2014)
  - Speed humps, etc.
- Speed limits
  - Aim for self-explaining speed limits but don't expect this will go far enough
  - Proposals for 30k/h in inner city is wonderful

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People find clever ways around things- if possible its best to physically engineer out the possibility, not educate & legislate

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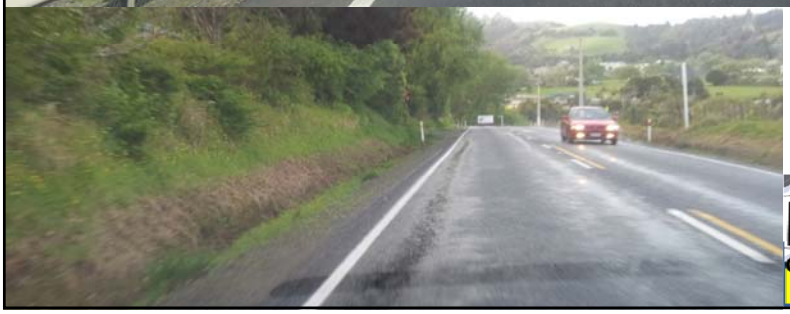
New Zealand- Challenging circumstances & some excellent roads



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Addressing speed within safe systems

3. Vehicles
   - Protect from catastrophic forces
   - Why do we allow vehicles with are capable of 220km/h when we don't have these speed limits. (Car makers believe this sells cars and they are right)
   - Intelligent speed adaptation
   - Speedo displays

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Addressing speed within safe systems

4. People

- If education alone worked we would not need enforcement- we do need it
- Education needs to
  - allow for public (political) acceptance of stronger actions
  - Promote enforcement
- Enforcement is critical. How much is enough:
  - What it takes to create a belief in anywhere anytime significant unavoidable punishment and stop speeding.
- Car handling skills based driver training doesn't work
- Start driving at older age

Anti-road safety & anti-speed views in road agencies ($ is a big issue)

Speed limits are ignored by drivers

Speed limits must be credible

Individual responsibility

Increase skill of drivers

I've seen: Put barriers where they won't be hit, to save maintenance $

CONCLUSIONS

1. *Speed is a key element to be managed for safe systems*
2. *There are real versus false / biased source of truth on speeding*
3. *As a society we tend to believe the false evidence and dismiss the real evidence on road safety (the false claims are more accessible and what we want to believe)*
4. *Real evidence shows that we greatly UNDERESTIMATE THE ROLE OF SPEED IN SERIOUS CRASHES (removing the problem is the best evidence of its contribution)*
5. *We also under-estimate the role of low level speeding*

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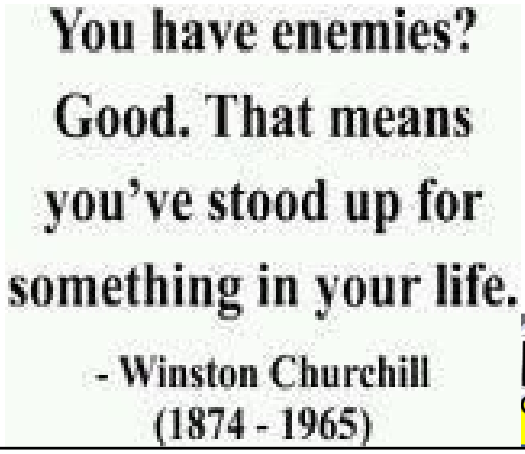
CONCLUSIONS

6. We can manage speeds better with better acceptance and more courageous resistance of the biased and misinformed claims that speeding is not critical; that speed limit reductions don't work; that speed cameras don't work; or that we just need to teach more skill.



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Barriers to Adoption of Safe System

Barrier	Overcoming the barrier
Victim blaming	Innocent people make mistakes. Around 50% (I think 35%) of serious crashes are by drivers not speeding/drinking/fatigued/or taking deliberate risks
It costs too much	Safes system informs investment regardless of level of resources: Focus on preventing the injury not the crash
Building and maintaining to the current standard is sufficient for a safe road	Roads are not safe because they are built to a standard, they are safe when a non-speeding driver cannot kill himself or others
Deaths are inevitable (and acceptable) for progress	A Safe System will stop deaths by accommodating human error
Road users must take some responsibility	Yes- safe systems is about shared responsibility. Avoiding death is not the main motivator of safety anyway
Surely, preventing the crash is best	Yes- but as road authorities, history shows we largely fail at this. It also shows we can do better at preventing the injury

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