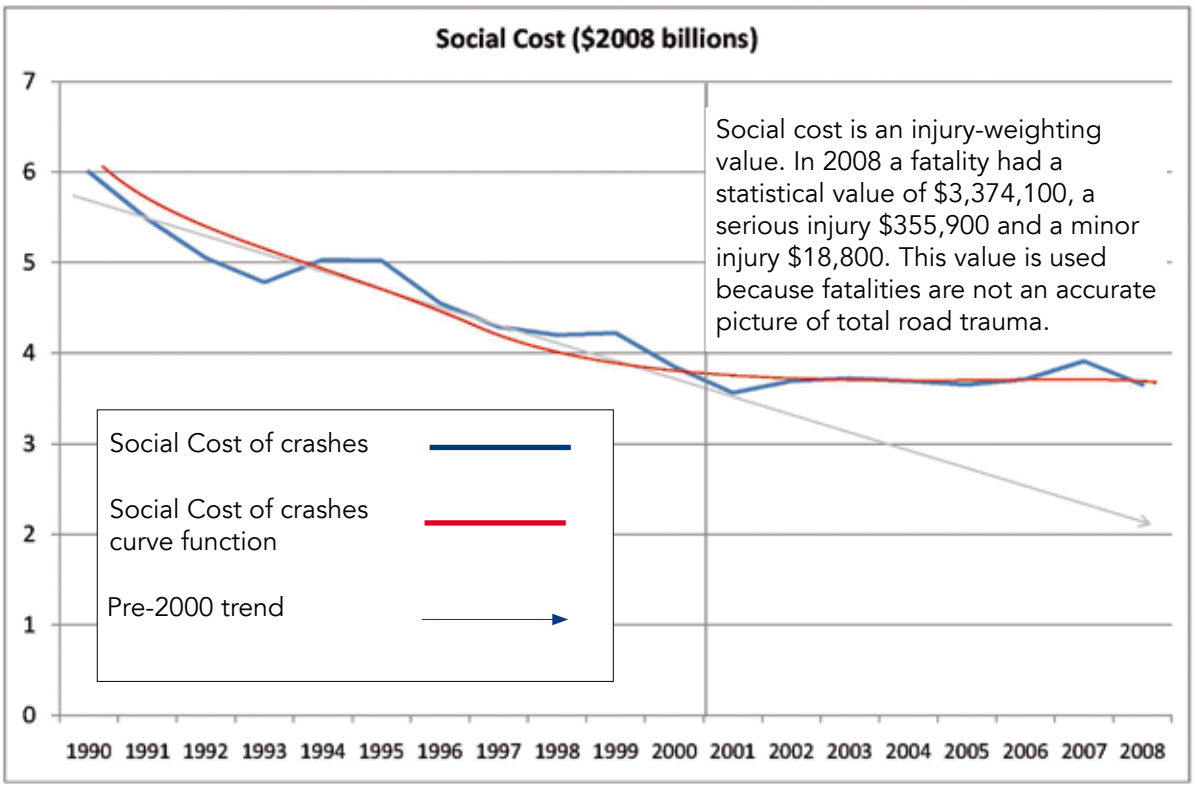
SAVING OURSELVES

No level of death or serious injury from the road system is acceptable in civilised society.

A Discussion Paper on Issues for the 2020 New Zealand Land Transport Safety Strategy

September 2009

1.0 Towards a 2020 Land Transport Safety Strategy - the big picture



New Zealand's progress in road-safety improvement was not demonstrably helped by the Road Safety Strategy 2010. Indeed, the improvement trend which was evident from before 1990 finished in 2001, two years before the 2010 strategy was released.

Unfortunately this trend was not apparent when the 2010 Strategy was developed. This meant that the 2010 Strategy was based on continuing, and indeed increasing the road-crime deterrence techniques that had been so successful since the 1980s. Although many of the targets for road-crime compliance outlined in the 2010 strategy had been achieved there has not been any commensurate reduction in road-injuries.

These facts strongly suggest that New Zealand needs to completely re-evaluate its road safety strategy if it is to reduce the cost of road-safety failure on the community and the Government. Simply tweaking the previous strategy is quite unlikely to make any significant difference, and indeed, the failure to address the issues will, on current projections, lead to more unnecessary death and injury.

Road safety victims are not remembered

The failure to achieve the 2010 Road Safety Strategy goal has cost us more dead than the battle of El Alamein.

1.1 Road Safety Strategy: crime prevention strategy or injury prevention strategy?

Road safety is the only safety field in New Zealand treated as a crime. Each year Police issue speeding tickets to the equivalent of 20% (and breathalyse the equivalent of 60%) of the population over 15 years old. One-third of all offences brought before the courts are traffic-related. The business of road-rule enforcement costs about $300 million a year and returns about $100 million in fines that are recovered and $50 million in fines that are written off.

What sort of "crime" is so universal that 20% of the population has committed it each year? When even the then Commissioner of Police (Rob Robinson) unintentionally becomes an "offender", it is hard to convince anyone that infringing road rules is a "crime" at all, even on the same scale as petty theft or vandalism. Instead of being a crime, minor road rule infringements are perceived as petty "gotchas". Road users make a distinction between unintentional infringement and blatant violation of road rules.

More importantly, the intention to disobey the rules is not the greatest cause of crashes. According to the Crash Analysis System the most common cause of road crashes is "poor observation". People not noticing a potential collision because they are distracted by something else (either outside the vehicle, inside the vehicle or on their minds). Such crashes are not intended or wanted. And while many crashes occur when drivers go "too fast for the conditions", because most occur on bends this may not mean breaking a speed limit, just overestimating their ability and under-estimating the risk. In other words most crash victims are not defying the law. They have, however, failed to meet a safe standard of conduct on the road.

While failure to drive to a safe standard may be the cause of a crash, the effect of the crash is determined by physical impact. Collisions with other moving vehicles or static hazards transfer huge amounts of energy to vulnerable human bodies both inside and outside the vehicle. One badly placed pole or ditch can turn a bad fright into a lifetime of suffering. In many cases the effects of the crash are far more punishment than anything that courts can impose.

ACC Costs
Road-crash treatment and recovery costs are currently around $300 million a year. To pay for this the ACC is imposing a $634-million-per year transfer of wealth from the private sector to build up an investment fund.

Justice Costs
The cost of maintaining road-rule compliance results in a transfer of $290 million for Police and $150 million for fines, penalties and collections from the private to the State sector.

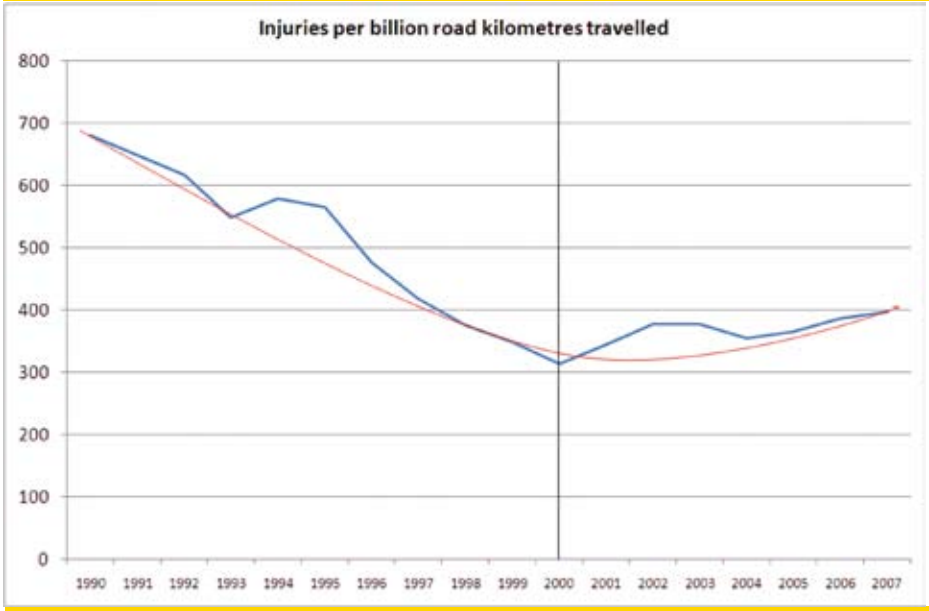
Deadweight Cost
If we count the costs of hospital treatment and justice costs, road safety imposes a deadweight cost on the economy of around $700 million per annum. If the need for the ACC Motor Vehicle Account is added in the figure reaches $1 billion. While this deadweight cost is not entirely avoidable, there is unfortunately nothing in the system which encourages it to reduce. The ACC levy has increased 63% since 2001, while judicial and policing costs have increased 18%. None of this expenditure has reduced the rate or severity of crashes in New Zealand. The current system assumes road crashes are like other crimes in that they are random and unpreventable.
This is, however, not the case. There are significant interventions the Government can make to reduce the cost and impact of crashes in New Zealand. In order of expense these are engineering, legislational and educational interventions to improve the health effects of crashes, and reduce their incidence. These would, however, require a new management approach to road safety.

To date the New Zealand approach to road safety has been to make crashes and their causes illegal and make preventing them a role for Police. In fact, Police cannot prevent many crashes because many are not caused by illegal activity.

As Police rightly observe, "road safety is everyone's responsibility". Police cannot do it alone. To reduce road-safety costs we need a partnership between Police, roading engineers, automotive suppliers, medical specialists and most importantly, the public.

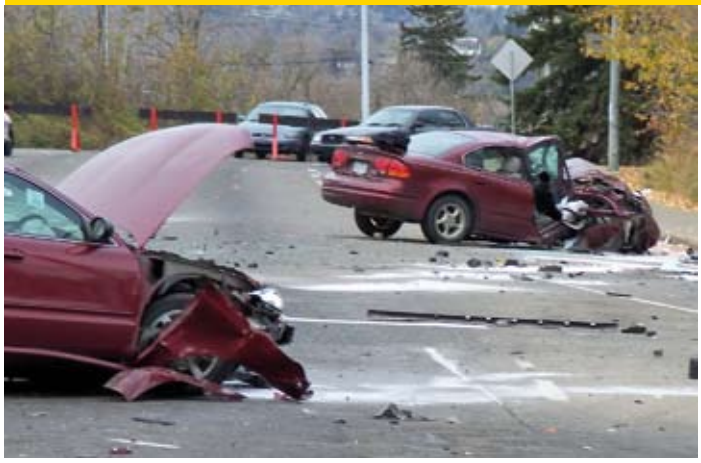
AA Members strongly support police enforcement but like the public they are woefully uninformed about safe roads and road use. A new inclusive safety strategy is needed.

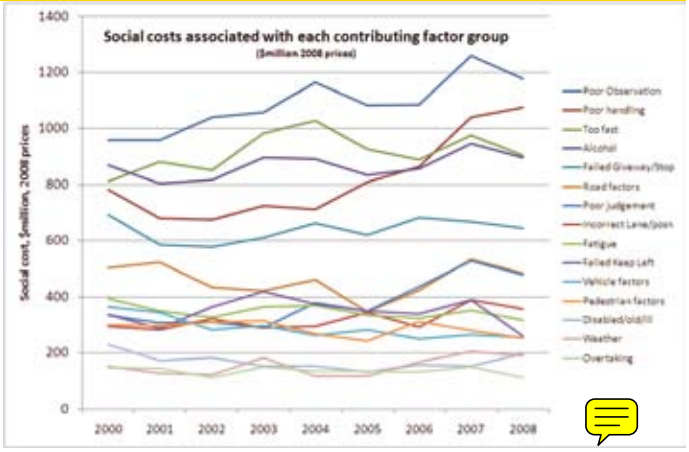
2.0 Trend in road crash injury



Even allowing for the increase in kilometres travelled per person over recent years, it is evident that the rate of injury per kilometres driven is increasing and has done so since the year 2000.
The trend is towards a parabola which is trending upwards again. This is despite the advent of the Highway Patrol and the number of convictions for traffic offences decreasing by five percent in the five years from 1999 to 2003, followed by a 29 percent increase from 2003 to 2008. Speeding infringement notices alone have increased by 34 percent while open road average speeds have decreased. Even the fastest 15 percent of open road drivers travel at 103km/h.

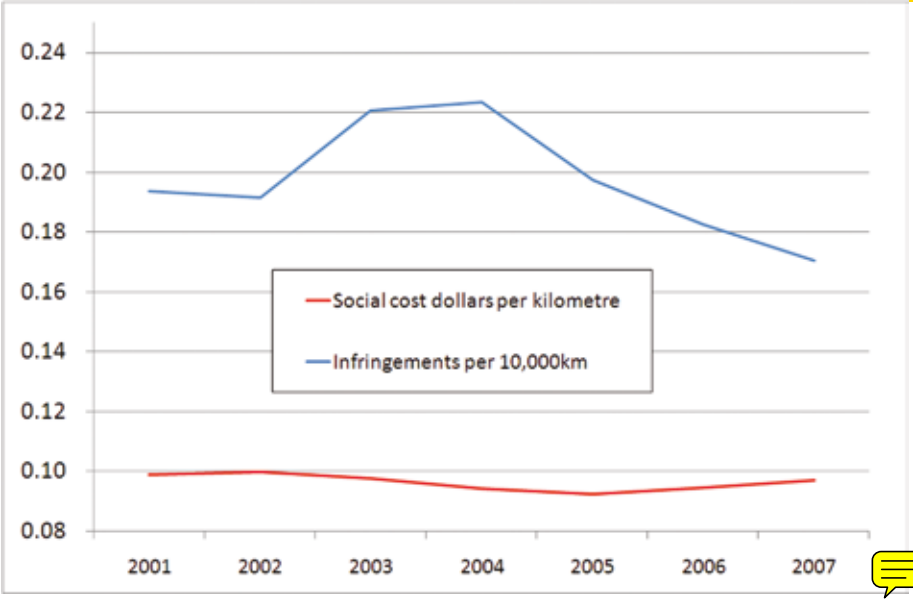
2.1 Focus on speed and alcohol does not correlate to injuries





While police tend to focus on criminal causes of crashes, ie speed, alcohol and non-compliance over restraints, the most significant cause of crashes recorded over the past eight years has been "poor observation" (ie distraction, as few people admit distracted driving to attending police). Even when scaled for the impact of the crash (social cost) poor observation remains the most significant cause of road-safety incidents. After poor observation comes poor handling and driving too fast for the conditions. As explained earlier this does not necessarily mean exceeding the speed limit. Thus the top three causes by social cost – poor observation, poor handling and driving too fast for the conditions – essentially come down to the poor driving-task and vehicle-management skills of New Zealand drivers.

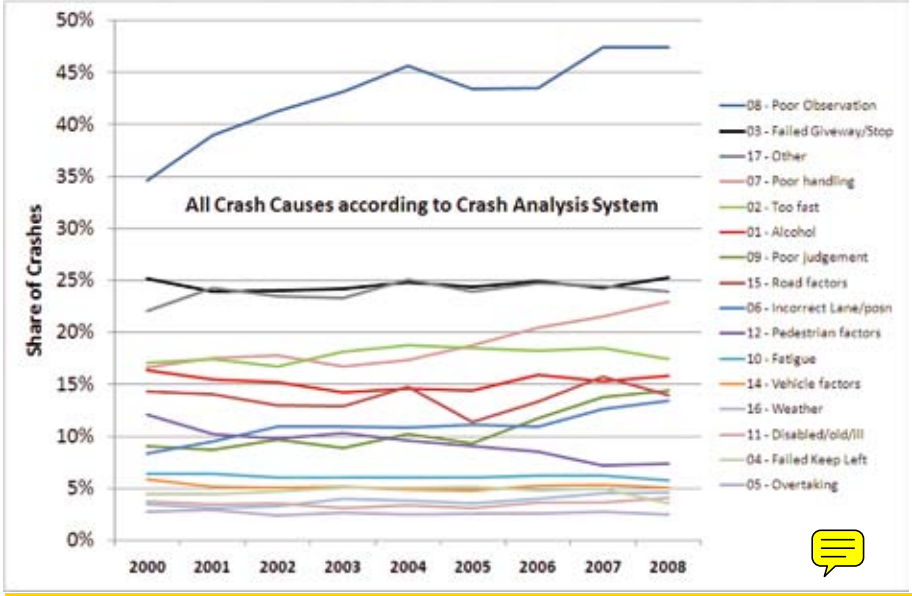
2.2 No relationship between infringements and injuries per kilometre travelled



From 2001 to 2007 the social cost per kilometre travelled averaged at 10 cents per kilometre.
The number of infringements issued by police has ranged from 694,000 to 874,000 and the rate of issuance per 10,000km travelled by New Zealanders has ranged from 0.17 to 0.22. The two are compared here although infringements are 10,000 times fewer per kilometre than social cost.

The correlation between the number of infringements issued per kilometre travelled by New Zealanders is scant (r^2=0.2). Increasing infringement issuance has little effect on injuries or social cost.

2.3 What really causes crashes ?



Crash causes coded in the Crash Analysis System are entered by Police from crash forms at the scene. Although the form makes ticking speed and alcohol easy, in fact the most commonly coded cause is "poor observation". Almost half of all injury crashes were coded to "poor observation" in 2008. In most cases police cannot infer that a driver was not looking where they were going before the crash because few drivers will admit this to a police officer. "Distraction" is therefore classed as a relatively minor cause (11%). There is, however, good reason to suspect that inattention, either through distraction, fatigue, or a combination of the two, is the leading cause of injury crashes.

2.4 Focus attention on inattention

Telling people to wake up and pay attention on the road while they are watching television is unlikely to be very effective at changing driving behaviour. While the intention is correct, the delivery mechanism is completely wrong. People don't intend to be inattentive. What they don't know is how they end up being inattentive. This is due to inadequate information on how to recognise situations where the risk of a crash or being hit as a pedestrian is higher because of inattention. Examples include distractions due to cell-phones, relationships, attention-seeking children, or lack of sleep.
It is probably asking too much to expect drivers to concentrate on driving all the time. Most drivers tend to concentrate on the purpose of driving rather than the driving itself because it has become, like walking, an automatic function. Constantly trying to gain drivers' special attention is neither desirable nor sustainable. But gaining extra concentration in risk areas is essential. Posting large orange signs is one approach. Another is more subtle. This involves working on the driver's visual field so their perception of safety is altered. This "self explaining road" approach has been tested by Waikato University and found to be highly effective.


Probable fatigue crash

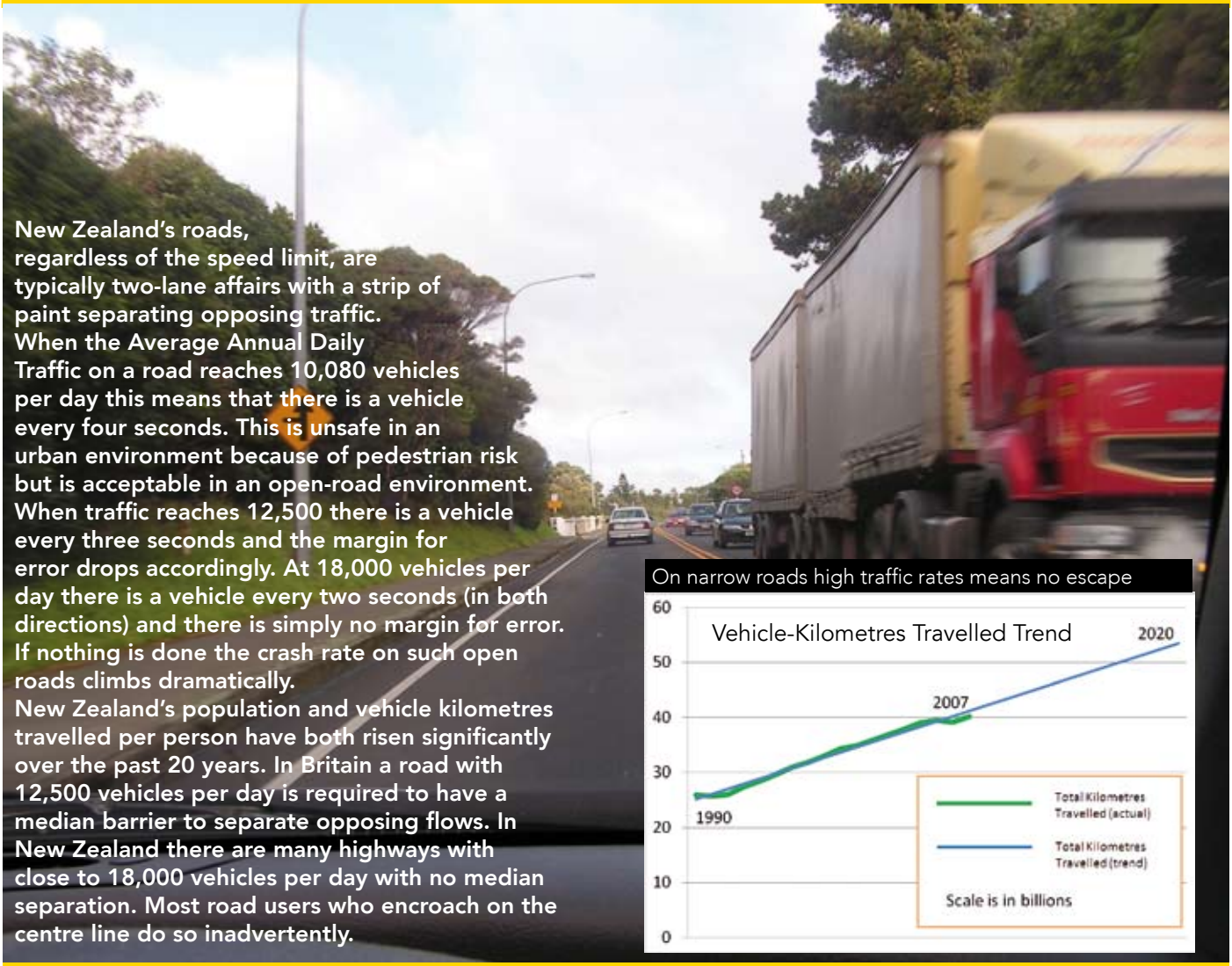
80% of crashes may involve driver inattention in some form. Are drivers getting a **useful** message ?


NZTA fatigue ad

Dr Tom Dingus, director of Virginia Tech Transportation Institute.
Driver inattention is the leading factor in most crashes and near-crashes, according to a landmark research report released in 2006 by the National Highway Traffic Safety Administration (NHTSA) and the Virginia Tech Transportation Institute (VTTI).
Nearly 80 percent of crashes and 65 percent of near-crashes involved some form of driver inattention within three seconds of the event. Primary causes of driver inattention are distracting activities, such as cell-phone use, and drowsiness.
The 100-Car Naturalistic Driving Study tracked the behavior of the drivers of 100 vehicles equipped with video and sensor devices for more than one year. During that time, the vehicles were driven nearly 2,000,000 miles, yielding 42,300 hours of data. The 241 drivers of the vehicles were involved in 82 crashes, 761 near-crashes, and 8,295 critical incidents.

The Automobile Association believes that New Zealand needs to urgently replicate the VTTI's 100-car naturalistic driving study in New Zealand to supplement data gained from crash reports and understand the true cause of New Zealand crashes.

3.0 Roads and margin for safety

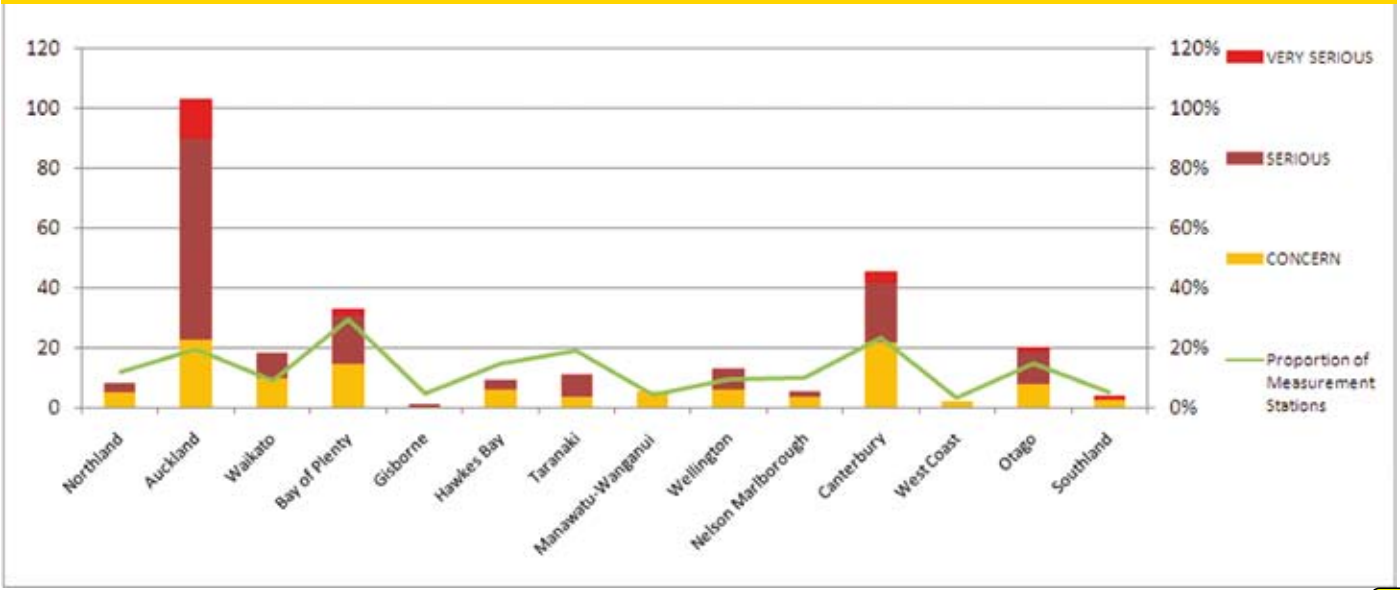


New Zealand's roads, regardless of the speed limit, are typically two-lane affairs with a strip of paint separating opposing traffic. When the Average Annual Daily Traffic on a road reaches 10,080 vehicles per day this means that there is a vehicle every four seconds. This is unsafe in an urban environment because of pedestrian risk but is acceptable in an open-road environment. When traffic reaches 12,500 there is a vehicle every three seconds and the margin for error drops accordingly. At 18,000 vehicles per day there is a vehicle every two seconds (in both directions) and there is simply no margin for error. If nothing is done the crash rate on such open roads climbs dramatically.

New Zealand's population and vehicle kilometres travelled per person have both risen significantly over the past 20 years. In Britain a road with 12,500 vehicles per day is required to have a median barrier to separate opposing flows. In New Zealand there are many highways with close to 18,000 vehicles per day with no median separation. Most road users who encroach on the centre line do so inadvertently.

On narrow roads high traffic rates means no escape

3.1 Unsafe state-highway traffic growth



The State Highway network's traffic volumes are monitored by a series of measurement sites. The annual average growth rate of those sites over the past nine years was applied to the next ten years to 2018. The traffic volume was classified according to the estimated number of vehicles per second the roads carried. Where a measurement site increased to a vehicle every three seconds (around 12,500 per day) from a previous low level it was rated as "concern". If the measurement site increased to a vehicle every two seconds (18,000) or more from lower rate it was rated "serious". If the increase was from a vehicle every four seconds to one every two seconds or more during the ten year period it was rated "very serious". The left axis shows the number of sites, the right axis the percentage of all sites in that region. It is somewhat alarming that a fifth of sites in some regions rate "concern" or worse.

3.2 Where the costs of road trauma fall

Northland
3.6% of the population but 6.8% of the social cost of crashes. Cost divided equally between state highways and local government roads.

Auckland
33% of the population but 17.7% of the social cost of crashes. Cost divided 3.9% state highways and 13.8% local government roads.

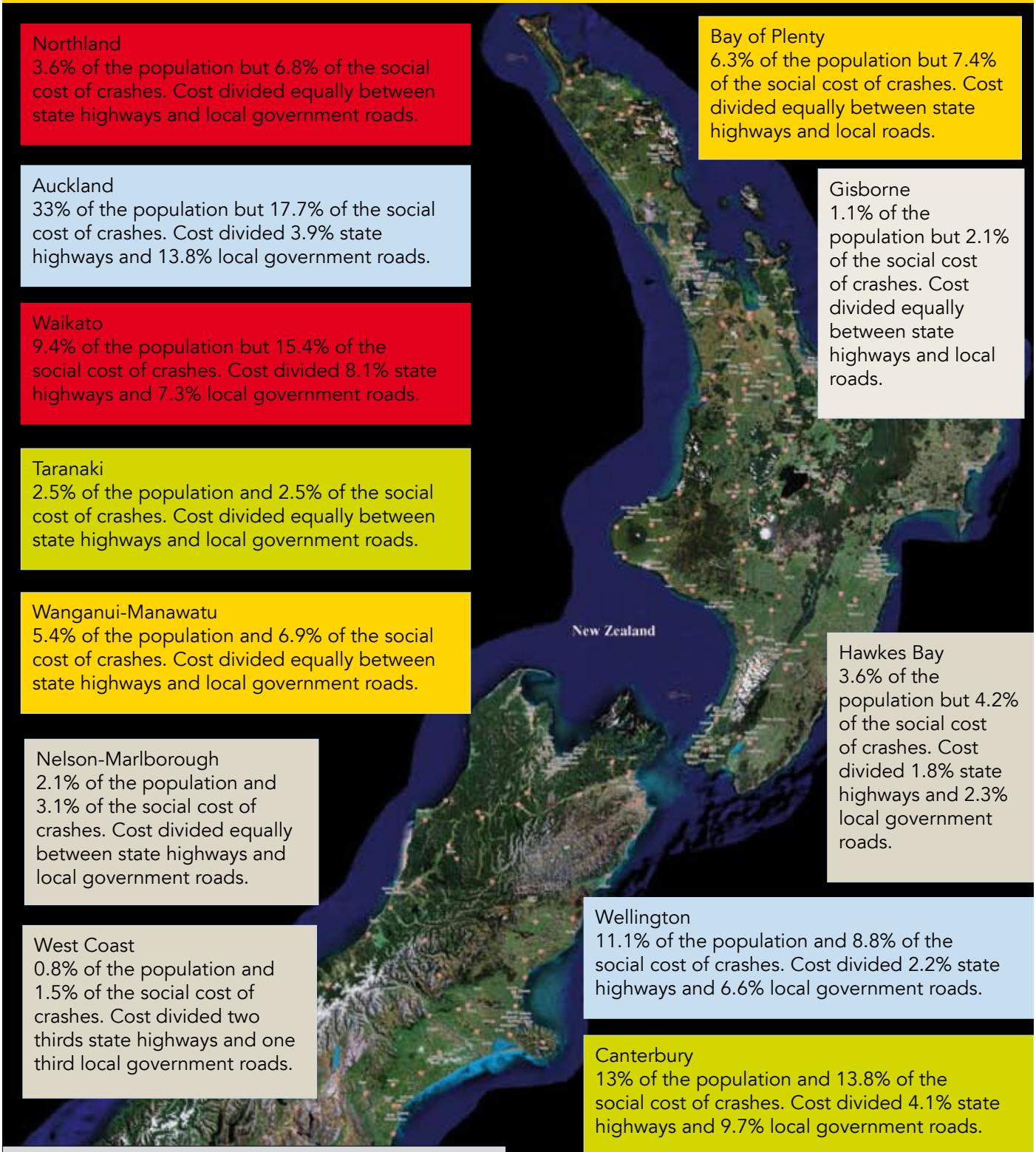
Waikato
9.4% of the population but 15.4% of the social cost of crashes. Cost divided 8.1% state highways and 7.3% local government roads.

Taranaki
2.5% of the population and 2.5% of the social cost of crashes. Cost divided equally between state highways and local government roads.

Wanganui-Manawatu
5.4% of the population and 6.9% of the social cost of crashes. Cost divided equally between state highways and local government roads.

Nelson-Marlborough
2.1% of the population and 3.1% of the social cost of crashes. Cost divided equally between state highways and local government roads.

West Coast
0.8% of the population and 1.5% of the social cost of crashes. Cost divided two thirds state highways and one third local government roads.



Bay of Plenty
6.3% of the population but 7.4% of the social cost of crashes. Cost divided equally between state highways and local roads.

Gisborne
1.1% of the population but 2.1% of the social cost of crashes. Cost divided equally between state highways and local roads.

Hawkes Bay
3.6% of the population but 4.2% of the social cost of crashes. Cost divided 1.8% state highways and 2.3% local government roads.

Wellington
11.1% of the population and 8.8% of the social cost of crashes. Cost divided 2.2% state highways and 6.6% local government roads.

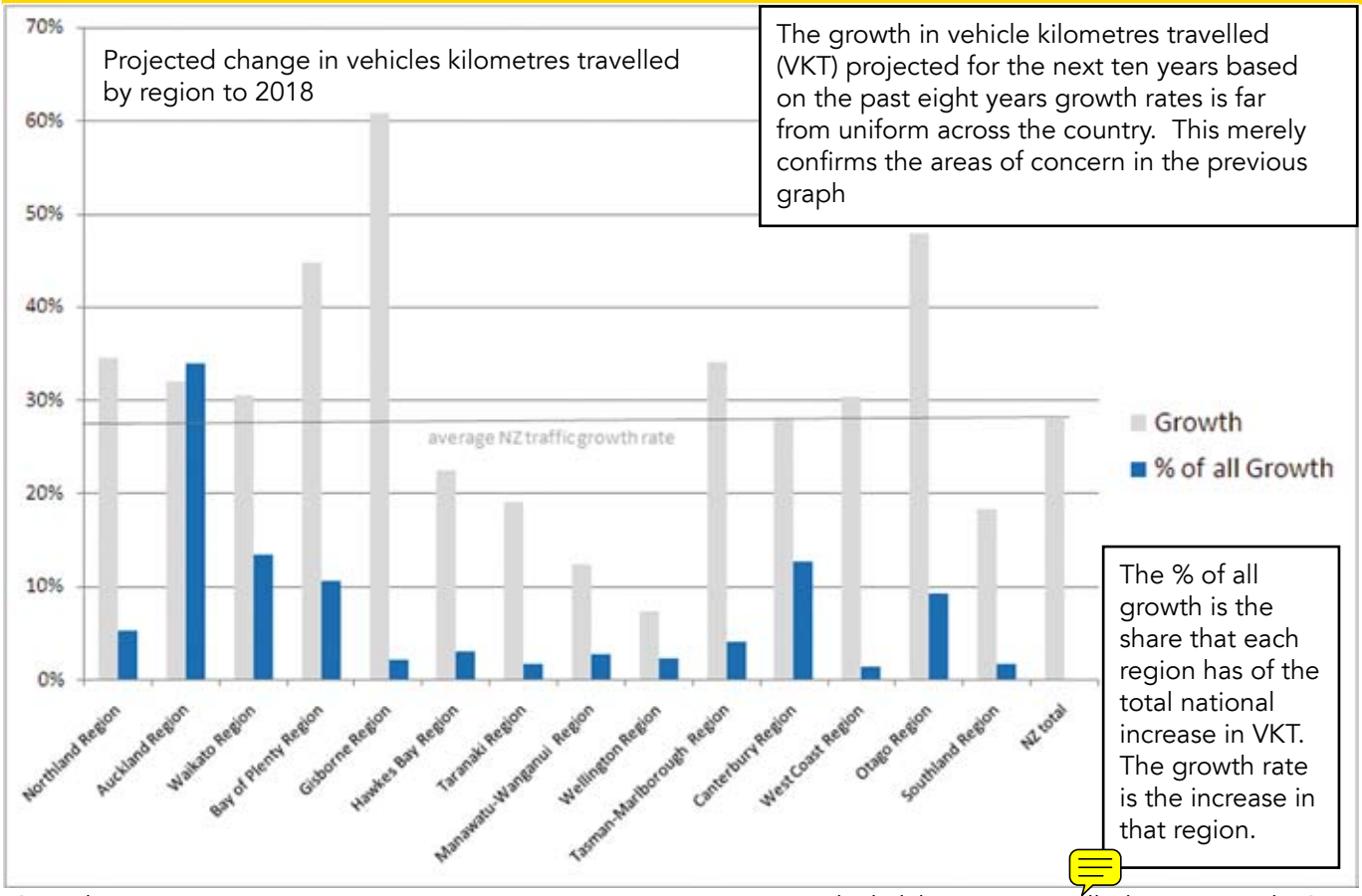
Canterbury
13% of the population and 13.8% of the social cost of crashes. Cost divided 4.1% state highways and 9.7% local government roads.

Otago
4.8% of the population and 6.4% of the social cost of crashes. Cost divided 2.3% state highways and 4.2% local government roads.

Southland
2.2% of the population and 3.2% of the social cost of crashes. Cost divided equally between state highways and local government roads.

Conclusions
Northland and Waikato are seriously over-represented by crash social cost, while Bay of Plenty, Hawke's Bay, Wanganui-Manawatu and Otago are worrying. Only the main cities are notably under-represented.Yet Auckland, Canterbury, Wellington and Waikato local roads account for 36% of annual crash social cost. Most of these crashes involve giveways.
Over the years the state-highway share of social cost has been gradually falling while local government's has been rising. Local government accountability has been raised by strategy reviewers (eg Breen). As yet nothing has been proposed to address this.

3.3 Traffic factors



The growth in vehicle kilometres travelled (VKT) projected for the next ten years based on the past eight years growth rates is far from uniform across the country. This merely confirms the areas of concern in the previous graph

The % of all growth is the share that each region has of the total national increase in VKT. The growth rate is the increase in that region.

Over the next ten years we can expect to see a quarter again more vehicle kilometres travelled on our roads. Since the rate of injury per VKT has been getting worse since 2000 this strongly suggests that the injury rate will continue to grow as roads become more intensively used. This growth will be most apparent in Auckland, Bay of Plenty and Waikato as well as Canterbury and Otago. In these regions in particular roads may well need upgrading. That said, there may well be specific roads which are simply not safe in other areas.

We may need to face the unpleasant possibility that New Zealand's population has now outgrown a land-transport system largely developed 40 years ago, when our population was a third (1,500,000 people) smaller and traffic densities far lower.

3.4 Open-road issues

New Zealand has the third-shortest motorway network in the OECD. Motorways are divided carriageways, which are significantly safer than any other type of road. New Zealand's Average Annual Daily Traffic threshold for making a route into a motorway is considerably higher than in many comparable nations. The cost of construction is unusually high in New Zealand.

Most of New Zealand's open roads are one lane with a 100km/h speed limit. Half of New Zealand's vehicle kilometres travelled take place on such roads. A sixth of all injury crashes occur on rural road corners. While most of these roads are adequate, provision of extra passing lanes was found to have very high benefit-cost ratios when examined from a national view.

New Zealand still has 33,000 kilometres of unsealed roads from of a total of 93,000. Typically these roads have a traffic rate of one vehicle every three minutes or less. While these roads may appear unsafe the converse appears to be true. Land Transport Research Report 314 could find no safety benefit from sealing unsealed roads.

3.5 Open road responses

According to TERNZ edgelining (rumblestrips) the state highway network has an economical benefit-cost-ratios (over 4) for over 70% of the State Highway network. TERNZ estimated that edgelining in New Zealand would achieve similar crash savings as the United States. The rule-of-thumb value there is 25%. The precautionary principle suggests more edgelining should be used.

Where roads carry more than a vehicle every three seconds (12,500 vpd) opposing traffic streams need to be separated. Wire-rope medians cost relatively little money and can withstand a glancing blow from a heavy truck. Monash University Accident Research Centre has found no special hazard to motorcyclists compared to other or no medians.

While roadside treatment of the entire State Highway network may be impractical and expensive, crash statistics show 15% of all injury crashes occur on bends. Improving safety margins on bends by improving signage, skid resistance, and cambers, while widening roads, covering ditches and removing hard obstacles would have a significant effect on safety.

3.6 Urban road issues

Urban arterials are set to experience the most growth. Achieving greater efficiency will be essential. One-way systems already operate well in Wellington and Christchurch but are scant in Auckland. Moving all traffic in a single direction reduces the risk of head-on collisions or pedestrian error.

Urban collectors will also see increased traffic growth. These busy streets combine parking, pedestrian and cycling hazards. The increased complexity will disadvantage both young and old road users. Separating vulnerable users on to their own routes will improve safety and flow.

Suburban streets' traffic growth will grow the slowest. These streets respond to demographic change such as household composition changes, so too do traffic types. By introducing slow zones local authorities can provide alternative routes for vulnerable road users.

3.7 Urban road responses

Failure to give way is the leading cause of urban crashes. Despite more than enough evidence successive Governments have continued to dodge the percieved political problem of changing our unique right-hand rule. Unless our political system can make such changes our chances of improving road safety are limited.

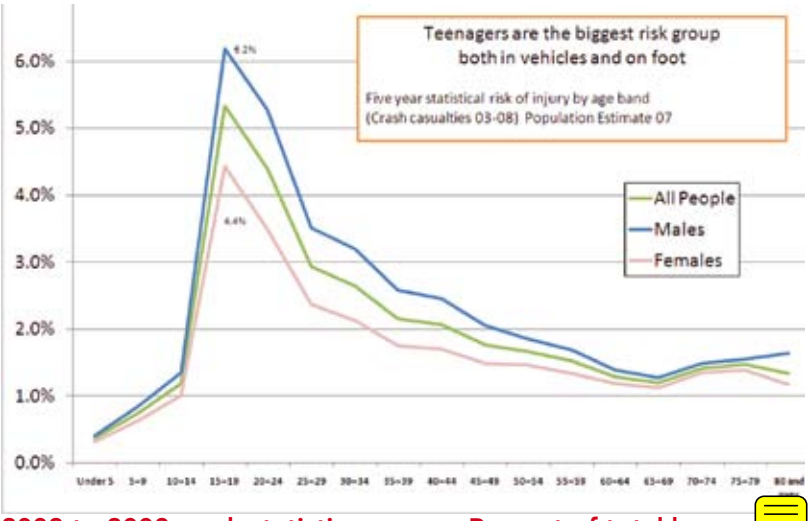
Managing speeds in suburban streets through physical changes to street layout rather than simply posting limits encourages use of the street space which is largely unused most of the day.
This should not be applied to highly trafficked roads but can provide alternate routes for other modes.

Government has been very coy about surveillance technology but AA Members support the use of cameras for enforcement.
Not only can cameras be used for enforcement, but they can also be used for route management and improving public safety confidence for using public transport.

Variable message signs on school buses and near schools in particular are far preferable to changing enforcement tolerances. Other uses can be for managing events, or managing speed in areas where drivers don't check their speedometers.
Permanent variable message signs linked into a street management network can also provide for route management.

4.0 Human factors - Youth

There are significant time-of-life risks associated with road safety. Some of these relate to violating rules but others are simply about fragility. This is particularly true of very young and very old people. Teens are a special case.



2003 to 2008 crash statistics. **Percent of total by age**

Car casualties	Age	Pop	Fatal	Serious	Minor
Baby on board	0-4	7%	2%	1%	1%
Kids in cars	5-9	7%	2%	1%	2%
Tweens in cars	10-14	8%	2%	2%	3%
Teens in cars	15-19	7%	18%	21%	21%
Young adults in cars	20-29	13%	22%	26%	25%
Adults in cars	30-49	29%	26%	28%	29%
Mature Adults in cars	50-64	17%	13%	12%	11%
Retired in cars	65 +	12%	16%	9%	8%
		100%	100%	100%	100%

Pedestrian Casualties	Age	Pop	Fatal	Serious	Minor
Preschool on foot	0-4	7%	8%	5%	6%
Kids walking	5-9	7%	6%	11%	14%
Tweens on foot	10-14	8%	5%	11%	15%
Teens on foot	15-19	7%	11%	13%	14%
Young adults on foot	20-29	13%	11%	14%	15%
Adults on foot	30-49	29%	28%	18%	17%
Mature Adults on foot	50-64	17%	6%	12%	8%
Retired on foot	65 +	12%	24%	17%	11%
		100%	100%	100%	100%

Teaching teenagers

Teenagers are effectively children making the transition to adulthood. The frontal lobes of their brains which handle risk assessment will not fully mature until they are 26.

The probability of a male being injured on the roads over the years he is 15,16,17,18 or 19 is 6.2%. The probability of a female being injured during these years is 4.4%. The rate for mature adults is 2%.

Teenagers are not only the greatest risk group in cars, they are also the greatest risk group on foot.

The social cost of teenage crash victims accumulated over five years (2003-2008) is a fifth of the total cost for *all* New Zealanders over the same period despite being only 7% of the population.

Teens are largely fixated on their peers. They communicate via networks and largely exclude "uncool" influences. Teen crash survivors and popular entertainers may make the best road safety ambassadors.

Porirua College implemented an innovative driver-education programme when it was discovered many students were driving without a licence.

At any one time there are 300,000 permanent New Zealand residents between 15 and 19 in New Zealand.
Of these 200,000 will have a learners, restricted or full licence and 150,000 will be enrolled in secondary school.

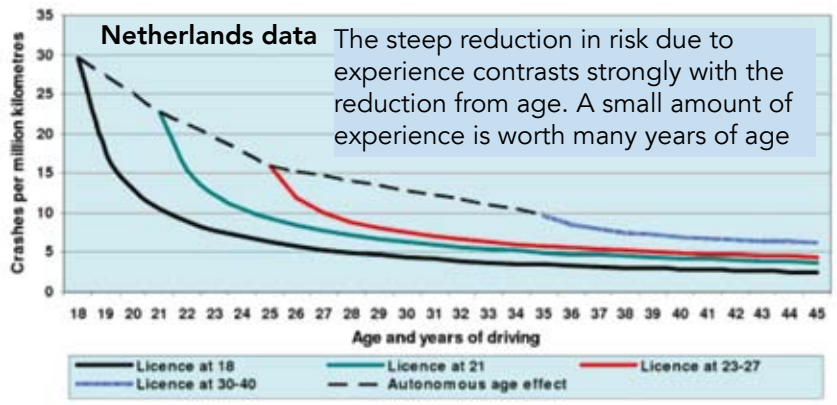
Almost 100% of the 65,000 15 year olds will be enrolled at secondary school. However, by age 17 the rate drops to 75% for Europeans and 60% for Maori.

It is perplexing that the secondary health curriculum addresses the 50 15-19-years-olds who commit suicide each year while ignoring the 93 15-19-year-olds killed on the road.

Education

There is a long-standing myth in New Zealand road-safety circles that education does not reduce teen crash rates. This is based on US experience. In the 1970s many US States offered a programme whereby teen drivers could get their licences at a younger age if they completed 30 hours of classroom driving instruction and eight hours practical. As the graph on the following page (p11) shows this was not nearly enough to counter-act the age effect. What is actually required is education along the lines advanced by Gregersen. Integration of parents into the task is also important. For disadvantaged groups assisted access to driver training is preferable to unlicensed driving.

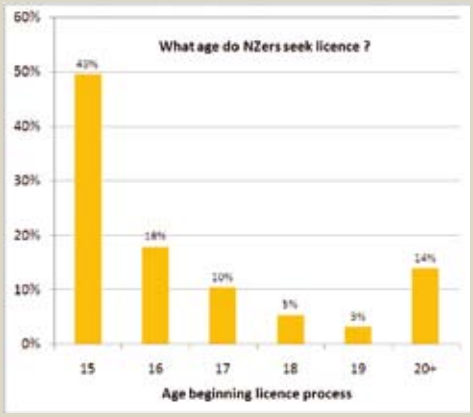
4.1 Human factors - Youth supervision



Source: Vlakveld, 2004

Comparable New Zealand data is not available

New Zealand's problem is not young drivers. It is young *unsupervised* drivers. The more experience a driver gets through their lives the safer they are. All novice drivers under adult supervision are safer than adult drivers. New Zealand's problem is we expect after six months of vague practice to have competent drivers. Internationally the minimum recommended time is 120 hours. That's up to two years of supervision!

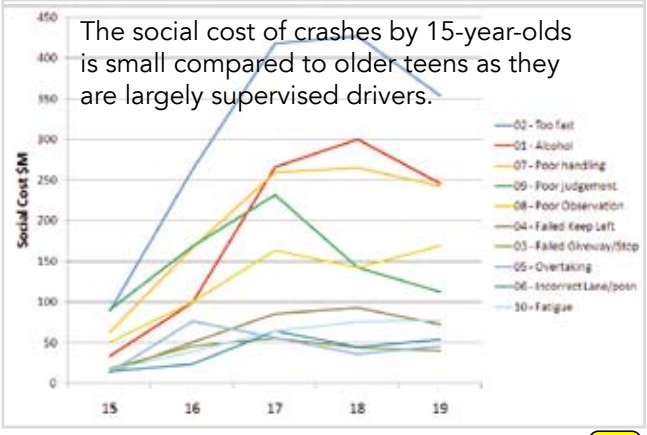


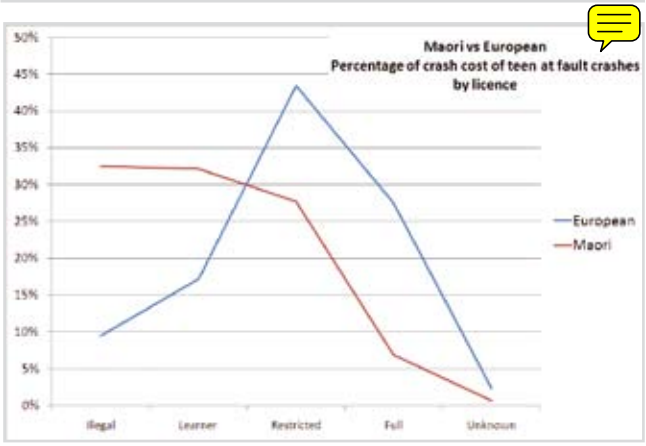
The AA assisted Otago University to find a cohort of representative young drivers. Half are aged 15.
There is nothing wrong with starting to learn young. Increasing the start-age simply reduces the liklihood of adult supervision or parental assistance for professional instruction.

Some young people enjoy baiting Police. Police Operation Sniper in Manukau has shown how the boy racer problem can be managed undramatically.

The profile of risk-factors for teen drivers is significantly different from that of the rest of the population. Where poor observation is the risk-factor associated with the overall majority of crashes, for teens the main ones are speed and alcohol. These crashes occur at night by a ratio of four to one for alcohol-related crashes while speed-related crashes occur by day and night equally.

When examined by licence the European segment of the population (around 70%) reinforces the view that those on restricted licences are at the greatest crash risk. The Maori result is, however, very different. For Maori 32% of the social cost caused by teens is by drivers without a proper licence. This compares to 9% for Europeans. As Maori are 18% of this population (and growing) this lack of compliance with basic licensing is concerning.



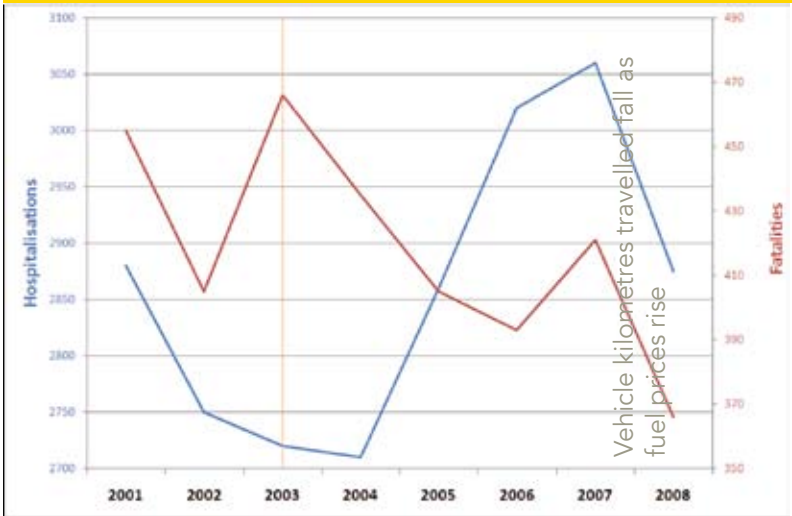


Nils Petter Gregersen
National föreningen för trafiksäkerhetens främjande, Sweden.

One of the leading experts on youth driving-safety and responsible for reducing Sweden's practice age from 17.5 to 16. His contention is that driver education on road rules and vehicle handling is not as important as education about risk factors, managing social situations and all the precursors to dangerous driving.

"Road safety education should be an integral part of ordinary teaching and should give pupils a good foundation for their role as adult citizens and road users."

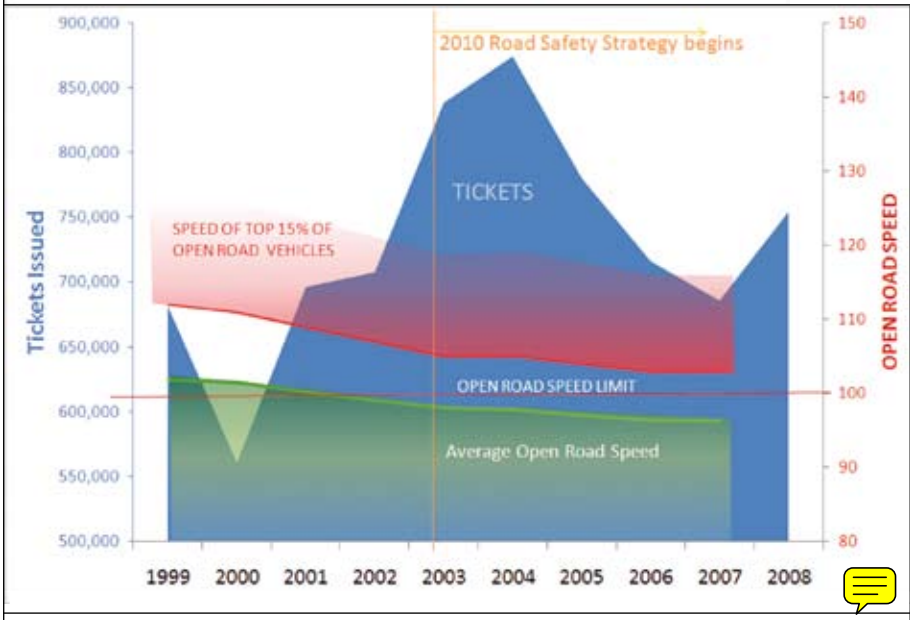
5.0 Human factors - Speed enforcement



The rates of fatality and hospitalisation on our roads are not particularly well related. While there has been a slight downward trend in fatality hospitalisation rates have increased significantly.

In the formation of the 2010 Road Safety Strategy it was assumed that a "*1% decrease in mean speeds in urban areas will result in an 8% reduction in deaths and a 1km/h reduction in open-road mean speeds will result in a 4% decrease in deaths*". Since 2000 there has been a 3km/h reduction in urban speeds and 4km/hr reduction in mean open-road speeds. There has not been a 40% reduction in deaths.

While average speed-reduction targets have been consistently achieved the expected reductions in injury have not eventuated.



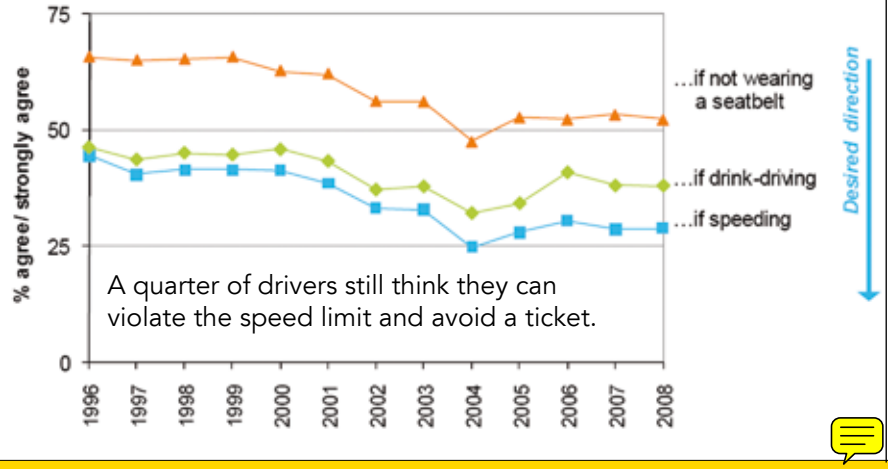
Average open-road speeds have dropped below the open-road speed limit since 2003. While the top 15% of speeders are still marginally over the speed limit, their average speed has dropped from 112 to 103 km/h.

At the same time the number of tickets issued by Police has peaked at 850,000 and dropped to 700,000.

Plotting the rate of change of Police ticket-issuance against the rate of change of speed lagged by a year (for one to affect the other) which shows that the two are independent.

There is also no sign of a correlation between the decline in open-road speed and a decline in injuries (because injuries increased).

Figure 2: People who agreed that the risk of being caught is small when… (decreasing is good)



The MOT Public Attitudes survey shows that the public's views on the chances of being caught while speeding do indeed correspond to the 2004 peak in Police ticket-issuance. They then rebound, possibly because of the fall off in enforcement.

However, the open-road mean and 85th percentile values continue declining anyway. This strongly suggests that the open-road speed is being influenced by another factor (possibly fuel consumption concerns).

In other words, open-road speeds are not solely governed by the level of enforcement by Police.

While Police ticket-issuance peaked at the equivalent of 27% of the population (over 15 years) in 2004, the subsequent reduction in speed-enforcement has not altered the gradual decline in open-road speeds. Speeds have reduced *anyway*. Despite the decline in open-road average speeds injury rates have not reduced, but in fact, have climbed.

From an injury-prevention perspective, simply increasing the number of speed-limit signs and attempting to control speed by ticketing is absurd. The only sustainable injury prevention strategy are treatments that directly affect drivers' behaviour.

5.1 Human factors - Speed self management

Signs don't work

The crime-prevention outlook for speed management is simple. You change a sign. Research ((Johansson & Backlund) has found that 1 in 4 drivers in a traffic stream will **not** notice a speed-limit sign. That is poor performance from an injury-prevention point of view and poor definition of criminal behaviour.

But half of the crashes where speed "too fast for the conditions" is a contributing factor occur on curves. Drivers may be under the speed limit but still going too fast for the conditions. Research (Charlton & Baas) has found that on average only one in eight responds to advisory speeds.

Who is driving ?

Speed limits are limits on **maximum** speeds. They are not **target** speeds, nor are they even **safe** speeds.
The sign to the left might also include limits for bad weather, ice, towing, or any combination.
As soon as the State starts advising drivers what a safe speed for the conditions is, it takes some of the responsibility for driving from the driver.
Drivers must be told speed limits are not guarantees of safety.

Self-explaining-roads


Herringbone pattern in simulator

The safest speed and course for a road should be inherently obvious. The whole environment should provide clues as to what sort of speed is appropriate for the conditions. Moreover, sub-conscious cues are harder for those who tend to violate limits either in defiance of enforcement or through overconfidence.
The object of self-explaining roads is to reduce confidence, and hence speeds, subconsciously.

Actual scene

Speed limits can be counter productive. The specified speed limit implies an endorsement by authorities of driving up to a specific speed. The limited speed zone sign on the right means the same limit but does not provide a target speed.

If speed limits are not targets why do they look like them?


Retouched scene

Dr Sam Charlton
Waikato University Traffic and Road Safety Group
In *Influencing Driver Behaviour Through Roadmarking* Dr Charlton shows that changing the roadmarking around curves and bends could have a significant effect on drivers' responses to handling those curves. As 15% of all injury crashes occur on bends on open roads this research is of vital significance to reducing crashes usually coded as "too fast for the conditions".
Dr Charlton is also working on urban speed-calming techniques, which reduce the tempo of traffic by using perception techniques. The result is that speeds are reduced whether Police are in evidence or not.

6.0 Human factors - Maori

Maori attitudes to road safety enforcement are significantly different to New Zealand European ones

- More likely to be stopped for other traffic offences (not drink-driving or speeding)
- Find it more difficult to go easy when drinking with friends
- Less likely to believe compulsory breath-testing helps lower the road toll
- More likely to enjoy driving fast on open road
- More likely to believe there is not much chance of accident when speeding if careful
- More likely to believe risk of being caught speeding is small
- Less likely to believe enforcing the speed limit helps to lower the road toll
- Less likely to believe enforcing the use of seatbelts helps lower the road toll
- Less likely to believe in effectiveness of seatbelts for reducing the road toll
- Less likely to wear a seatbelt when travelling around town as a passenger in a private car.

source: MoT *Public Attitudes to Road Safety Survey 2008*

Maori

In 1998 a Police commissioned study stated that Maori "*participants were unanimous in their perception that the police institution is a racist institution that perpetuates strong anti-Maori attitudes.*"No follow up study has been published to indicate this has changed in the past decade.

There can be no doubt that Police must continue to enforce the law regardless of ethnicity; however the residual antagonism between Police and some Maori in general suggests that some Maori see enforcement as a mechanism to hassle them because they are Maori, not because of what they are doing.

That said, the Crash Analysis System shows that Maori are disproportately likely to be involved in crashes involving alcohol or driving too fast for the conditions.

All of this strongly suggests that road-safety messages have been confused by the presence of the road-safety messenger (Police). Ultimately Maori have to be convinced that road safety is in their own best interests regardless of enforcement.

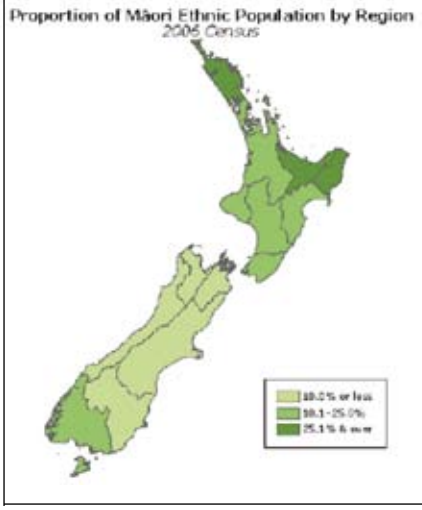
2003-2008 CAS DATA

Maori are 15% of the population but are more than double in crashes.

Ratio of Maori Crash Causes to non-Maori Crash Causes

	2003	2004	2005	2006	2007	2008
All Cause Cats						
100 - Alcohol or Drugs	37%	37%	39%	42%	41%	42%
110 - Too fast for Conditions	28%	25%	35%	35%	34%	32%

The values show the proportion of crashes where Maori have been identified as drivers in these forms of crash (though not necessarily those causing the crash).



Maori figure disproportionately in statistics relating to imprisonment, poor mental health, poor educational outcomes and poverty in general. All of these factors, combined with the fact that Maori populations concentrate where our roads require greater investment, predict that Maori can be expected to figure disproportionately in road-safety trauma statistics.

There are, however, a number of common factors worth highlighting. The first and most important is alcohol and drugs. Maori problems with these things go beyond road safety, but they are very important to road safety. It should be obvious that prosecution is simply part of a vicious cycle.

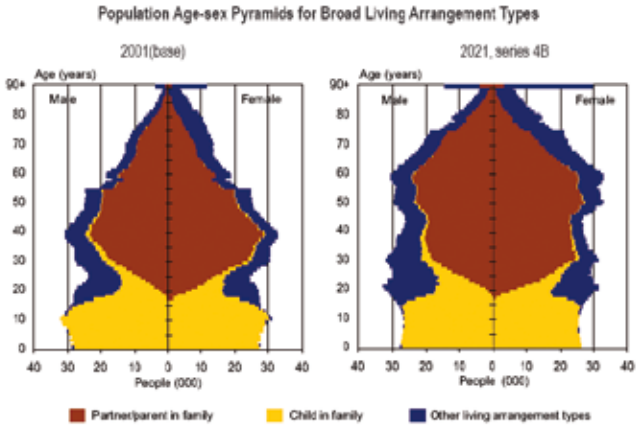
Another factor is the absence of Maori road-safety champions. Road safety is not beyond anyone if they are prepared to own the issue. Currently Police own the issue and this may alienate some Maori. Police are making efforts to improve relations, but Maori need more Maori road-safety champions.

7.0 Human factors - Age

One of the most problematic aspects of road safety for older New Zealanders is the rapid economic growth in many popular retirement areas such as Tauranga, the Waikato, Auckland, Canterbury, and Nelson

Mobility for older people is essential for their mental health and well-being

Older, frailer drivers and pedestrians

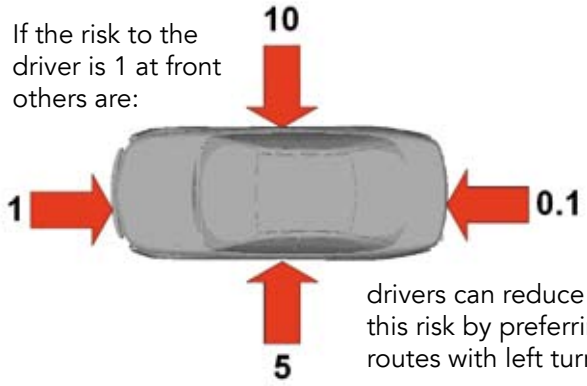


New Zealand's population is projected to age with an increasing proportion of "empty-nester" families toward 2021. Older people living longer will still want to enjoy the benefits of automobility but will be at greater risk because of increasing frailty and health-related issues. While this is a relatively minor issue now, it can be expected to become more and more significant over time.

source: Dr Laurie Sparkes, retired chief engineer Holden Innovation

Driver injury risk by collision incidence

If the risk to the driver is 1 at front others are:

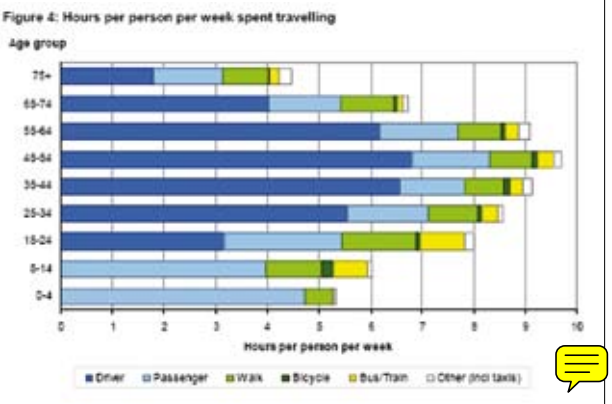


drivers can reduce this risk by preferring routes with left turns

The simple fact is that older people have more side-impact crashes. Unfortunately while vehicle manufacturers have dramatically improved the frontal crash-worthiness of vehicles, and are experimenting with collision-avoidance systems, the simple geometry of vehicles makes it impossible to provide any more protection from side impacts. The risk is therefore that side (intersection) impacts will increase, as will their severity.

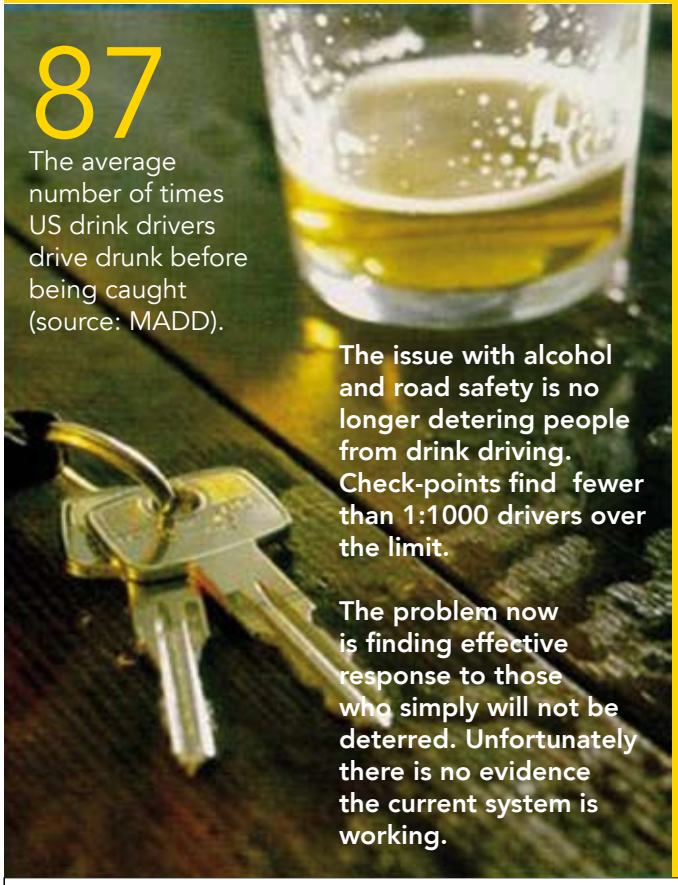
Older drivers succumb to fatigue toward the middle of the day on longer trips. They also have higher crash rates at intersections. Although fewer drive at night, night-vision degeneration means that eyesight becomes an issue.

Older pedestrians are over-represented among fatalities. In most fatal crashes older pedestrians seem to simply ignore hazards in the assumption that traffic will wait. This appears to apply whether on foot or scooter.



Older people drive less and walk more than younger people. Whether this trend will persist is unclear as women who have always driven enter old age and replace women who never have.

8.0 Human factors - Alcohol



87

The average number of times US drink drivers drive drunk before being caught (source: MADD).

The issue with alcohol and road safety is no longer detering people from drink driving. Check-points find fewer than 1:1000 drivers over the limit.

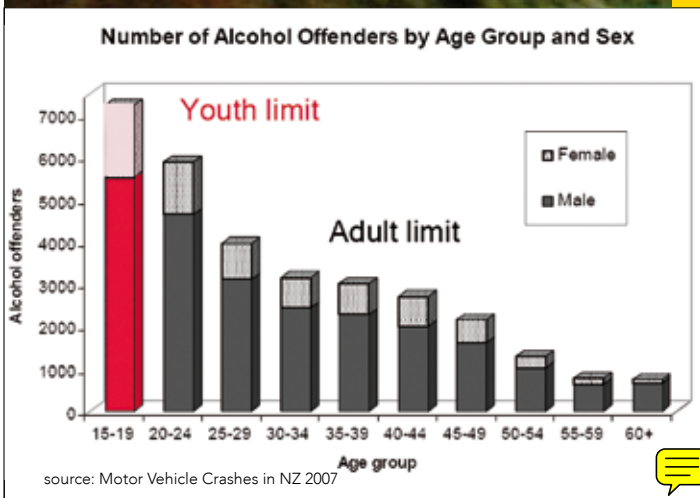
The problem now is finding effective response to those who simply will not be deterred. Unfortunately there is no evidence the current system is working.

Criminal Drinking

Excessive alcohol consumption is strongly linked to many forms of violent crime including driver and pedestrian injuries and fatalities. In most cases those involved are very drunk indeed. Many habitually so.

AA Membership Surveys have generally found that AA Members are strongly supportive of police actions to reduce the incidence of intoxicated driving. Members support the impoundment of vehicles driven by any person found to have 100mg/100ml of blood alcohol (currently 130mg/100ml) They also strongly support increased penalties for hard core drunk drivers over 160mg/100ml and increasing the maximum penalties for causing death or injury while driving drunk.

The MoT Public Attitudes to Road Safety Survey has found 52% support for reducing the blood-alcohol limit. While support is stronger in urban middle class areas it is weaker elsewhere.This could make change politically difficult. The incidence of measured BACs between 50-80mg/100ml in fatally injured drivers is 1:30. By contrast, 40:60 fatally injured drivers were over double the limit in 2007.The MoT has speculated that unmeasured values may be different but speculation should not form the basis of policy. The AA supports a review of the 80mg/100ml limit and penalties for higher intoxication levels.



source: Motor Vehicle Crashes in NZ 2007

Of those convicted of drink-driving offences a great many infringe on the 30mg/100ml Youth limit. The youth limit reflects the fact that under-20s start with a crash-risk equivalent to a slightly intoxicated adult.

One of the problems with this age group, however, is its childlike inability to plan for the future. The notion that a drink-drive conviction – even at 30mg – is something that will dog someone throughout their lives has not been well explained.

There is unfortunately no evidence that increased prosecutions in this group have had any effect in reducing the incidence. Indeed, in recent years it has *increased*.

Catching offenders is not the issue. The issue is preventing them offending or re-offending.

Increased access to alcohol has certainly increased the incidence of binge-drinking by young people. **The rate of alcohol injury for those 15 and 16 is far less than those aged closer to the legal drinking age.**

Alcolocks on cars are an effective response to recidivists. Unfortunately the high cost of alcolocks and the low cost of cars will make this response ineffective for poorer people with problems.

New Zealand lacks an alcohol treatment detention centre. This approach has been used in Sweden as an alternative to prison. Drivers with a BAC over 100mg/100ml need alcohol dependency assessment.

Many of those who offend against drink-driving laws were already offending against driver-licensing laws before they drank. More attention to licences would be useful.

9.0 All factors - Interactions between driver, road and vehicle

The cost of road injury is composed of a series of factors. Many of these are driving factors, some are vehicle factors and the remainder are environmental factors. There are also interactions: driving factors in the context of vehicle and environmental factors, or driving factors in the context of vehicle OR environmental factors.

For example a driver may need to brake but not know how to engage ABS braking systems properly. This is a failure of driver-vehicle interaction.

Another example, is a driver who may not recognise roadside hazards that require a change of driving style. This is failure of driver-environment interaction.

A final example is a driver failing to recognise ice and not knowing how to drive on it with ESC operating. This is failure of driver-vehicle-environment interaction.

The assumption under a crime model of road safety is that fair warning is all that is needed. Failure is fair ground for prosecution. Moreover, as this model is highly legalistic it takes the view that any transfer of responsibility away from the driver must lead to the unwanted outcome of diminished culpability.

However, under an injury-prevention model failure is a chain of consequences where interventions along the chain can reduce injury severity.

Under a Crime Model

- What drivers don't know is *their* problem once they past a test of minimum competency
- The vehicle must meet minimum standards of safety compliance
- Road controlling authorities must provide fair warning

Under an Injury Prevention Model

- What drivers don't know is *everyone's* problem all the time
- Drivers should know how to extract maximum road safety from their vehicle in any conditions
- Road controlling authorities should reduce injury consequences for all road users

What they don't know *can* and does hurt them


Hidden ditches


Banks and water


Avenue of trees

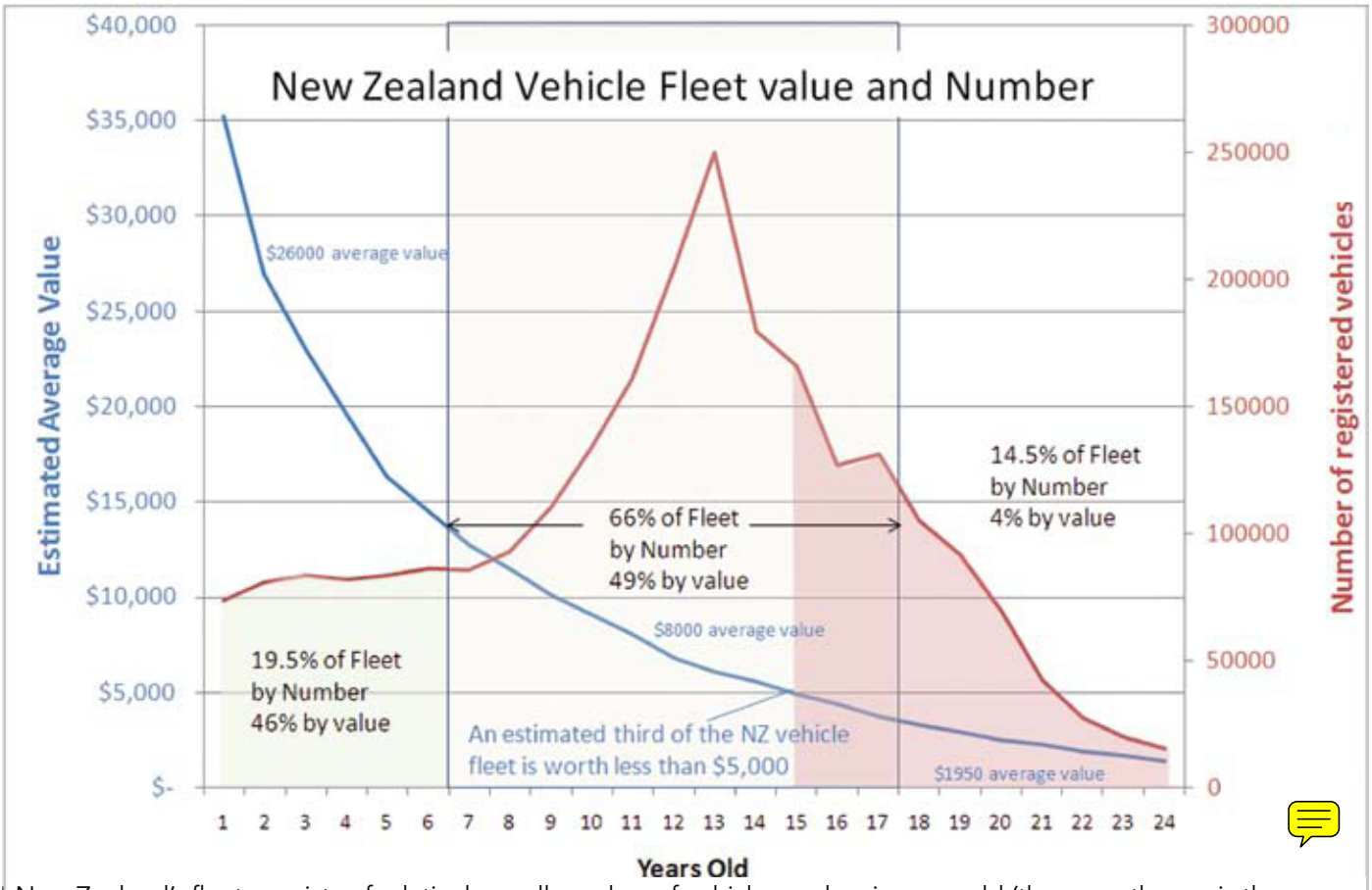

Poles and ditches

Not driving to the conditions is a significant cause of road crashes and the injuries that result. The problem is that New Zealand drivers do not appear to know what makes one road safer than another. An AA survey carried out for the Ministry of Transport as part of the KiwiRAP project, which seeks to produce star-ratings for roads, found that AA Members could identify an obviously unsafe road and an obviously safe road but could not identify hidden dangers such as those present in the pictures above. As correcting every roadside hazard is beyond the scope of the roading budget for the next ten years, it would seem a cheaper and simpler approach would be to simply inform drivers about the effects of roadside hazards. This may not achieve 100% success but it is significantly better than nothing.

New Zealand is operating a peculiar mixture of the crime model and the injury prevention model. While Road Controlling Authorities (lead by NZTA) are moving toward an injury prevention model the field of driver information is locked into a crime model which assumes drivers' lack of knowledge is solely their own problem and should be punished.

New Zealand needs to recognise that while the Government cannot take responsibility for driver judgement, that judgement needs to be better informed about potential sources of injury especially when those sources cannot be managed in any other way.

10.0 Vehicle Factors - a dearth of data



New Zealand's fleet consists of relatively small number of vehicles under six years old (the seventh year is the year of the Japanese Shaken test that effectively eliminates these vehicles from the Japanese fleet), a huge number of vehicles between seven and 17 years old, and a long tail of older vehicles.

New safety technology enters the fleet through new vehicles, typically bought by organisations that can expense the $25,000 to $40,000 depreciation cost. By eight years vehicle prices have compressed into a band between $18,000 and $9,000 which kiwis find affordable. If our dollar were equal to the US dollar this amount would be enough to buy a new car. New Zealand gets the fleet safety qualities that the value of its currency can purchase.

The safety qualities of the New Zealand fleet are not recorded in any database. This means that evidence relating to life-saving technology in vehicles is simply not available.

Airbags

While airbags have been part of the Warrant of Fitness inspection process since 1998, they have yet to be included on the Police Crash Report form. **This means there is no data on airbag deployment in road crashes. Airbags may be saving lives but there is no way to tell from New Zealand crash data.**

The Motor Vehicle Register also has no data on airbags. Moreover there is a big difference between a vehicle with frontal airbags and side or curtain airbags. Whilethey are promoted by MoT, NZTA records no data on either.

Electronic stability control

As with anti-lock braking systems there is no data available on which vehicles, or even models are fitted with electronic stability control. While manufacturer studies suggest that ESC will assist in the reduction of injuries by up to 15%, this will not be verifiable. Once again it will be impossible to tell because the data is not captured either by the Motor Vehicle Register or by the Crash Analysis System.

Collision avoidance technology

Vehicle manufacturers believe they have gone about as far as they can to improve vehicle "crashworthiness". The next stage is collision avoidance. This involves equipping vehicles with radar and intelligence to avoid collisions. Such technology is already available in a few luxury models in New Zealand.

11.0 Emergency services

According to the European Road Safety Observatory, "*in a review of 1970-1996 data in several OECD countries it is suggested that between 5% and 25% of the reductions in road crash fatalities may have been due to improvements in medical care and technology (including trauma and emergency response systems".*
The role of ambulance and fire services, many of whom are volunteers, in reducing the fatality rate in particular is critical. Air ambulance services are also vital for improving outcomes. The funding of these services via the ACC must be fully integrated into a safety strategy.

12.0 Pedestrians and cyclists

A surprising number of fatally injured young pedestrians are drunk when struck.
Distracted pedestrians are likewise just as likely to be involved in a collision but are far less protected.
Pedestrian road-safety messages should continue, particularly for teenagers.

The rate of cycle injury is low as is the non-recreational use. While engineers have promoted cycleways their design is often impractical.

Improving the safety of vulnerable road-users requires establishing a clear heirarchy of routes. Low-speed, medium-speed and high-speed zones should have differing levels of protection for vulnerable users.

The safest routes for non-vehicular traffic are dominated by non-vehicular traffic. There is good reason to provide such facilities either exclusively or as part of a low-speed, low-traffic environment.
Pedestrians should not be used to create a low-speed environment in high-traffic-volume areas.

13.0 Motorcycles - in denial

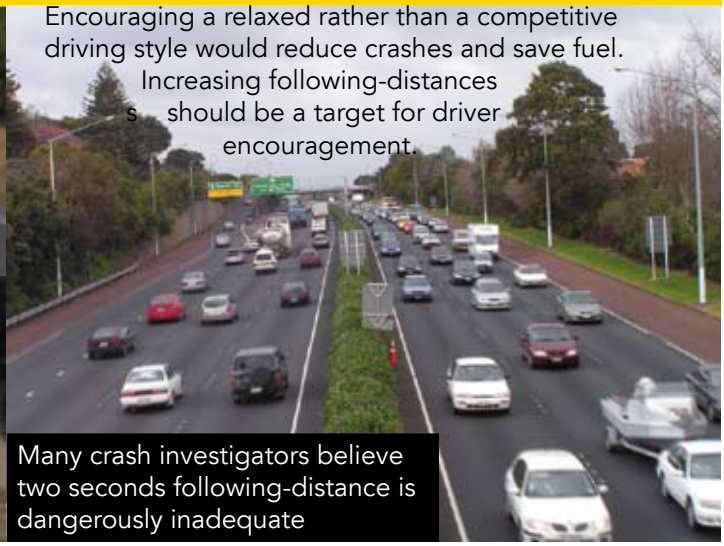
The motorcycling community is a passionate lobby with a strong sense of camaraderie. But the risk of motorcycling is not met by its ACC costs, so **motorcycling is the only dangerous activity *subsidised* by the ACC**. Motorcyclists are convinced that all other road-users contribute to their risk but of 2,303 fatal and serious moped and motorcycle crashes between 2003 and 2008, 2000 were classed by Police to have been caused by the motorcycle or moped and half of these only involved one vehicle. Motorcyclist claims that wire rope medians are "cheese cutters" have been roundly dismissed by Monash University Accident Research Centre.

14.0 Low-cost safety interventions for drivers

Dark cars and truck, no lights

If 47% of crashes are coded "poor observation"it is fairly obvious that drivers are simply not seeing other vehicles.This should be relatively simple to cure by encouraging motorists to drive with their lights on.

Bright truck, car headlights on



Encouraging a relaxed rather than a competitive driving style would reduce crashes and save fuel. Increasing following-distances should be a target for driver encouragement.

Many crash investigators believe two seconds following-distance is dangerously inadequate

15.0 Other issues

Cellular risks

The Virginia Technical Transport Institute 100-car study found that by far the main source of distraction causing crashes was cell-phones. Waikato University research has confirmed crash-risk increase from the use of a cell-phone while driving is similar to alcohol consumption. While a ban on handhelds is a start, research shows that problems stem from conversations when one party is oblivious to the driving task.

The telecommunications industry should do more to improve the safety of their customers than use the ban on handhelds as an excuse to sell hands-free kits.

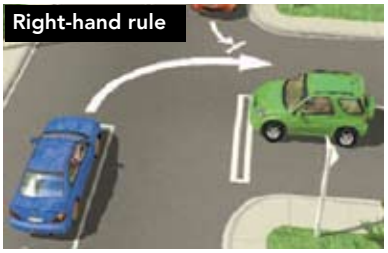
Hazards

If the pole had been frangible this man would not be fighting for his life. In most nations a collision with roadside furniture would see the utility sued. Here the pole will be replaced, and the ACC will pick up the pieces. While exemplary in many ways the flaw of the ACC "no-fault" legislation is that it shields organisations who could do more to protect the public. The public is largely unaware of the number and danger of roadside hazards close by state highways and local roads. Frangible poles should become an industry standard.

Impaired driving

New Zealand's incidence of drugged driving is almost certainly higher than reported. The same is also true of drowsy driving. The difficulty in both cases is that there are often no measureable levels of impairment. In both cases the onset of impairment can be gradual and insidious. While Philips will release later this year a saliva based 90-second handheld detector for cocaine, heroin, cannabis, amphetamine, and methamphetamine the central issue is impairment. Police must be able to identify, test impairment, and detain impaired drivers whatever the cause of their impairment.

Road rules



New Zealand can expect to see vistor numbers reach around three million before 2020. Many of these vistors will opt to drive rental cars. Adopting international standards for driving rules, as well as signs, helps reduce confusion as the driving public becomes international. Following Victoria's lead of reversing the right-hand rule would make New Zealands driving rules more like those in Australia – the source of most of our visitors. By adopting similar driving rules as Australia the Government would create a more coherent tourism destination. It would also eliminate a rule that all Government transport agencies have sought to reverse.

Information and attitudes

While New Zealand has stuck firmly to social marketing as an adjunct to enforcement, Australia has recognised that driver information campaigns on matters like fatigue cannot be linked to enforcement. Moreover the Australians have gone further with social marketing campaigns to denigrate anti-social driving behaviour. The object is to achieve a social concensus similar to that achieved on drink-driving. The "small finger" campaign is aimed at young men showing off.

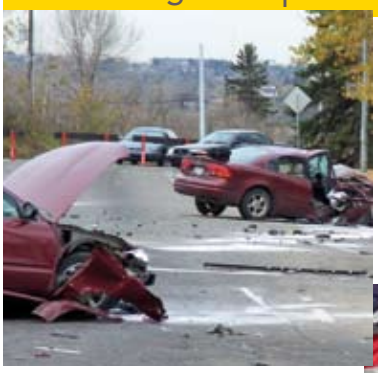
Intersection crashes are roughly a third of crashes by social cost. Two-thirds of the social cost is in 50km/h zones and one-third at faster intersections.

Give way signs at T-intersections are the most problematic traffic-control device in New Zealand. They are closely associated with crashes coded to "poor observation", i.e. people not seeing other vehicles.

Interestingly, STOP signs are less associated with crashes than either give- way signs or even traffic lights. Give-ways at roundabouts are definitely safer than giveways at T and X junctions. This would suggest that replacing some give-ways with stop signs may assist in reducing crashes.

More research into gap acceptance, and the knowledge, practical application and value of the road code might also help reduce intersection crashes.

16.0 Linking it all up



Action at crash scenes often relies on volunteers and by-standers. The efficiency and effectiveness of rescues should be public and documented for learning.

The first role of police is to ensure public safety, but their secondary role is to bring prosecutions. Police officers should also make recommendations for specific crash sites outside the scope of prosecution.

Medical information has a role to play in informing automotive and roading engineers about the effectiveness of safety treatments (e.g. airbags). The role of emergency services in injury outcome should also be part of crash records.

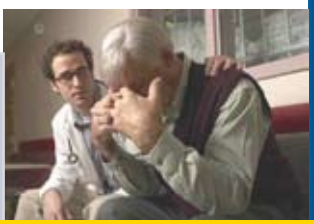
Local authorities very rarely invite public scrutiny of their roading system – especially after a crash. In the case of death coroners may criticise but there is no public come-back. More participation is needed.

A crash scene generates a lot of information. At present that information is scattered between Police, Road Controlling Authorities, NZTA, ACC, and Corrections. NZTA has up to 4 relevant but unconnected databases.

Many victims wish to contribute to society by warning of their experience. Facilitating this would provide opportunities for learning and recovery.

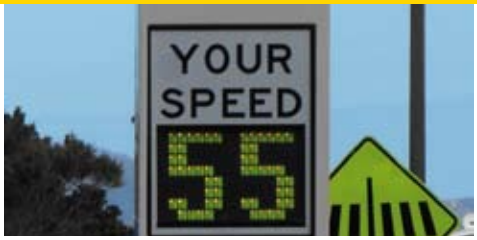
Automotive manufacturers spend fortunes making their vehicles more crashworthy. Holden even investigates crashes in NZ. There should be a better connection between crash reports and vehicle data, starting with airbags.

Nothing is "corrected" if people don't change. For many a crash is transforming. Only by treating the cause of offending can it be corrected.



17.0 Smarter enforcement

If road safety is everyone's responsibility police need to get everyone more on-side. Few respect the cop hiding behind a bush with a speed gun. This means leaving more infringement-issuing to automatic systems, and staff using the inter-personal skills expected of Police officers.



For the most part the public can enforce their own speed. Radar speed feedback signs such as this increas limit compliance up to 60% where installed. This reinforces the view that drivers manage their speeds on the basis of more cues than limit signs and their speedometer.

While NZTA is deploying cameras across the highway network, Police have been reticent about accessing them for enforcement. A survey of AA Members has found that they are relaxed about the use of highway cameras for enforcement if the public have access to them.

18.0 Objectives of a strategy

There is no point having a strategy if it does not do anything. The object of any strategy is to coordinate resources towards the achievement of a clearly defined goal. A document that does not specify resources, or provide a meaningful role in coordination or a clearly defined goal for their employment is an action-list, not a strategy.

The following resources need to be coordinated for road safety:

- **The New Zealand Transport Agency**
- **Road Controlling Authorities**
- **New Zealand Police, the Justice Department and Corrections Department**
- **Accident Compensation Corporation**
- **The Ministry of Health and District Health Boards**
- **The Ministry of Education and schools**
- **The New Zealand Fire Service and Ambulance Services**
- **The New Zealand Automobile Association**
- **Firms connected with roadside furniture (telecommunications, energy and post)**
- **Driver educators**
- **Automotive suppliers**
- **Automotive insurers and repairers**
- **Community groups**
- **Employers**

A strategy should specify:

- **Its conditions for success or failure, including targets**
- **The broad directions of the strategy to achieve success**
- **Crucial decision-points in those broad directions**
- **The role and scope of intelligence for altering or changing directions**
- **What its resources must do and when they must do it by.**

In Australia and the United Kingdom the political dimension of road-safety policy is managed through a cross-party committee on road safety, so that politicking over road safety is kept to a minimum and its importance is given due political emphasis.

There is international literature on the qualities of a successful road safety strategy.

Dr. Rune Elvik, Institute for Transport Economics, Oslo
Setting goals– Effective road safety target setting
This paper reports a study of the effectiveness of quantified road-safety targets set by local or national governments. A total of 28 quantified road safety targets have been assessed, of which 12 were set by local governments and 16 set by national governments. A statistically significant difference in safety performance associated with quantified road-safety targets is found when countries or local governments that have set targets are compared to countries or local governments that have not set quantified targets. The largest difference in safety performance is associated with long-term, ambitious targets set by national governments. On average, countries or local governments that have set quantified road-safety targets have experienced a 0.8% greater annual reduction in the number of road-accident fatalities after targets were set than countries or local governments that did not set such targets.

While avoiding numerical targets may avoid political embarassment, there is evidence the public would pay for this with their lives.

18.1 The 2020 Road Safety Strategy in a global context

As we have seen, by almost every measure the 2010 Road Safety Strategy was a failure. Unless this is acknowledged the failure will be repeated. It is not sufficient, however, to simply condemn the 2010 Strategy as a failure. What is important is to determine how and why that strategy failed to avoid repeating it. Where the 2020 Strategy and the 2010 Strategy concur must be examined for failures either of conception, evidence or implementation. There is simply no point repeating the same work if we already know it will not make a difference.

In the following pages we examine the performance of the 2010 Strategy against its objectives. This, however, must be seen in the context of the design of a Road Safety Strategy to 2020.

One important difference between the 2010 Strategy and the 2020 Strategy is a global context. Following a meeting in Moscow this year the United Nations is expected to agree to a plan for making 2010–2020 the decade of road safety.

New Zealand already plays a considerable role in international road safety. It fills the gap between world-leader experience (such as Sweden, Norway, Britain and the Netherlands) and developing nation experience. Developing an effective 2020 Strategy could only enhance this role. However, a repeat of the performance of the 2010 Road Safety Strategy's failure to reduce social cost per kilometre travelled will do New Zealand's reputation harm. The 2020 Strategy must achieve its targets in a way that inspires other nations.

CALL FOR A DECADE OF ACTION FOR ROAD SAFETY 2010-2020

5 Million lives will be lost and 50 million serious injuries inflicted unless there is change.

Why we need international action on road deaths

Road traffic crashes kill more than 3000 people, including 1000 children and young people, every day. Annually, 1.3 million are killed and at least 50 million are injured. More than 85% of these casualties (and 96% of child deaths) occur in low and middle income countries.

Many of those killed or injured are pedestrians. They are also breadwinners for their families. And by 2015 road crashes will be the leading cause of premature death, and disability, for children above the age of 5 in developing countries, unless we act now.

International efforts to combat road deaths command a tiny fraction of the resources rightly deployed to fight other comparable global killers, like Malaria. Yet safe roads are vital for achieving many of the UN's development objectives.

Achieving a Decade of Action for Road Safety

In developing countries the number of people killed on the roads is predicted to rise by at least 80% over the next 20 years

We can avoid this terrible prediction, and save millions of lives, if the 2009 UN Ministerial Conference on global road safety commits to take serious action.

We know what works: making vehicles safer and designing roads to be safe for all road users; tackling inappropriate speed and drink driving; promoting seat belt use and helmet wearing; improving driver training and police enforcement; taking care to protect the most vulnerable road users like children and pedestrians.

But many developing countries need international assistance if they are to improve road safety and develop their own home-grown technical expertise. The solution: a ten year, $300 million Action Plan, combined with a global target to cut by 50% the predicted increase in global road deaths between 2010 - 2020.

As a part of the global automobile club network the New Zealand AA endorses the call for a United Nations decade of action on Road Safety.

MAKE ROADS SAFE
www.makeroadssafe.org

18.2 2010 Strategy. Flawed strategy or flawed implementation? - Targets

Was the 2010 Strategy flawed, or was it the implementation of the strategy that delivered less than satisfactory results. The test to determine the solution to the question is whether the implementation reflected the strategy or not. If the implementation reflected the strategy, the strategy was flawed. If the implementation did not reflect the strategy the implementation was flawed and the strategy was redundant.

According to the 2010 Strategy (Page 22)
The strategy's key priority-areas for action involve:

- engineering safer roads
- reducing speed
- combating drink-driving
- dealing with serious offenders
- encouraging the use of safety belts
- improving safety for pedestrians and cyclists
- improving the vehicle fleet
- new and better targeted education initiatives.

Some of these action areas have been consistantly monitored over the life of the strategy.

Reducing speed

"We need a comprehensive effort targeting inappropriate and excessive speed if we are to achieve the 2010 goals. Developing a New Zealand approach to reducing speed will include consideration of a range of measures designed to persuade people to lower their driving speed on both rural and urban roads, and to achieving a change of culture that makes speeding as unacceptable as drink–driving."

RSS 2010 P24

Open-road mean speeds have declined from 100.2 km/h in 2001 to 96.3 km/h in 2007
Urban average speeds have declined from 55.2 km/h in 2001 to 52.5 km/h in 2007

Since 2001 on average 16% of injury crashes and 31% of fatal crashes have involved travelling too fast for the conditions, but as conditions vary this does not necessarily mean over the speed limit. Some speed crashes are also alcohol crashes. Claims relating fatalities to decreases in mean speed are not supported by the data (see p12).

Combating drink-driving

" The risks of a fatal crash while driving at the current legal limit are alarmingly high. This is not surprising, considering that the average male would need to consume about six standard drinks without food in 90 minutes to reach the current adult blood alcohol limit of 80 mg/100 ml. The evidence from other jurisdictions that have lowered their limit is that this reduces the number of alcohol-related crashes, including the number of crashes caused by drivers with very high blood alcohol levels."

RSS 2010 P25

Changes to the reporting of data in 2006 make trend-comparisons difficult.
Since 2001 on average 13% of injury crashes and 28% of fatal crashes have involved alcohol as a contributing factor. Some alcohol-related crashes also involve driving too fast for the conditions.

It is notable that offence rates have increased in recent years due to increased focus on youth limits.

Encouraging the use of seat-belts

"However, the rate of safety-belt use could be further improved. The 2003 survey of front safety belt use by adults found eight percent of drivers and front seat passengers were unrestrained, a figure which has remained unchanged since 2001. Improvements can be made through increased enforcement, supported by education to persuade those who don't wear them of their advantages and to remind wearers of the need to use them at all times."

RSS 2010 P27

From 2001 to 2007 front-seat adult passenger rates have improved from 92 to 95%, rear-seat adults from 70 to 87% and child restraints from 82 to 91%.

Improving safety for pedestrians and cyclists

"Work is underway on a strategic framework for pedestrian and cyclist safety, developing standards and guidelines for road network design, and improving data-gathering and research capability."

P28

The number of pedestrian injuries per 100,000 population has declined from 27 in 2001 to 21 in 2007. Cyclist rates have bobbed around at a low level. It is not clear whether this is proportionate to the decline in mode share by active modes over the same time period.

Other priorities and data

Improving the vehicle fleet

"Along with a competitive vehicle market, consumers today have access to relatively cheap, safe vehicles. Over time, these vehicles tend to become more affordable to groups overrepresented in crash statistics. However, vehicle safety can be introduced more quickly. For example, we have sped up the introduction of frontal impact standards to the fleet by prohibiting imports of vehicles that do not comply."

P28

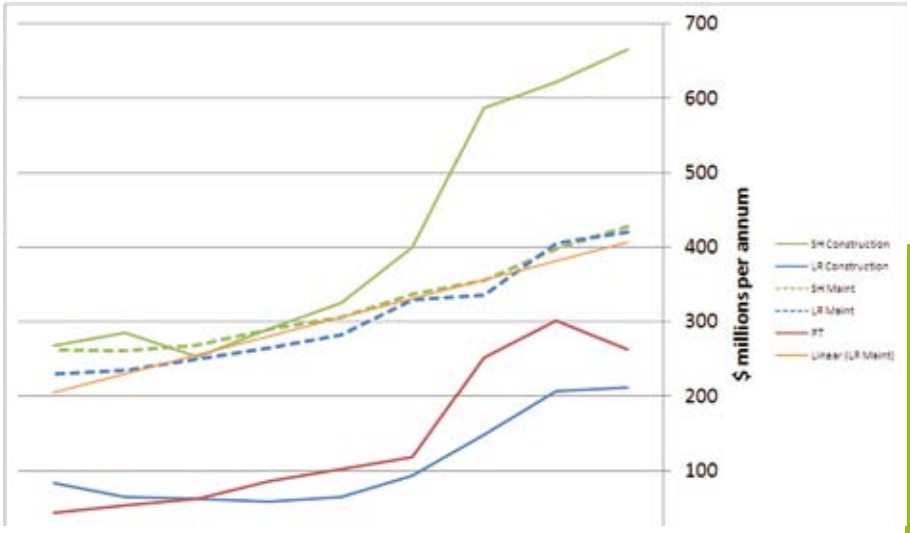
The best data on the Light Vehicle Fleet is published by MoT: "*The New Zealand Light Vehicle Fleet; Statistics: 2006*", published in 2007. This shows the majority of the light fleet dates from 1996 to 1999. 1996 was the critical cut-off year for frontal impact standards. Given the economic downturn since 2008 it is unlikely that older vehicles are being replaced. The net result must be that fleet improvements will stall for the foreseeable future.

New and better targeted education initiatives

Education is mentioned 31 times in the 2010 Strategy, but usually along with enforcement. Exceptions include RoadSense, Ata Haere, the Graduated Driver Licence System, and community education programmes for Maori and Pacific Islanders.The best statement on education initiatives was published by the National Road Safety Committee in 2006 as Road Safety Education / Strategic Framework. The first steps to action to implement the strategic framework summarised in page 17 did not proceed due to agency changes and perceived low priority.

Engineering safer roads

The extent to which more effort is being spent on engineering safer roads is difficult to unravel from the overall National Land Transport Programme. While the NLTP has increased steadily the Ministerial Inquiry into Roading Costs noted that the costs of both construction and maintenance have increased significantly over this time as well. It is therefore difficult to know to what extent engineering safer roads has contributed to the 2010 Strategy goals. What is notable is the change in the Minor Safety Projects funding which increased from four percent of the total maintenance budget to eight percent in 2004/5.



Y.E	$m minor safety projects
2008	52.08
2007	57.89
2006	51.15
2005	50.62
2004	21.52
2003	20.2
2002	18.85
2001	11.25

The 2009 NLTP has set minor improvements at around $30m per year each for state highways and local roads for 3 years.

Dealing with serious offenders

There are no metrics, or even definitions available for this topic. The performance of the judiciary is open to question.

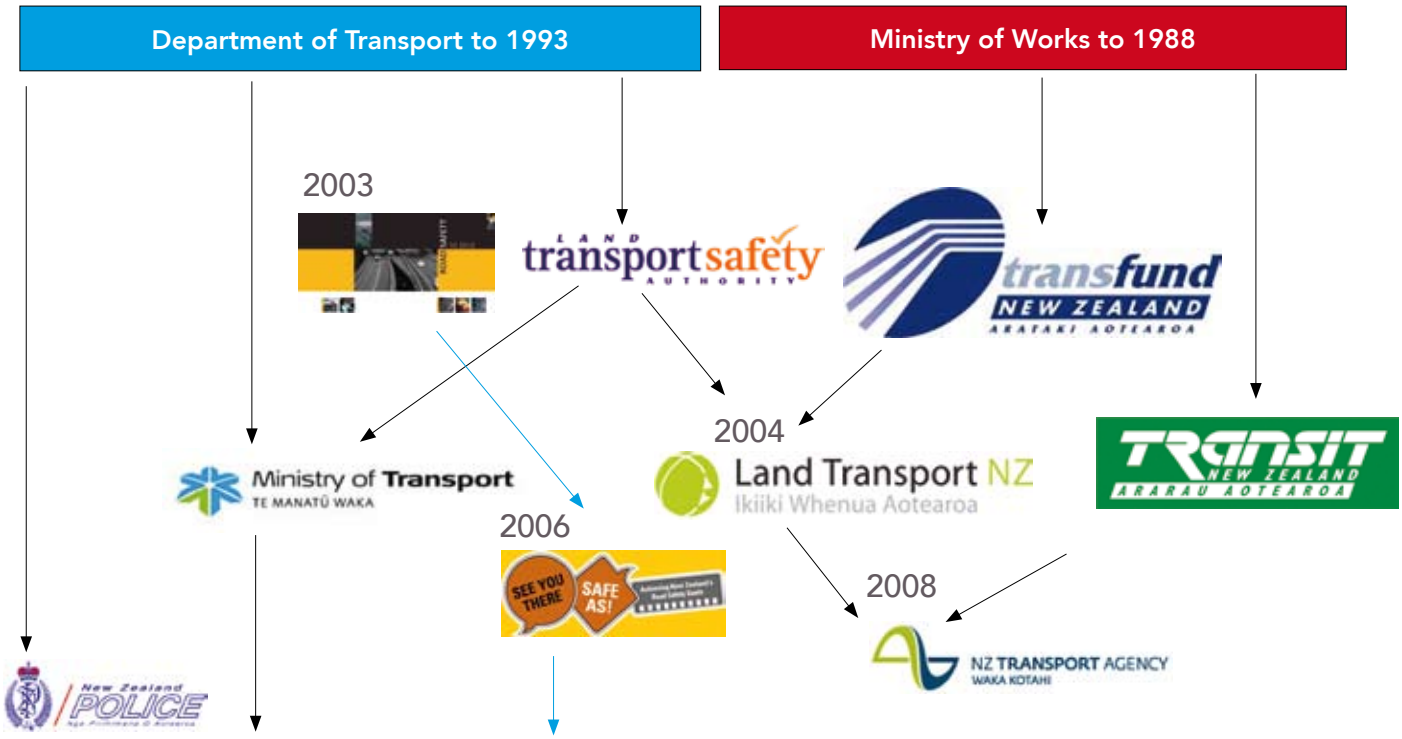
Assessment of achievement of 2010 key priority-areas for action against published data:

Engineering safer roads	No metrics. Some positive indicators.
Reducing speed	Clear data. Positive indicators. Effect less than predicted.
Combating drink-driving	Unclear data. No positive indicators.
Dealing with serious offenders	No metrics. No data. No evidence of achievement.
Encouraging the use of safety belts	Clear data. Positive Indicators.
Improving safety for pedestrians and cyclists	Clear data. Some positive indicators.
Improving the vehicle fleet	No metrics. No data. No evidence of achievement.

The 2010 Road Safety Strategy achieved most of its numeric sub-targets. The problem was that these did not affect overall outcomes. For other targets there was a lack of any consistent or coherent system of progress-measurement against key objectives. Only where priority-areas were covered by contractual relationships (eg Police) was any attempt made to quantify progress. The result was that areas not quantified were not any agency's responsibility and progress was neither monitored nor achieved.

18.3 2010 Strategy. Flawed strategy or flawed implementation? – Agencies

The period from 2001 to 2009 has seen considerable change and churn in the land-transport sector. The continual reorganisation of agencies has resulted in implementation delays and confusion regarding the role of the Road Safety Strategy vis-a-vis other transport strategies.



The draft 2010 Strategy was circulated in 2001 but it was not until 2003 that the final strategy (a far less detailed document) was finally published. The strategy was very much the brainchild of the Land Transport Safety Authority, which had been created by the break-up of the Department of Transport in 1993. The LTSA was broken up in 2004, with policy staff moving to the Ministry and operational staff to Land Transport. The first review of the strategy and its 2004 interim targets was conducted in 2004 by Jeanne Breen. The next major policy development was the "See You There Safe As" engagement under the auspices of the National Committee on Road Safety but largely driven by the Ministry of Transport. This carried out a wide engagement with the public and was supported by New Zealand Police but not by Land Transport New Zealand. The result was the 2006 Road Safety Policy Statement. Once again, where instititutional integrity was strong momentum, was maintained but where ideas had no institutional support progress faltered.

Important Government stakeholders

Department of Corrections · Ministry of Health · Te Puni Kōkiri · Department of Labour · Ministry of Education – Te Tāhuhu o te Mātauranga

The 2004 Breen Review recommended the expansion of the National Road Safety Committee to improve engagement with other affected agencies. While Chief Executive meetings may assist, actual engagement requires greater integration further down the management heirarchy. Aside from the ACC, engagement with other Government stakeholders has been relatively poor to date.

The 2010 Strategy was based on a set of interventions that could be controlled by the agency that developed it. The dissolution of that agency meant that ownership of the Strategy became questionable as the connection between funding and control became tenuous. Once again only the Police contract provided any unequivocal connection between policy and implementation. The growing engagement between Transit (now NZTA) engineers and the strategy has been based on interest in exploring overseas best engineering practice.

Any strategy is only important if it is connected to funding. All organisations respond to funding. If an initiative is not funded it is unlikely to happen.

18.4 2010 Strategy. Flawed strategy or flawed implementation? – 2004 reviews

The 2010 Strategy was reviewed independently by both Duignan and Breen somewhat prematurely (as Breen noted) in 2004. The Reviewers noted deficiencies in the strategy from the outset. These were not addressed.

LTSA commissioned two separate reviews of the 2010 Road Safety Strategy in 2004, slightly before the agency was disbanded. The Breen review was a strategy content review against international best practice carried out by Jeanne Breen. The Duignan review was a value-for-money economic evaluation of the LTSA spend on road policing.

The Duignan Review is relatively easy to critique because it draws attention to its own short-comings. The fundamental problem was lack of data. While there is plenty of data on Police-reported crashes and Police ticketing-rates and expenditure, the review could find very little that connected Police outputs to crash reduction. This was especially so as the review was forced to focus on fatal crashes, which is a very small population, with wide margins of error. The resulting report was based on a hotch-potch of LTSA estimates and guestimates based on dubious regression analysis. This illustrates the need for better data gathering from the out-set.

The Breen Review essentially compares New Zealand's strategy against "international best practice", which can be loosely defined as policies road safety officials approve of in other countries. The Breen Review found the following features of the New Zealand Road Safety Strategy to 2010 met, or was, international best practice.

Elements of New Zealand Strategy meeting international best practice identified by Breen:

1. Numerical targets "regarded as state of the art internationally"
2. Interim targets
3. System-wide approach to road safety
4. Value of statistical life based on "willingness to pay" principles
5. Evidence-based process
6. Recognition of need to accomodate human error
7. Recognition of need for improvement to road-users behaviour

Recommendations from Breen Review

The Breen Review included 38 recommendations for improvements many of which effectively suggested adopting British practice. Of these nine have been adopted - although two of these were basically to maintain current initiatives. In short, it is safe to conclude that the Breen Review was effectively ignored.

Notable Breen Review Recommendations included:
Recommendation 6: Update the value of statistical life to the 1998 value (1998$ 4.2m)
Recommendation 7: Legislate local authority's road-safety obligations
Recommendation 11: Establishment of a clear road hierarchy including self-explaining roads
Recommendation 19: Reduce BAC limit to 50mg/100ml
Recommendation 28: Heavy goods safety strategy including speed limiters
Recommendation 30: Older road-user safety strategy
Recommendation 33: Raise ACC premiums on motorcycles
Recommendation 35: An all-party Parliamentary Road Safety Committee as in Australia and Britain
Recommendation 36: An impartial lead road safety research organisation
Recommendation 38: Better data integration between ACC and CAS

Of these Recommendation 38 has hit privacy-law problems, although workarounds have been found and used.

Conclusions

There is no point reviewing a Strategy if there is no institutional interest in the outputs of the review process. The on-going governance of the 2010 Road Safety Strategy was compromised by reorganisation. Shortcomings in the strategy could not be captured or addressed. The Duignan Review, in particular, should have raised serious questions about the assumptions underpinning the Strategy.

LTSA's process of commissioning progress-reviews was an excellent method for illuminating short-comings in the 2010 Strategy. In practice, however, both reviews were ignored. The Duignan Review foundered on inadequate data, while the Breen Review made many recommendations the review agency was in no position to implement.

18.5 2010 Strategy conclusions

The 2010 Strategy was conceived and developed by an organisation tasked exclusively with improving land-transport safety (the Land Transport Safety Authority). The Authority developed a strategy based on a set of correlations between mean speeds, drink-driving, seat-belt use that have not withstood the test of time. Then the Authority was disbanded and scattered between Land Transport New Zealand and the Ministry of Transport. The combination of the failure of the original strategy and the institutional weakness of safety in the context of larger organisations meant that the robust process of review and reconsideration did not progress. The result has been a splintering of initiatives among disparate organisations. One of the consequences of this has been the resurgence of the Police in a policy advocacy role. This has led to Police openly agitating for law changes – something which has normally been regarded as poor form within our constitutional framework.

The failings of the 2010 Strategy can therefore be identified as:

Narrow theoretical model based on the link between enforcement and response, which meant that when the model was clearly failing there was no plan B.

Lack of institutional support and coordination outside agencies directly contracted to deliver outcomes.

Inability to respond to review recommendations because of changes in institutional arrangements.

Lack of cross-party support in the Parliament.

Low political profile and weight attached to road-safety issues, particularly compared to sustainability.

18.6 2020 Strategy lessons

The main lessons from the 2010 Strategy effectively come down to this:

1. High-level and multi-partisan commitment
Transport Safety should be taken seriously by all political parties. In Britain and Australia cross-party Parliamentary committees for road safety maintain higher profile for road safety, better focus, policy continuity and reporting.

2. A strategy to communicate
The strategy must coordinate the resources of many agencies, many of which have other priorities. Effective communication is essential between all agencies with focus kept on the main issues. Moreover it must be remembered that to work policy needs public support, and the public needs access to better safety information.

3 A strategy to learn
Rather than relying on a set of presumed correlations the system must be open to research and experiment. More effort must be put into research and the research must be directed at achieving the greatest reduction in injury at least cost. More investment is required in gaining information, coordinating information and sharing information. The system should allow experiment but also be audited to ensure safety at least cost to all.

The social cost metric

One of the core measures of a road safety system is the social-cost scale. This ascribes a statistical value of life (SVOL) and injury to crashes. This value is used as the basis for all benefit cost ratios connected with road safety.

The Breen Report pointed out that the SVOL used by the Government was less than its own research had found in 1998. While the SVOL has been adjusted for inflation over ten years it is still less than the 1998 value.

The SVOL is also silent on the weighting of *permanent* injury. The actual ACC cost of death can range significantly depending on the deceased person's circumstances. The actual ACC cost of a death of a 40-year-old on a good income with three children is far more expensive than a 17-year-old with no income. However, the permanent injury of the same 17-year-old is far more expensive than that 17-year-old's death.

As the vehicle fleet and health technology has improved, many crashes that would have previously resulted in death are now resulting in permanent injury. It is highly likely that in any stated preference survey many (especially young people) would pay more to avoid permanent injury than death. From a social-cost point of view it makes sense to distinguish between permanent and serious injury. Including a class for permanent injury in addition to fatality, serious and minor injury would provide a more accurate stated preference survey for the SVOL and bring these closer into line with actual ACC costs.

19.0 Toward a systematic, learning land-transport safety system

The concept of a learning system is based on a modern corporation. A corporation explores its future options while at the same time sustaining current operations. It carries out basic and theoretical research, and then applies it to models and prototypes. The prototypes are developed into concepts and then the concepts are worked into the production process. The corporation finally manages the legacy of old production and products.

A learning road-safety system would work in the same way. It would carry out research, then develop that research into applied projects and experiments. The basis of this learning it would then adapt its production systems and deal with change to its legacy assets.

The current New Zealand system differs from this in several important respects.

1. It does not do enough safety research. The total research budget is $5 million and is typically oversubscribed by bids from researchers by a factor of eight each year. The process of selecting successful tenders is democratic but not optimised.

2. The main tool for safety research and management – The NZTA Crash Analysis System – suffers from patchy data quality, lack of integration with other data sources, and is by today's standards old technology. Upgrading this system and its data sources would have a multiplier effect throughout the entire road safety effort.

3. There is little integration with international research into a standard topic reference. Almost every funded research programme begins with a literature review. If there were a New Zealand centre for assimilating international road safety research this could reduce the need for fresh reviews by maintaining watching briefs on specific subjects on an on-going basis. This could bring together social, vehicle and infrastructure research sources.

A Future CAS system should integrate more data sources with levels of privacy access.

4. The research output does not inform any process of change within NZTA or MoT systems. Change depends on administrators embracing the output of independent researchers. A clear example is the link between self-explaining roads research and the Manual of Traffic Signs and Markings.

5. Promulgation of new systems and methods through the road controlling authorities is also problematic as they are effectively laws unto themselves on issues of road-quality standards. By contrast, in the environmental sphere all Regional Councils are bound by National Air and Water Quality standards.

The Ministry of Transport should have more budget for, and influence over, improved information systems.

Evidence-based policy works best when all evidence is included in the evaluation framework. Our current system for gathering evidence is flawed and needs investment.

Public information

The crime model operates on the assumption that the public are all incipient offenders. Providing information is naturally at odds with prosecuting criminals. The injury-prevention model operates on the assumption that the public have an equal stake in preventing injuries as does Government. This model states that there is more to reducing injury than simply obeying the road code. Injury prevention requires that information on reducing injury be passed on to the widest possible audience in the most effective possible manner. While not all members of the public will heed the message, and while some members of the public are indeed incipient criminals, the net effect is beneficial. Failure to provide such information is a failure of duty of care.

New Zealand spends hundreds of millions of dollars on improving roads and roadsides, and policing the roads. It spends less than $5 million a year on road safety research. Its $30 million per year expenditure on public information is largely geared towards legitimising road policing, not providing information on matters only road users can manage. The money it spends on the CAS system itself is a tiny fraction of the sums spent based on the outputs of the CAS system.

The New Zealand road-safety system appears to assume it has the solutions and that doing more of them is the answer. Unfortunately it has no explanation as to why the social cost per vehicle kilometres travelled is now rising again. The system needs to reorient its expenditure. Doubling the sums spent on capturing new data, processing it and promulgating it would still leave hundreds of millions for improving and policing our roads. We would, however, have a better idea about how to be far more efficient spending it.

20.0 2020 Strategy - A change of approach

The most important change the Government can make to Road Safety in New Zealand is to adopt an injury minimisation approach instead of a crime prevention approach.

Information and evidence
The information systems on crashes, traffic, and motor vehicles operated by the NZTA are old. They do not capture enough information and they do not present it well. They are scarcely integrated with other information sources, such as ACC and hospitalisation records or Police prosecution reports. The data-entry is under-resourced to handle what should be the principal driver of safety policy and research.

Research and development
NZTA needs a systematic approach to research and development. The current system is underfunded and not based on any kind of Benefit-Cost. The system needs to start with an information clearing house to bring in international literature, then it needs pilot research and prototype development funding. The outputs of research must also be integrated into on-going operational systems.

Information enrichment
An injury prevention approach to Road Safety assumes that road users should be given as much information as possible about how to reduce injury. This includes honest assessments of road risk, and matters which only road-users themselves can effectively monitor. Examples include fatigue, cell-phone use and other distractions. Information should be available on driving with ESC. Information should be delivered in the way that sticks best. This may be speakers, TV, brochures or the web.

Route treatments
The current approach to road safety is to tack it on to general construction and enhancement projects. While this can be important there is a need for far more funding of entire route treatments. This includes median barriers, audio-tactile edgelining, hazard removal and changing corner markings and signage in accordance with the latest research. As we can't remove all hazards we also need to educate the public about roadside risks.

Teen education
The Graduated Driver Licence system needs amendment along the lines of the Swedish system. There is a need for risk education for teens relating to road users both as drivers AND as pedestrians. The school education system cannot be allowed to largely ignore the most significant risk to life facing their students. In-school education relating to road trauma and its causes (as opposed to driver training) is needed.

Road crime
The Police have already recognised that road crime and other criminal activity are linked. More effort policing licences, impaired driving (alcohol, drug, and fatigue), reckless driving, and vehicle compliance. For some audiences Police are useful educators, for others they are not. The issue, however, is no longer catching offenders but treating those who will not be deterred. More emphasis is needed on better options for Judges.

Political priority
The crime model of road safety has led to political turpor over road safety. If road trauma is regarded as the result of aberrant behaviour it appears that all politicians can do is "get tough". This is wrong. Improving road safety is a multidimensional puzzle. It requires politicians to understand the issues and a political concensus to deal with them.It also requires political leadership to motivate New Zealanders to wake up to the need to improve our poor safety record.

21.0 2020 Strategy – Saving lives, saving money

The only way a road safety strategy affects safety is through its effect on funding. If we spend the same amount on the same things we cannot expect to get anything other than the same unacceptable result.

Annual expenditure on transport
The public spend $9.5b a year on transport, much of it on private motor

Road safety expenditure
The total spent on safety retrofits, education, research and prevention is about $80 million per annum.

Road users

$835m Rates

Most of the money from rates, RUC, registration and petrol tax goes on road maintenance.

$634m Levies

$2,602m Taxes & charges

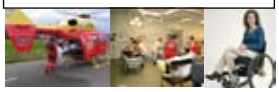
NZ TRANSPORT AGENCY WAKA KOTAHI

Of the $4 billion collected 10% is not spent that year.

$334m for fund

By far the bulk of the ACC MVA spending is on social rehabilitation and income maintenance

$300m for clients



$298m

Most of the funding provided to Police is spent on the Highway Patrol and speed cameras

MINISTRY OF JUSTICE

$100m collectable

$50m not

Fines

It is not enough for Government to isolate itself from the fiscal cost of road trauma through the design of the ACC scheme and the imposition of fines. This implies a tacit acceptance of road trauma as a legitimate business within Government. This is not morally defensible. Government's aim must be the elimination of the social and deadweight financial costs of road trauma, not its management. To do this it must be prepared to invest in reducing road trauma and expect to achieve a return on that investment.

Importance of local government

On page 7 we noted that an increasing share of road trauma is occuring on roads not directly controlled by NZTA. There are three main reasons for this:

- Lack of accountability by local government, and in particular local government politicians for road safety.
- Inability of local government to access NZTA funding due to lack of local co-funding and overly onerous application systems
- Lack of mandatory national standards for road-safety systems.

There needs to be greater recognition of the hierarchy of roads in the funding process. Urban roads with greater than 10,000 vehicles per day; and open roads with greater than 12,500 vehicles per day need greater risk reduction treatment than they are recieving.

Recycling fines revenue for road Safety

Using a proportion of fines revenue for road safety has been employed in Australia (Queensland, Western Australia and New South Wates), Britain and some states in the United States, although only Vietnam earmarks all of it. There is therefore nothing unusual about the concept. In most cases fines income is used to fund educational and research initiatives.

Best value?

Road safety is not the primary objective of any of the Government agencies charged with delivering it. The MVA account is added on to the ACC, just as the Highway Patrol is added on to Police. In roading projects safety is meant to be built into all projects. The problem is the profusion of agencies, the lack of research and coordination, and the tendency of agencies to promote their capabilities in order to secure operational funding. The Ministry of Transport should be required to prove the maximum social cost reduction per dollar spent is being achieved.

The Automobile Association calls for Government to increase its funding of road safety by additionally spending the equivalent of its collected fines revenue for each year until 2020.

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