

REPORT ON ROAD SAFETY PROGRESS SINCE 2000

DECEMBER 2009



CONTENTS

Executive Summary	3
Background.....	4
Overall trends.....	4
What targets were set in the <i>Road Safety to 2010</i> strategy?	11
Progress in key <i>Road Safety to 2010</i> outcome areas	12
Engineering.....	12
Speed management.....	14
Light vehicle fleet	20
Increased compliance – restraint wearing	23
Interventions targeting drink-driving.....	24
Young drivers	29
Education and public awareness.....	31
Efficiency gain	31
Why has progress not met expectations?	32

Executive Summary

This report summarises the progress that has been made against the estimated reduction in social cost outlined in the *Road Safety to 2010* consultation document. This document provided the framework for road safety actions and interventions for the last decade. It was released for public comment in 2000. The interventions identified in that document, and subsequently adopted, were progressed in three implementation packages in 2003, 2004 and 2007.

This report offers a limited statistical review of the interventions and outcomes to date as a result of the *Road Safety to 2010* strategy. Where possible, some explanations have been offered as to why the targets have not been met or predicted outcomes have not been achieved.

The report shows that there has been progress over the last 10 years, particularly when compared to the growth in vehicle kilometres travelled. Progress has been made in improving roads, vehicles and reducing speeds but not in reducing alcohol impairment.

It is, however, highly unlikely that *Road Safety to 2010* targets relating to fatalities and serious injuries will be achieved. While the 2008 road toll was the lowest since 1959, the 2009 road toll is tracking to be around 400 deaths in total.

The report indicates four possible factors that may have contributed to the targets not being met:

- some legislative changes, which were expected to deliver reductions in social cost, were not progressed
- the investment in engineering interventions was not at the level necessary to provide the predicted social cost reductions
- there has not been an appreciable reduction in alcohol/drug-related crashes over the last 10 years, despite highly visible enforcement and an increase in the number of breath tests administered
- the predicted efficiency gains were not achieved, possibly because mergers in the transport sector have had an impact on the road safety focus.

Road safety—progress over last 10 years

Background

This report provides a limited statistical review of the progress that has been made against the estimated reduction in social cost outlined in the *Road Safety to 2010* consultation document. This document provided the framework for road safety actions and interventions for the last decade. It was released for public comment in 2000. The interventions identified in that document, and subsequently adopted, were progressed in three implementation packages in 2003, 2004 and 2007.

The *Road Safety to 2010* strategy was founded on the 'Three Es Approach'. Each of the three implementation packages contained a mix of engineering, education and enforcement interventions. These included addressing black spots (high-risk sections of road), construction of safer roads, speed, vehicle safety, restraint wearing, drink-driving and young drivers.

Targets set in the strategy of no more than 300 deaths and no more than 2,200 serious injuries (measured by the number of hospitalisations) by 2010 are very unlikely to be achieved.

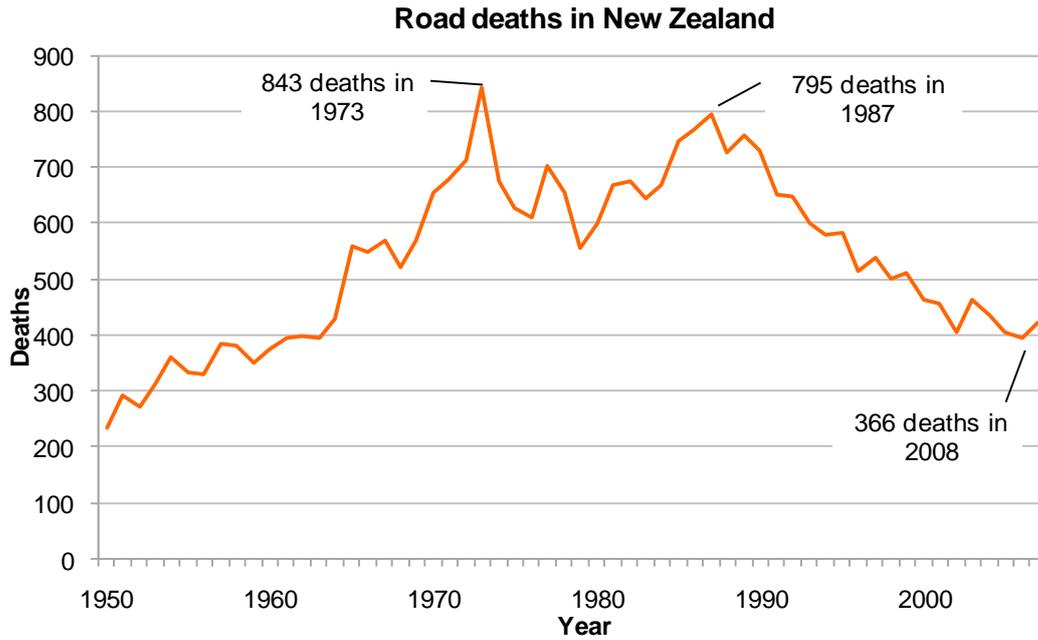
The following report offers a statistical review of the interventions and outcomes to date in relation to each of the areas listed above. Where possible, some explanations have been offered as to why the targets have not been met or predicted outcomes have not been achieved.

This report is not designed to be a full review of the *Road Safety to 2010* strategy. Conclusions offered are based on the range of interventions that have, or have not, been implemented, the outcomes seen since and any other factors that may have affected a particular outcome.

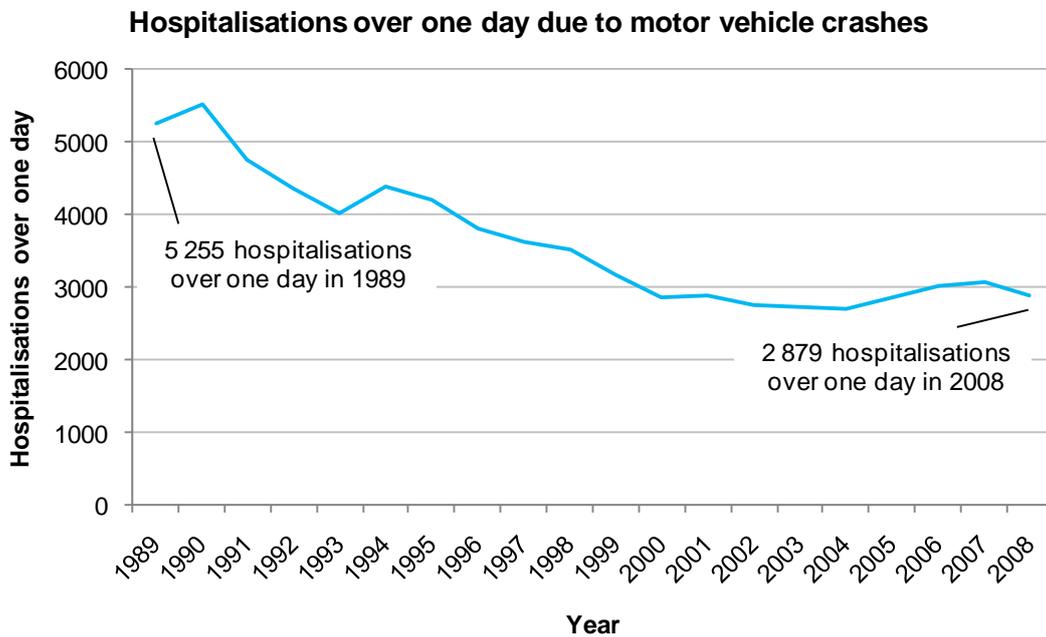
Unless otherwise stated, graphs, tables and other data provided in this memorandum reflect national figures.

Overall trends

Over the past 35 years, New Zealand's road toll has dropped significantly. Between 1973 and 2002, the number of people killed on our roads more than halved, despite a doubling in the number of vehicle kilometres travelled, as shown in the following graph.



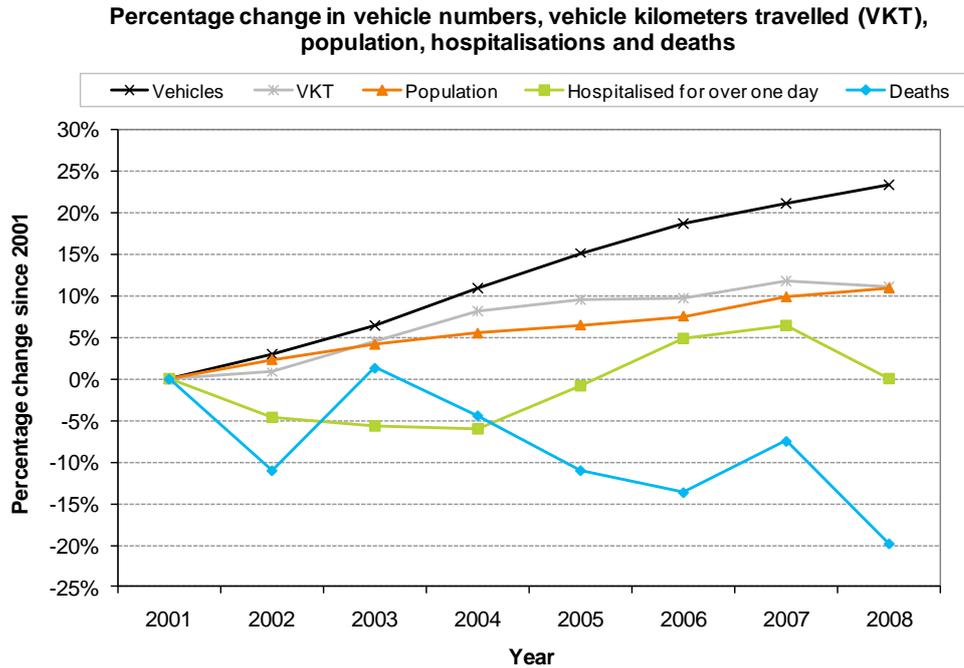
The number of serious injuries has also dropped considerably. However, as the graph below shows, progress has been much slower over the past decade or so, with a slight rise in the number of serious injuries from 2005 onwards (the second half of the 2010 strategy period).



Trends over the period of the Road Safety to 2010 strategy

Over the period of the strategy, the number of vehicles registered, the vehicle kilometres travelled (VKT) and the population have all grown. During this time, there has been a reduction in the number of deaths. However, there has been little change

in the number of hospitalisations¹. The graph below illustrates the percentage change from 2001 onward.

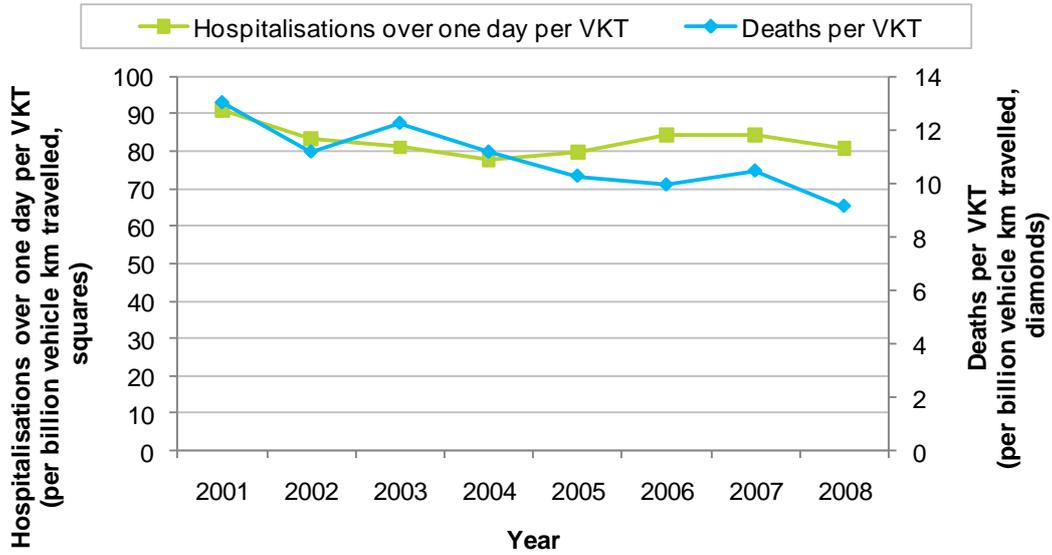


Overall deaths were 20 percent lower in 2008 than 2001. However, as there was a record low road toll in 2008, and the 2009 road toll is already comparatively high, it is more realistic to say the reduction over the last 10 years is about 12 percent, to around 400 deaths.

When taking into account the growth in VKT, a slight downward trend in hospitalisations can be seen, as shown in the graph below. However, this trend is more significant for deaths. Further, the period from 2005 to 2008 shows a plateau has occurred in the number of serious injuries (as measured by hospitalisations) per billion VKT.

¹ Hospitalisations of more than one day is the measure used to indicate serious injuries.

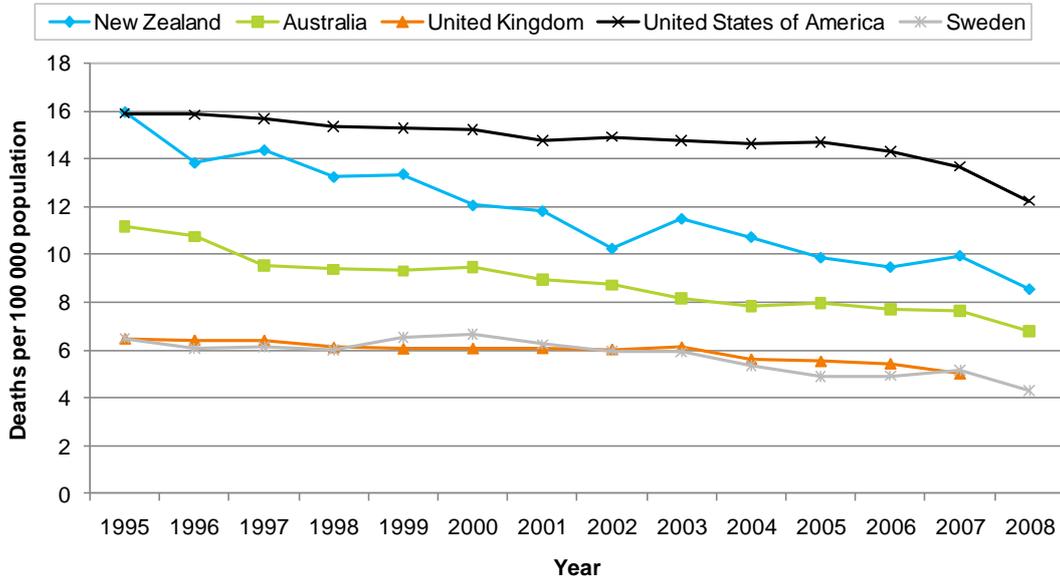
Deaths and hospitalisations over one day per billion vehicle kilometres travelled (VKT)



International comparison

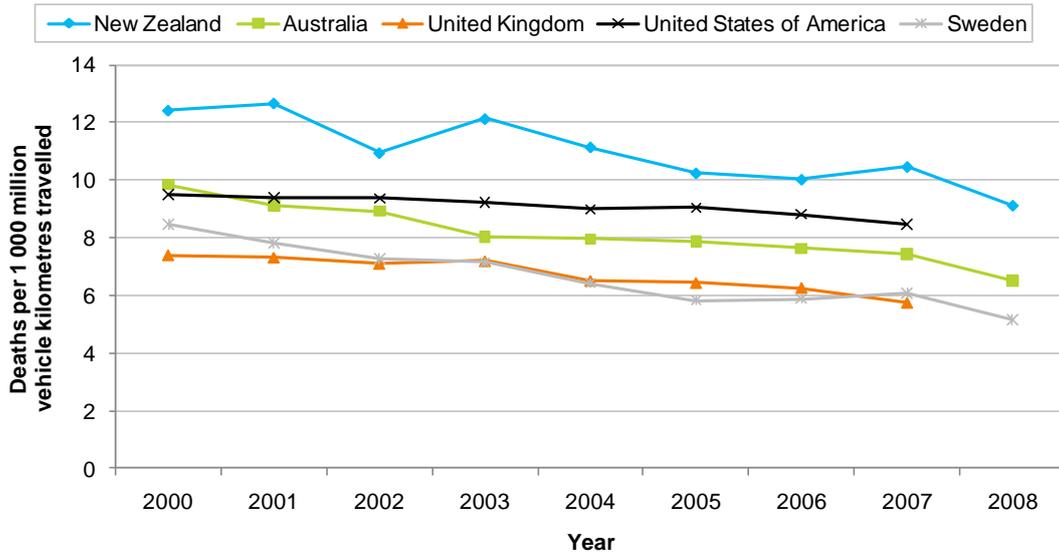
It is also important to measure road safety outcomes against other countries. When comparing death rates per 100,000 population across other comparable countries, New Zealand performs poorly, with only the United States having a higher rate.

International comparison of deaths per 100 000 population (IRTAD)



However, when measuring deaths in terms of VKT, New Zealand actually performs worse than the United States.

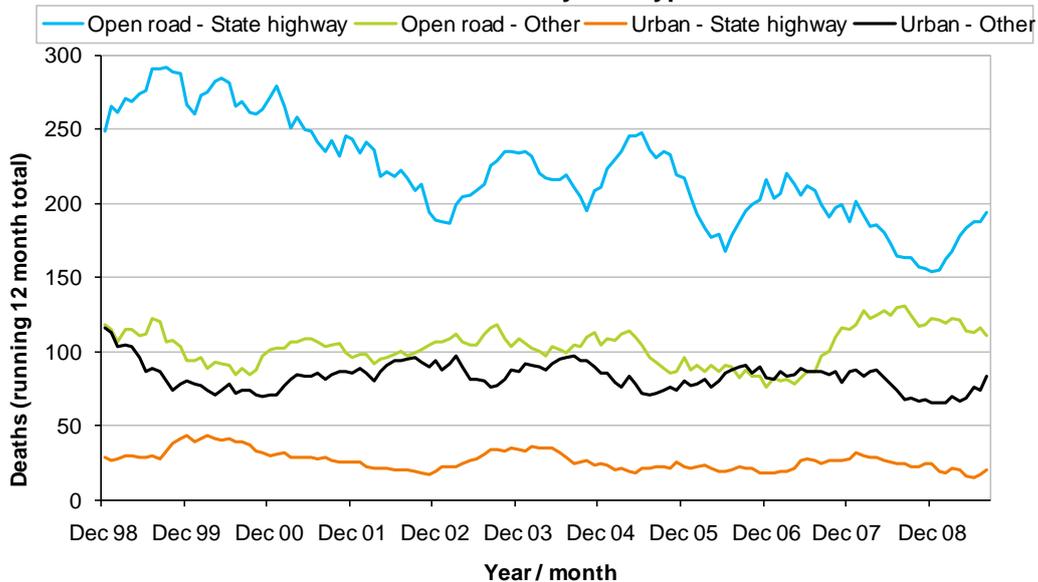
International comparison of deaths per 1 000 million vehicle kilometres travelled (IRTAD)



Trends by road type

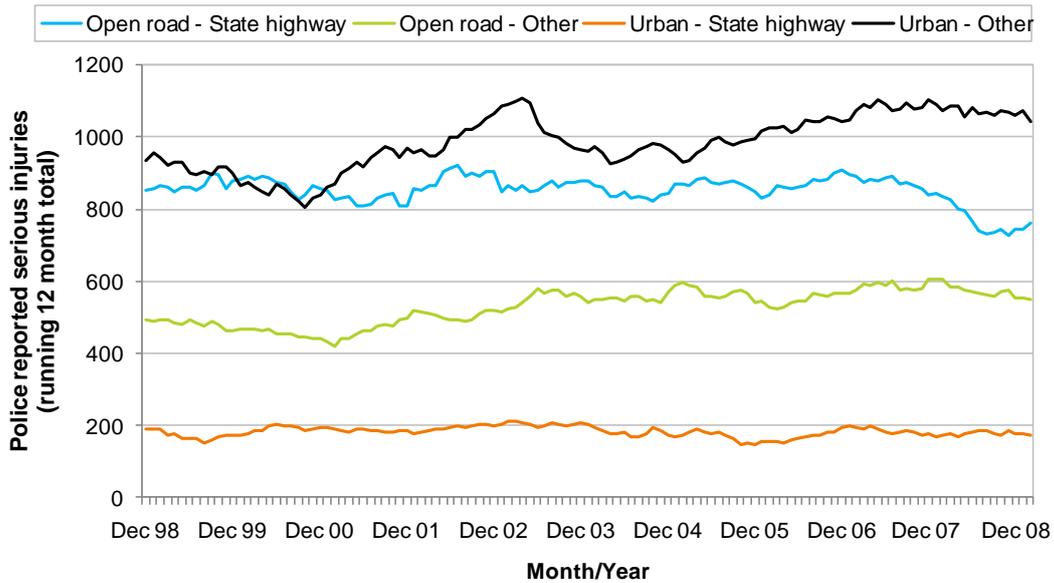
The preceding graphs provide an overall picture of the numbers of deaths and serious injuries. When breaking down these outcomes by different road types, further trends can be seen. The greatest improvement, as measured by the number of deaths, occurred on open road State highways. Progress has been minimal on the three other types of road. The number of deaths on other open roads rose in 2007 and has remained around this higher level since.

Road deaths by road type



In terms of serious injuries, there has been an overall decline in the number of injuries sustained on open road State highways. On urban roads, there has been an overall increase, with a lesser increase seen on non-State highway open roads.

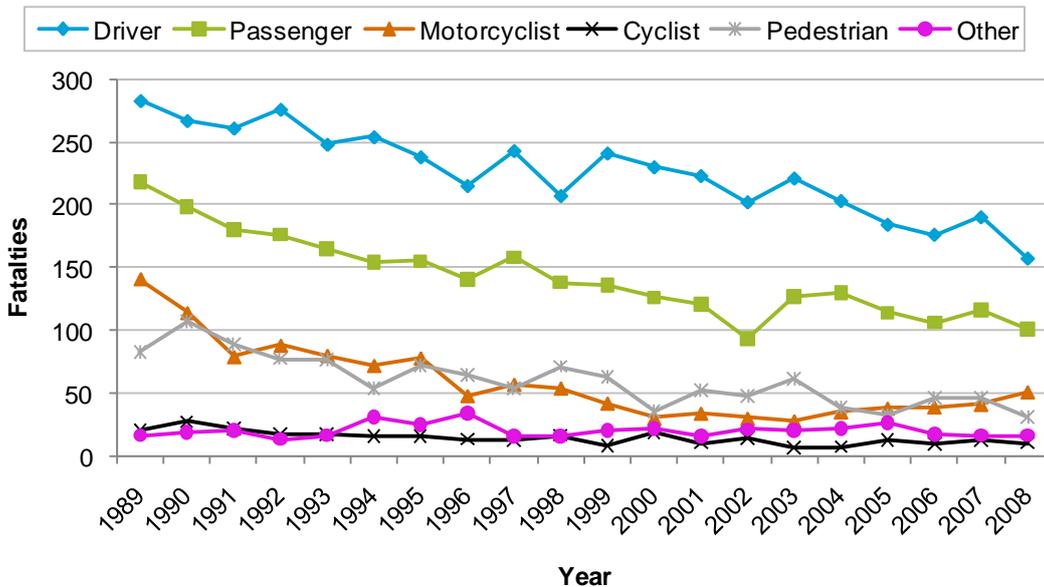
Police reported serious injuries by road type



Trends by road user type

Road safety outcomes can also be broken down by road user type. The decrease in the overall numbers of deaths is reflected in the trends for drivers and passengers, as shown in the graph below. There is also a downward trend for pedestrian fatalities, though this is less apparent from 2000 onwards. For motorcyclists, there was significant progress from 1989 till about 2000. However, from 2003 onward, the number of motorcyclist deaths has been consistently rising each year.

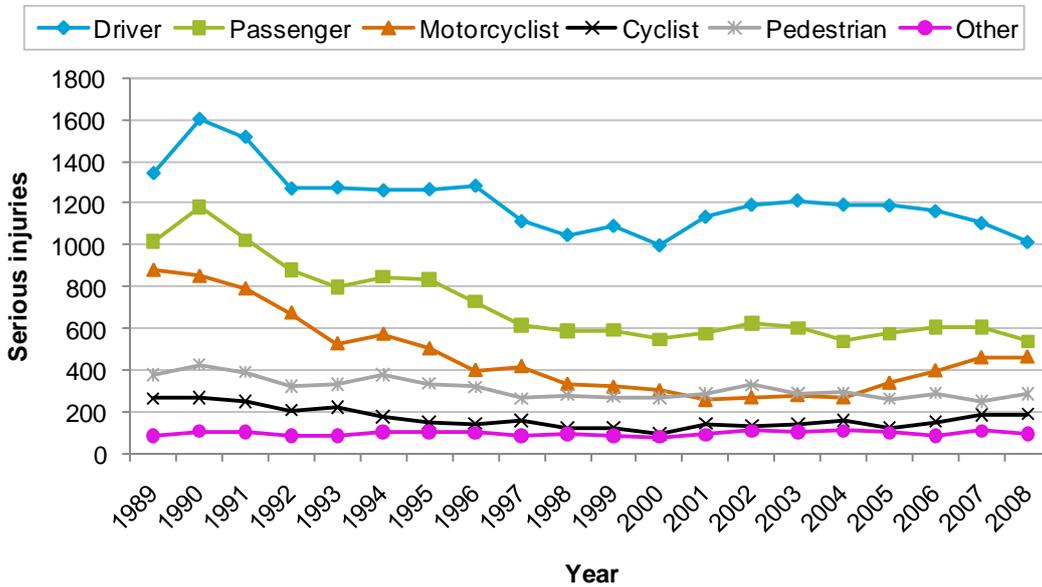
Fatalities by road user type



Similar trends can be seen in the numbers of serious injuries suffered by each road user type. The recent increase in motorcycling casualties becomes more apparent in particular, as shown in the graph on the next page. It also shows that progress in reducing the number of driver and passenger serious injuries has slowed. Driver

casualties went up from 2000, reaching a peak in 2003 before declining again to previous levels. For passengers, the trend is more static from 2000 onwards.

Police reported serious injuries by road user type



Notes on the data used above:

- The preferred data to measure serious injuries is hospitalisations. However, this is only available as a total number of hospitalisations and does not have information on the cause of the crash or the type of road user. This information is contained within New Zealand Police crash reports, therefore more in-depth serious injury data has been taken from the Crash Analysis System (CAS).
- The data used in the above section is primarily death and serious injury data. Data for minor injury and non-injury crashes is less reliable due to changes in reporting standards and practice over time. In particular, from 2001 onwards, there was a marked increase in injury reporting. This particularly affects the long-term trends, which is why there is a focus on fatal and serious injury data to assess the progress in road safety over time.

What targets were set in the *Road Safety to 2010* strategy?

The strategy set out overall targets as well as specific expected outcomes for key areas. The goal was to reduce the number of road deaths per year to no more than 300, and reduce hospitalisations (of more than one day) to no more than 2,200 by 2010. These targets were acknowledged at the time as ambitious, but achievable.

The consultation document set out expected reductions in baseline social cost for each key area, and for specific interventions. Three options were proposed – an engineering-focused approach, an enforcement-focused approach and a mixed approach. The mixed approach was progressed. The interventions where the largest reductions in social costs were expected are shown below.

Intervention	Expected % reduction in baseline social cost
Road engineering:	
• black-spot treatments	2.1%
• existing road safety construction	5.0%
• expanded road safety construction.	11.7%
<i>Total road engineering</i>	18.8%
Speed management:	
• urban roads	5.3%
• rural roads.	11.6%
<i>Total speed</i>	16.9%
Light vehicle safety improvements	15.5%
Increased compliance – restraint wearing	4.2%
Interventions targeting drink-driving:	
• reduced adult blood-alcohol limit	4.5%
• increased number of compulsory breath test operations	3.3%
• vehicle impoundment	1.9%
• licence suspension	1.5%
• mandatory alcohol interlocks for repeat offenders	0.6%
• zero blood alcohol limit for young drivers.	0.1%
<i>Total drink-driving</i>	11.9%
Raised driving age	2.6%
Education	Included in other interventions
Efficiency gain	9.0%

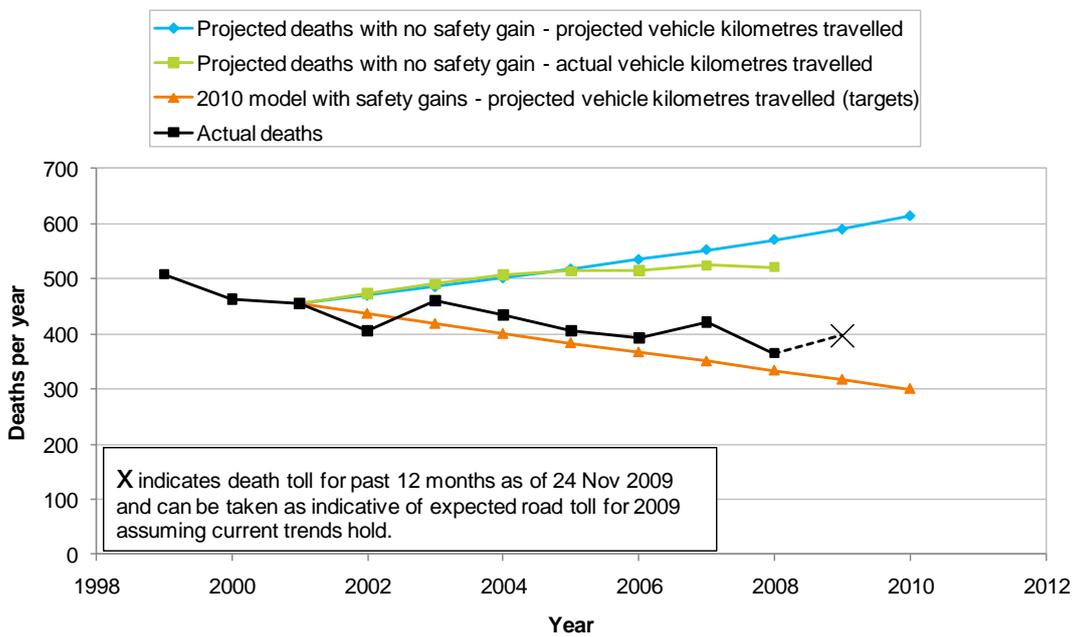
Note: over time, efficiency gains are expected so that the same outcomes are achieved with fewer resources, for example as a result of learning over time, better management and technology advancements.

This report identifies actions taken during the period of the strategy and assesses the progress against the targets outlined above. Areas where expected actions were not taken, or delivered poorer results than expected, are identified. The evaluation of the targets has been assisted by two reviews of the *Road Safety to 2010* strategy: the Breen review² in 2004, and the Duignan review³ in 2007. Additional research is referred to when relevant.

Progress in key *Road Safety to 2010* outcome areas

The graph below shows the actual road deaths over the period of the strategy, compared to projected road deaths with, and without, safety gains.

Actual road deaths compared to projected road deaths, with and without safety gains



While the target of no more than 300 road deaths a year has not been met, the actual number of road deaths, as represented by the black line above, does show a slight downward trend over the period of the 2010 strategy (note the expected figure for 2009 is around 400 deaths). The green line shows the projected level of road deaths, if no road safety interventions had been introduced since 2000. This shows that there has been some progress towards the goal to reduce road deaths, even though the target has not been met.

Engineering

The consultation document proposed three areas of engineering activity: black-spot treatments, existing construction and expanded construction. It was expected that the combined reduction in social cost across these three areas of activity would be 18.8 percent.

² Jeanne Breen Consulting, 'Review of the *Road Safety to 2010* Strategy', November 2004

³ Taylor Duignan Barry, 'Evaluation of Road Safety Outcomes to 2005', May 2007

Black spot treatments

Work relating to black-spots/black-routes under the strategy was mostly through crash reduction studies and Network Safety Coordination projects⁴. Information is available on some individual projects but overall monitoring is limited. The information that is available indicates that there has been a reduction of about 13 percent in crashes and social cost at treated sites compared with untreated sites. The magnitude of the reductions in social cost at treated black-spot locations was greater and more sustained over time than was expected.

However, high-level monitoring of the network was favoured over site-specific monitoring. There were also restructures in the transport sector. These resulted in some of the management functions being fragmented and changes to the way data is processed through the crash analysis system. The combination of these factors means that the expected 2.1 percent reduction in social cost, as a result of black spot treatments, cannot be confirmed.

Existing construction

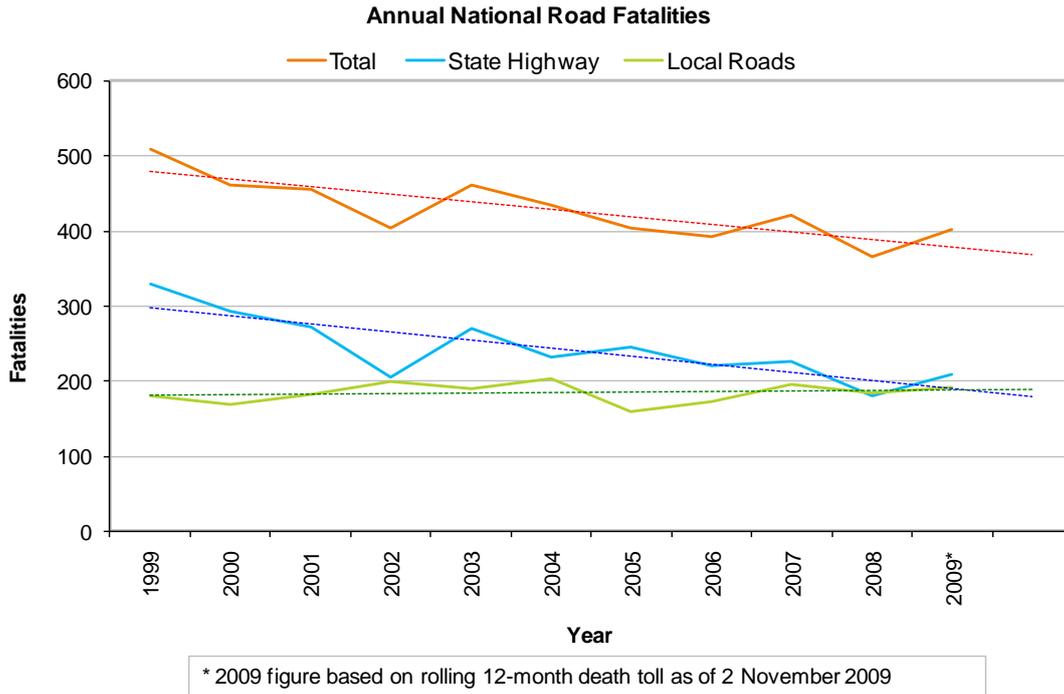
Existing construction activity is split between the State highway network and local roads. At least 10 percent of road construction and maintenance spending from the National Land Transport Programme (NLTP) is on safety projects.

There has been a considerable level of activity through the State highway construction and maintenance programme, and reductions in fatalities and social cost on the State highway network have occurred. Inflation-adjusted figures show total expenditure on the State highways construction and maintenance programme increased from \$670 million in 2002/03 to \$1,298 million in 2007/08.

By comparison, the local roads construction and maintenance programme has seen less activity and there has been little change in fatalities and social cost.

Overall, fatalities on the State highway network were reduced by about five percent, while the number of fatalities on local roads stayed about the same, as shown in the graph below. It was expected that the existing construction category would deliver a five percent reduction in social cost.

⁴ A Network Safety Coordination project involves a group of road safety partners working together to assess a high-risk section of road (ie a black spot) to determine the best mix of engineering, enforcement and education initiatives to lower the risk and improve crash outcomes.



Expanded Construction

The expanded construction category of road safety engineering was expected to deliver an 11.7 percent reduction in road safety cost. Examination of the NLTP indicates that the level of resourcing focused on safety benefits was lower than required to achieve the estimated outcomes under the expanded construction scenario.

In summary, the engineering activities that were undertaken in relation to black-spot treatments and existing construction probably delivered the results that were expected. However, the expanded level of construction necessary to reach the *Road Safety to 2010* targets required a level of resourcing that was beyond the amount allocated from the NLTP to safety improvements over the course of the strategy. This means the overall scale of activity was not sufficient to deliver the reduction in social cost expected from engineering interventions.

Speed management

Speed management is a key element of road safety strategies worldwide. This is because of the proven statistical relationship between speed and the number and severity of road crashes. Small reductions in overall mean speed greatly reduce both the frequency and severity of crashes that do occur⁵. This is true for all crashes – not just for those where speeding or going too fast for the conditions is the primary cause.

Speed can be managed by enforcement (police surveillance and speed cameras), education (advertising and raising awareness), and engineering (speed limits and road design). The *Road Safety to 2010* strategy contained a number of proposed interventions to manage speed. These included proposals to reduce speeds in urban

⁵ A good example of this relationship is seen in France. Following a step change in speed enforcement effort, the mean speed on French roads decreased by 5km/h between 2002 and 2005. Road deaths fell by 30 percent, three-quarters of which was credited to the drop in mean speeds.

areas, increase open road enforcement and introduce demerit points for speed camera offences. The expected reduction in total social cost from this intervention package was 16.9 percent.

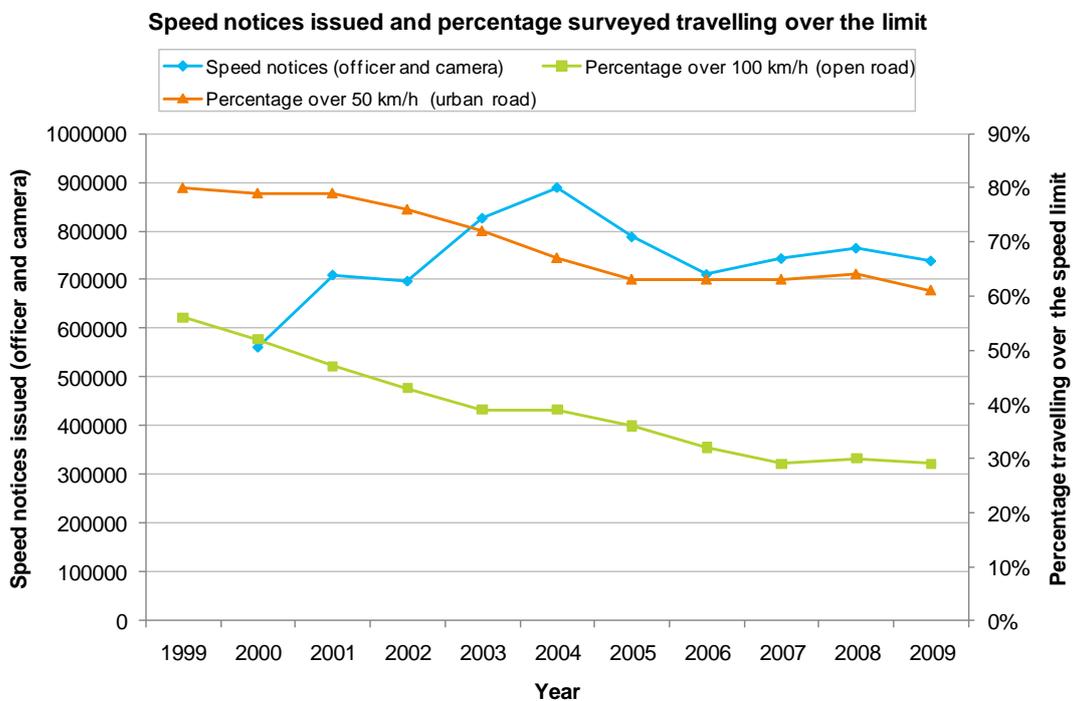
Two key components of the intervention package were to strengthen the effectiveness of police enforcement and speed-related advertising. At the end of 2000, a new Highway Patrol Group was established, with speed enforcement as its main area of focus.

The 2007 Duignan review of the 2010 strategy considered the effectiveness of speed enforcement. When taking into account the increase in the road policing programme over this period (adjusting for the increase in administration and personnel costs), the increase in police effort was estimated to be about 12 percent. The number of speeding tickets issued over the same period increased by 72 percent.

Funding for the police speed control has represented about a quarter of the total road policing programme budget across the period of the *Road Safety to 2010* strategy. Police expenditure on speed enforcement was also boosted by \$26.7 million for the Highway Patrol Group⁶.

The initial focus was targeting the extreme upper end of speeding. Since then, the focus has been to reduce mean speeds. This has meant targeting the mid-ranges of speeding, in particular those travelling between 11 and 20 km/h over the speed limit.

The graph below compares speeding infringements issued per year against the proportion of drivers exceeding the speed limit. It can be seen that as the number of tickets issued has increased, the proportion of drivers exceeding the speed limit has dropped. This further supports the conclusion in the Duignan report that the increase in enforcement activity has been effective in encouraging safer speeds.



⁶ Evaluation of the Road Safety Administration Programme (“Stocktake” Update), May 2007.

The increase in speed enforcement was accompanied by advertising. The advertising campaigns were aimed at increasing public support for speed management and changing the behaviour of dangerous drivers who put other road users at risk

Currently, the NZ Transport Agency (NZTA) invests \$3-3.5 million annually in advertising to support speed enforcement. The Accident Compensation Corporation (ACC) also delivers a nationally coordinated programme, *Drive to the Conditions*, which aims to reduce the number of crashes that occur at, or near, the speed limit and the seriousness of injuries from speed-related crashes.

Reviews have indicated that the combined enforcement and advertising programme has been shown to be effective in reducing mean speeds and consequently reducing speed-related road deaths. While it is difficult to separate the effectiveness of advertising and enforcement (as the two are designed to support each other), the 2004 Breen review concluded that the combination of police enforcement and publicity contributed to useful reductions in mean speeds⁷. Other reviews have reached similar conclusions⁸.

To support this effort, a number of legislative interventions were introduced as part of the second 2010 implementation package. These interventions included tougher enforcement of speed limits for high risk offenders (by reducing the threshold for mandatory and immediate 28-day licence suspension) and removing restrictions on the deployment of speed cameras (ie no longer constrained to sign posted areas) as part of the *Anytime, Anywhere* campaign. However, a key part of this package – introducing demerit points on speed camera offences – was not implemented.

The third implementation package, agreed to in December 2007, included rebalancing the penalties for speeding to make them a more effective deterrent. This means having more demerit points and smaller fines for speeding offences. A high proportion of New Zealand's unpaid fines are for traffic-related offences. These changes have not occurred.

Notes on the data used in the section below:

- *Speed-related crashes:* The New Zealand Police only note a crash was speed-related in the crash report if they believe it was a contributing factor in a crash.
- *Impact speed:* The impact speed at the time of the crash can only be accurately recorded for fatal crashes where a full crash analysis is completed. For the period 2003-2007, this was only recorded in 44 percent of fatal crashes.
- *Mean speeds:* Mean speeds are recorded at a representative selection of sites every year and provide a good indication of how mean speeds are changing over time.

Speed management over the past decade has made a major contribution to reducing speeds on both open and rural roads. The table below shows that the proportion of drivers travelling over 110 km/h on open roads reduced from 19 percent to 2.8

⁷ Review of the *Road Safety to 2010* strategy (November 2004), Jeanne Breen Consulting pp.58, 62-65.

⁸ Claridge, G. (August 2006). Review of the National Road Safety Advertising Programme, pp. 4-5.

percent and the proportion travelling over 60 km/h on urban roads reduced from 22 percent to 6.4 percent. The proportions of drivers travelling over 100 km/h on the open road and over 50 km/h on urban roads also reduced, although not as much.

The mean speed on both open roads (speed limit 100 km/h) and urban roads (speed limit 50 km/h) steadily decreased over the first half of the decade, as did the 85th percentile speeds (ie 15 percent of drivers travel faster than this speed). The 2010 targets for speed in the first half of the strategy were therefore achieved⁹. However, progress has slowed since 2005, notably in urban areas, where the mean speed is still above the 50km/h limit.

The table below¹⁰ (which is for light vehicles only) also indicates that the majority of speeding drivers travel between 0-10 km/h over the speed limit. Apart from heavy vehicle enforcement and school speed zones, the New Zealand Police generally do not issue tickets for speeding offences that are less than 10 km/h over the posted limit.

	Open road mean speed				Urban road mean speed			
	mean speed (km/h)	85th percentile (km/h)	% over 100 km/h	% over 110km/h	mean speed (km/h)	85th percentile (km/h)	% over 50km/h	% over 60km/h
2010 target for 2004 (km/h)	99				53			
1999	101.8	112	56%	19%	55.8	62.5	80%	22%
2000	101.1	111	52%	17%	55.3	62.0	79%	20%
2001	100.2	109	47%	13%	55.2	61.5	79%	19%
2002	99.1	107	43%	9%	54.3	60.5	76%	15%
2003	98.0	105	39%	6%	53.7	59.5	72%	12%
2004	97.8	105	39%	5%	52.9	58.0	67%	9.2%
2005	97.1	104	36%	4%	52.4	58.0	63%	7.8%
2006	96.4	103	32%	3.5%	52.6	58.0	63%	8.2%
2007	96.3	103	29%	3.5%	52.5	58.0	63%	7.9%
2008	96.6	103	30%	3.4%	52.6	58.0	64%	7.5%
2009	96.3	103	29%	2.8%	52.3	57.0	61%	6.4%

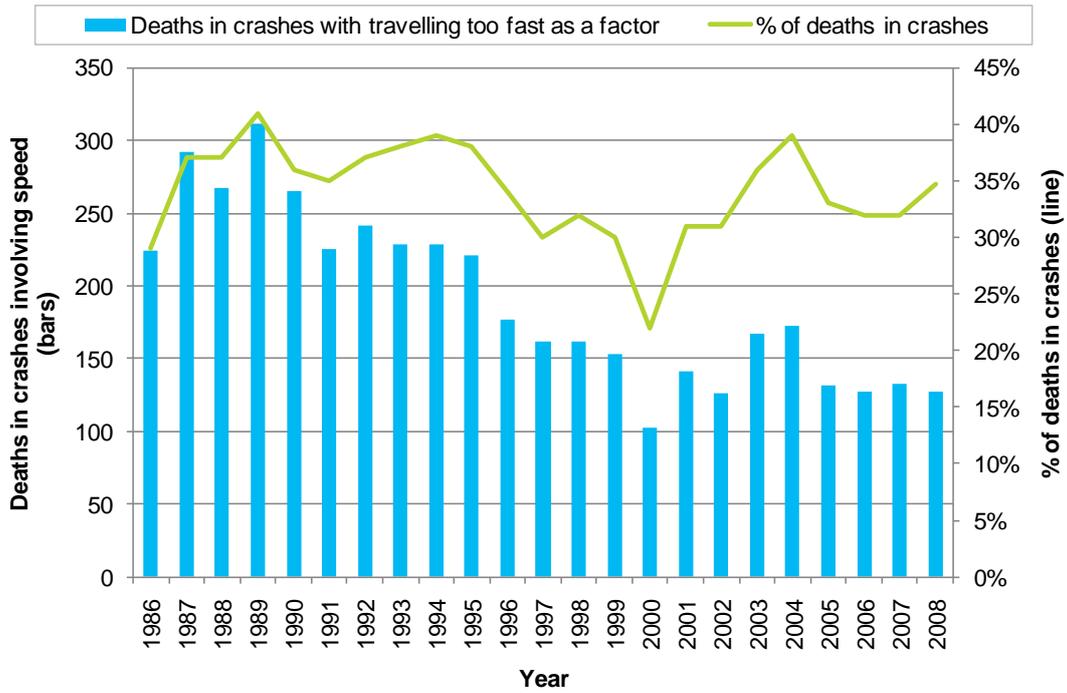
It is difficult to determine from the statistics the exact proportion of fatal and serious injury crashes where the driver was travelling too fast for the conditions and also exceeding the speed limit. Therefore, collecting accurate data is difficult. For the 44 percent of speed-related crashes where data is available, two-thirds of drivers who were travelling too fast for the conditions were also exceeding the posted speed limit. On open roads, 30 percent of speed-related crashes occurred when the driver was travelling between 100-104 km/h. However, there is a relatively high margin of error in this data.

⁹ The 2010 strategy did not include targets relating specifically to speed beyond those set for 2004.

¹⁰ Data for the table is from annual speed surveys, which provide a measure of driver's choice of travel speed by monitoring speeds of vehicles that are unimpeded by other traffic. More information and a summary of results for the most recent survey can be accessed from the Ministry of Transport website <http://www.transport.govt.nz/research/SpeedSurveys>.

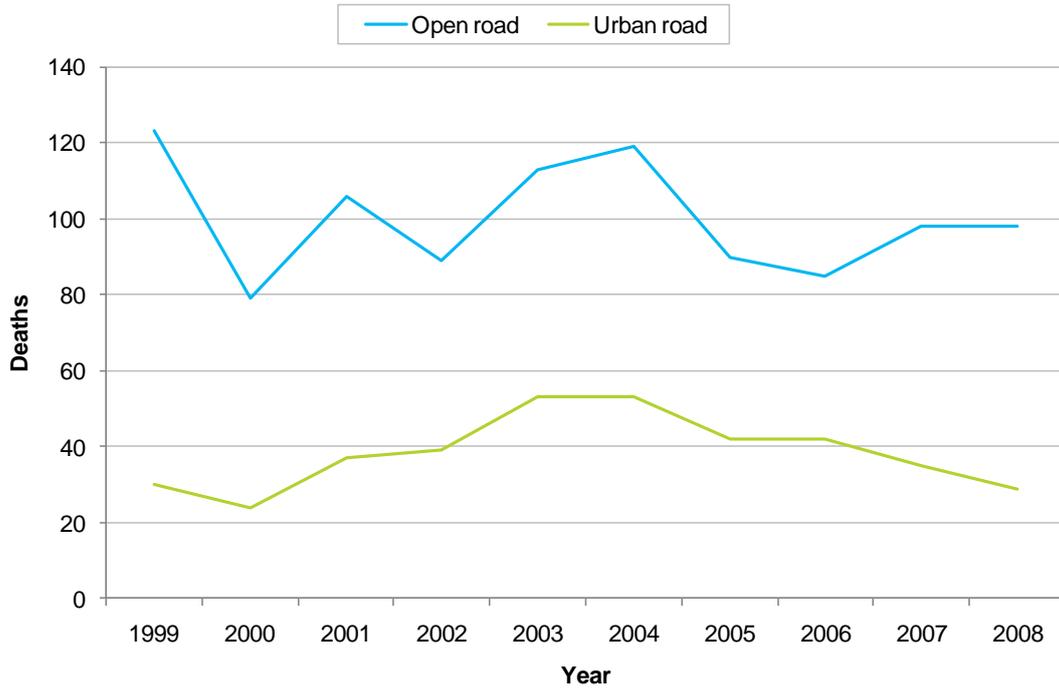
Speed-related deaths have trended downward over the last decade, as shown in the graph below. Overall, there has been a 15 percent reduction in speed-related deaths over the period of the 2010 strategy. This is a significant improvement as VKT has been increasing. However, the graph also shows that progress has been slower than in the 15-year period prior to the strategy.

Fatalities in crashes where people were travelling too fast for the conditions



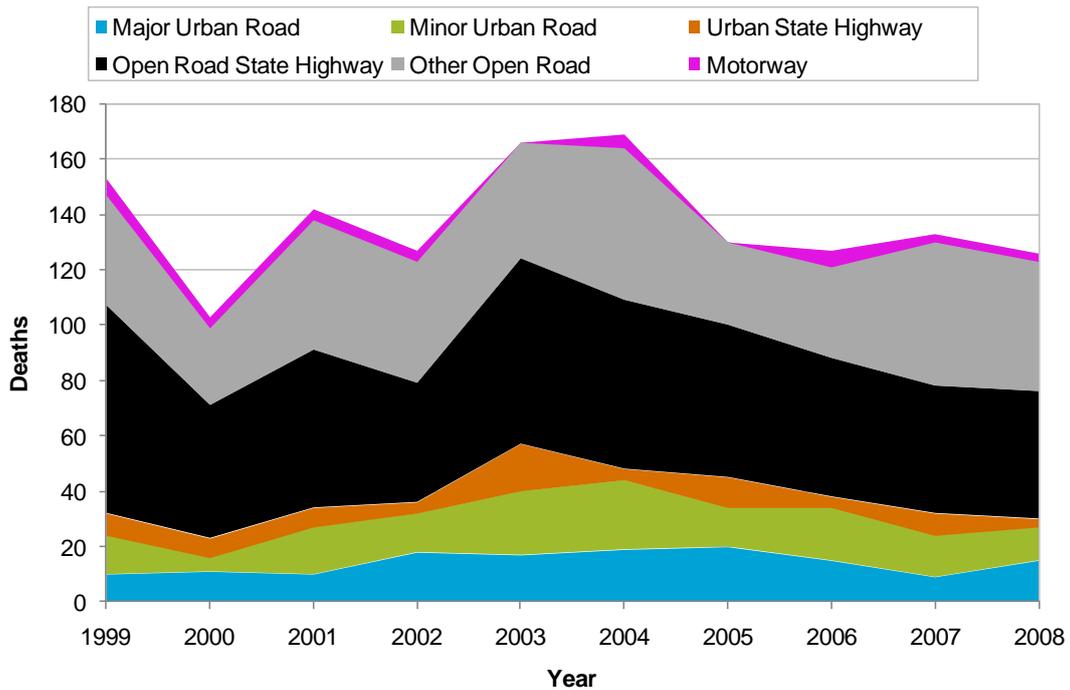
The top graph on page 19 shows that greater progress was made on open roads than on urban roads. This is probably because the mean speed on open roads dropped by more than it did on urban roads.

Deaths in crashes where travelling too fast for conditions was a contributing factor, by urban/open road breakdown

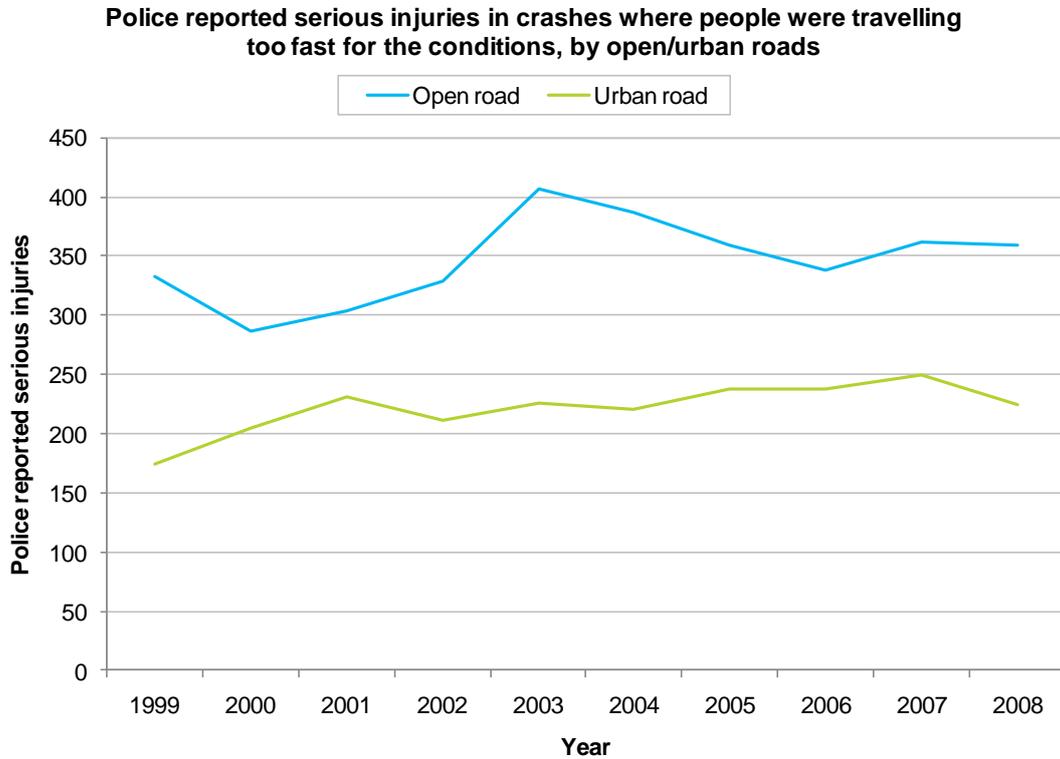


This data can be broken down further, as shown below. Most progress in reducing speed-related deaths on open roads occurred on open road State highways. This is probably because of the greater investment in road engineering improvements on State highways and the introduction of the New Zealand Police highway patrols.

Deaths in crashes where travelling too fast for conditions is a contributing factor, by road type



The trend for serious injuries in speed-related crashes shows a different pattern. It can be seen that while deaths have decreased, serious injuries have increased slightly.



Overall the intended package of 2010 speed initiatives was only partly implemented. While the increase in police enforcement effort occurred, it was not backed up by the proposed changes to the penalties, in particular demerit points.

However, there has been improved speed compliance over the past decade, with lower mean speeds and less people driving over 110 km/h. Progress has been greater on open roads, particularly open road State highways. The majority of light vehicle drivers still speed in urban areas and the mean urban speed remains above the 50 km/h limit.

Between 2000 and 2008, the open road mean speed reduced by nearly five km/h. Given this change, an 18 percent decline in total road crash fatalities was expected. As stated earlier, the expected result at the end of 2009 is about 12 percent.

In summary, some gains have been made as a result of initiatives to address speed, but the overall effect on total road deaths was less than expected. This could be because of insufficient progress in other parts of the strategy, which has contributed to the lower gains made overall. For example, lack of progress in reducing the incidence of drink-driving and insufficient progress in improving roads.

Light vehicle fleet

Improvements in the light vehicle¹¹ fleet were predicted to reduce social cost by 15.5 percent. This was to be achieved through improvements in the crashworthiness of

¹¹ A light vehicle covers all passenger vehicles and all light goods vehicles with a gross vehicle mass under 3,500 kg. This includes passenger cars, vans, four wheel drives and utes.

new vehicles (where crashworthiness measures the risk of a driver being seriously injured in the event of a crash). The 2010 forecast was revised in 2005¹² to a 22 percent reduction in total social cost as more accurate predictions of crashworthiness improvements in the New Zealand light vehicle fleet became available.

Actions to improve light vehicle safety over the last decade included improvements to vehicle standards, raising public awareness and developing a consumer safety focus. The consumer safety focus has been strongest in the last two years and covers:

- the 'Right Car' website, developed by the NZTA, which provides information to prospective car buyers about vehicle safety features as well as other characteristics, such as fuel efficiency
- provision of information on new car crash test results (through the ANCAP¹³ crash testing programme) and on used car safety ratings
- a vehicle safety technology campaign – a partnership between NZTA and ACC that began in mid-2007 – which focuses on encouraging the uptake of vehicles with electronic stability control and side curtain airbags
- Future Fleet road shows, which aim to encourage fleet buyers to purchase safe and sustainable vehicles
- development of vehicle procurement guidelines for government departments, which mandate the purchase, lease and/or hire of at least four-star safety-rated vehicles (as rated by ANCAP).

The Monash University Accident Research Centre (MUARC), a world-leading research institute in vehicle safety, provided the estimates of the change in crashworthiness for the New Zealand fleet. The impact of changes in crashworthiness of the vehicle fleet is estimated through evaluation of the outcomes of thousands of actual crashes in Australia and New Zealand.

The MUARC analysis of light vehicle safety in New Zealand has shown that, since the mid-1980s, there has been a 55 percent reduction in the risk of death or serious injury to drivers involved in a crash. During this period vehicle safety in New Zealand was affected by several competing effects:

- a general increase in the safety features in vehicles
- increasing proportions of used imported vehicles entering the New Zealand fleet
- increases in the regulation of vehicle safety standards¹⁴.

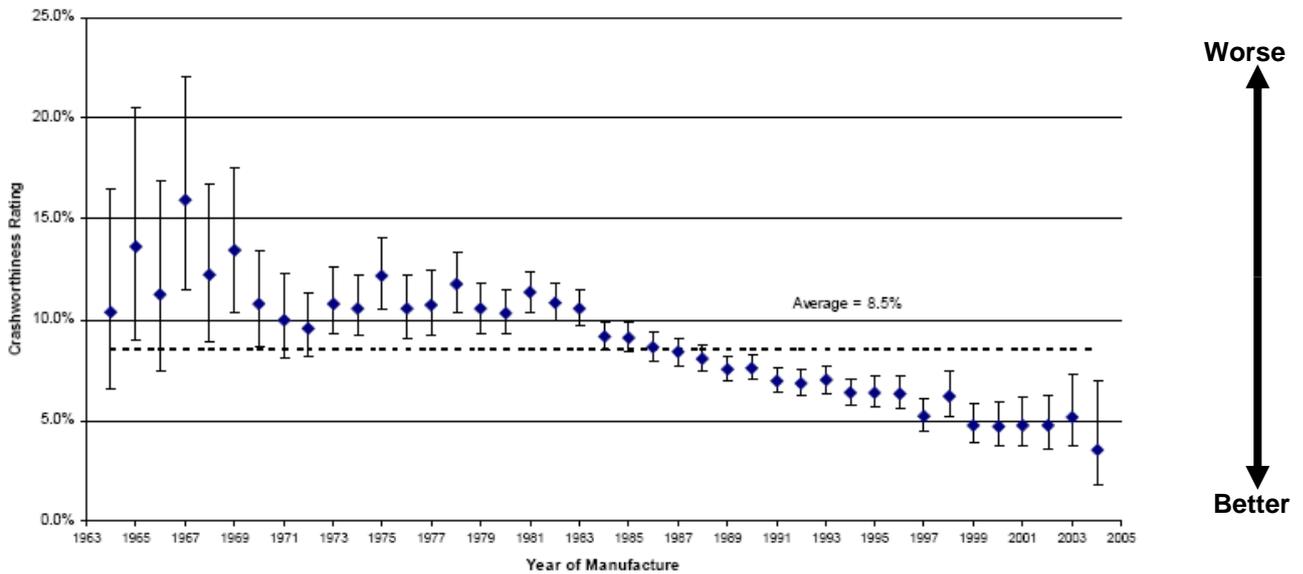
Crashworthiness improvements by year of manufacture are shown in the graph on the next page.

¹² Keall, M.D., Newstead, S.V., and Scully, J. *Projecting effects of improvements in passive safety of the New Zealand light vehicle fleet to 2010*, Monash University Accident Research Centre, August 2005.

¹³ Australian New Car Assessment Programme

¹⁴ Newstead et al., *Trends in crashworthiness of the NZ vehicle fleet by year of manufacture: 1964-2006*, supplement to report 280, 2008.

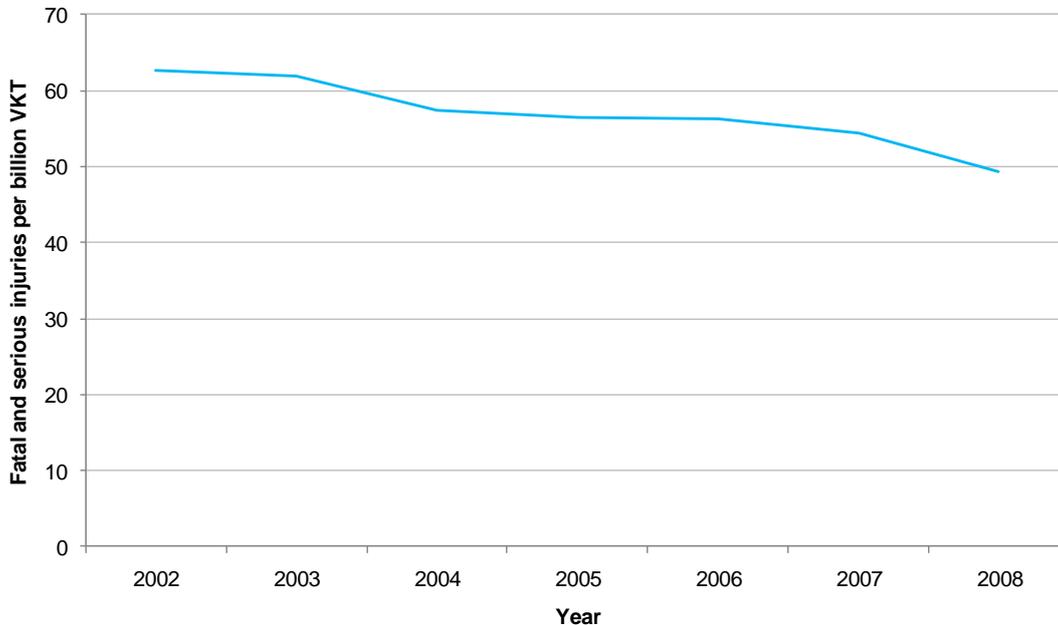
Crashworthiness by year of manufacture (with 95 percent confidence limits) for all vehicles (both new vehicles and used imports)¹⁵



A more recent MUARC study estimated that improvements in the crashworthiness of the New Zealand light vehicle fleet resulted in about 1,900 lives being saved over the period from 1991 to 2006¹⁶.

The fatal and serious injuries suffered by light vehicle occupants in crashes from 2002 to 2008 shows a downward trend, as shown in the graph below.

Deaths and serious injuries in light vehicle crashes per billion vehicle kilometres travelled (VKT)



¹⁵ Newstead et al., *Vehicle safety ratings 2006 update*, report 248, 2006

¹⁶ Newstead, S., and Scully, J. *Estimation of the effect of improved average secondary safety of the passenger vehicle fleet on annual counts of serious injury for Australia and New Zealand: 1991-2006*, Monash University Accident Research Centre, September 2009.

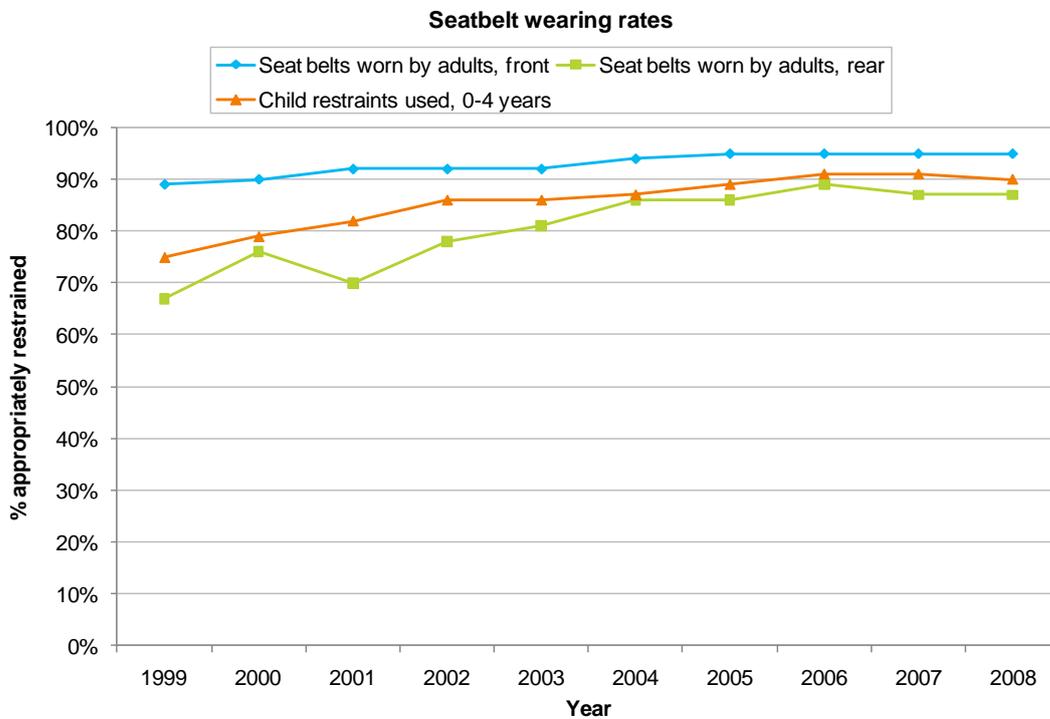
While the reductions in fatal and serious injuries are of the order expected from the MUARC estimates of improved vehicle crashworthiness, it is not possible to separate the effect of vehicle improvements from activity in other areas such as improvements to roads and reductions in speed.

Overall indications are that improvements in the vehicle fleet have had a positive effect on road safety.

Increased compliance – restraint wearing

The 2010 strategy identified increasing the enforcement focus on restraint wearing as an intervention that would improve road safety. It was expected that increased enforcement would result in a total social cost reduction of 4.2 percent.

Restraint wearing rates have steadily improved over the period of the *Road Safety to 2010* strategy. The target set was to achieve a 98 percent restraint wearing rate, leading to an expected social cost reduction of 4.2 percent. In 2009, the seatbelt wearing rate for drivers and adult front seat passengers was 95 percent.



The 2004 Breen review of the strategy quoted new research showing that the effectiveness of restraints in reducing fatal injury is much higher (61 percent rather than 40) than the estimate used to forecast the expected social cost reduction, and even more so when combined with air bags.

The Breen review found that the combination of police enforcement and advertising to encourage restraint use had been highly successful at both a national and a regional level. The review also found that the 2004 level of enforcement and advertising efforts would need to be maintained in order to reach 2010 targets.

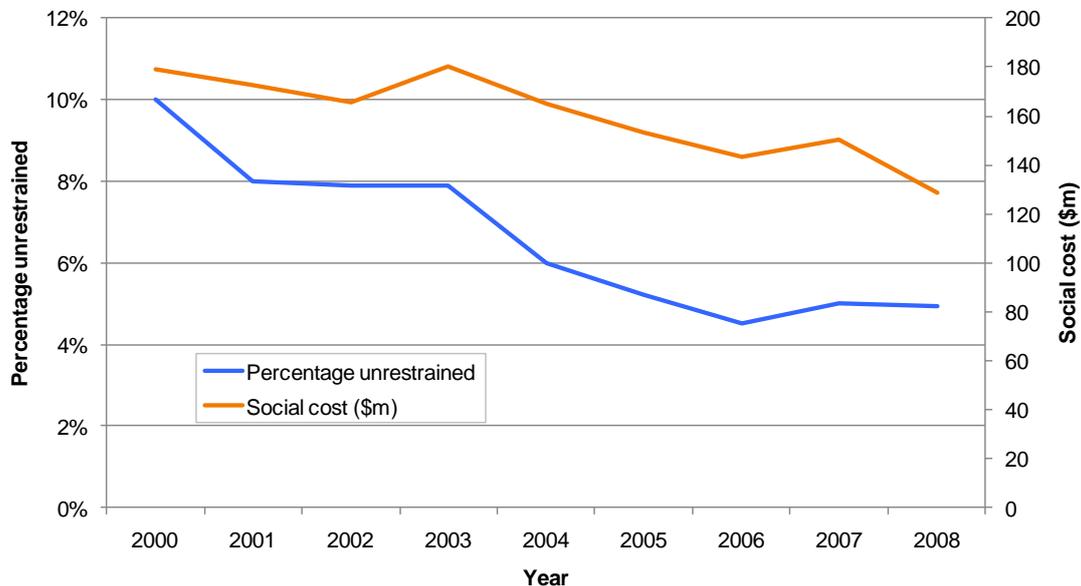
Information from the New Zealand Police shows there has been a significant increase in efforts around restraint enforcement, particularly in the first half of the decade. Between 1999/2000 and 2004/2005, the number of non-wearing offences increased by more than 100 percent.

The third implementation package made restraint compliance a particular focus, and included a proposal to rebalance the penalty for non-wearing offences, so that they attract a fine of \$50 and 25 demerit points, rather than a \$150 fine. However, this change has yet to be implemented.

Additionally, the 2008 Public Attitudes to Road Safety survey found that 95 percent of respondents agreed that restraints (including child restraints) are effective in reducing the road toll. Eighty-seven percent agreed that enforcing the use of restraints helps lower the road toll; this level of agreement has been steady over the last decade.

While not wearing a restraint does not cause a crash, it does have a significant impact on the scale of injuries sustained and whether the injuries are fatal. The graph below shows the social cost of unrestrained vehicle occupant casualties over recent years.

Social cost of unrestrained vehicle occupant casualties



The target of a 98 percent wearing rate is not likely to be achieved. However, the Breen review noted new research showing greater effectiveness of restraints in reducing fatal injury. It is therefore expected that the total social cost reduction through the increased restraint usage would be about, or slightly less, than forecast.

Interventions targeting drink-driving

In the area of drink-driving, the 2010 strategy identified six interventions to reduce the number of people killed and seriously injured by drink-drivers. These were to:

- reduce the adult drink-drive limit to a blood alcohol content (BAC) of 0.05 (estimated 4.5 percent reduction in social cost)
- increase the number of compulsory breath testing operations (estimated 3.3 percent reduction in social cost)
- introduce licence suspension (estimated 1.5 percent reduction in social cost)
- introduce vehicle impoundment (estimated 1.9 percent reduction in social cost)

- introduce mandatory alcohol interlocks¹⁷ for repeat offenders (estimated 0.6 percent reduction in social cost)
- reduce the blood alcohol limit to zero for young drivers (estimated 0.1 percent reduction in social cost).

Reducing the drink-drive limits for adults and youth

Reducing the blood alcohol limit for adults from 80mg/100ml to 50mg/100ml, along with a zero limit for drivers under 20 years, was proposed in the second implementation package in 2004 but not progressed.

While not a stated intervention in the 2010 strategy, the second implementation package also proposed the introduction of an offence for drug-impaired driving. The Land Transport Amendment Act 2009, in force since 1 November 2009, made it an offence for a driver to be impaired by drugs.

Increased compulsory breath testing

Highly visible breath testing activity increases the public perception that they will be caught if drink-driving. Total breath tests (both compulsory and mobile breath testing) increased by 77 percent over the period of the 2010 strategy, from 1.78 million tests in 1999/2000 to 3.16 million tests in 2008/09.

Licence suspension and vehicle impoundment

An immediate licence suspension for 28 days is applied when a person is found to be driving with a very high blood alcohol content. The second implementation package proposed that the threshold for licence suspension be lowered from 160mg/100ml to 130mg/100ml, and that immediate licence suspension should apply for the second drink-drive offence within four years. These changes have been made.

Vehicle impoundment for the third, or subsequent, drink-drive offence in four years was also introduced as part of the second 2010 implementation package in 2004.

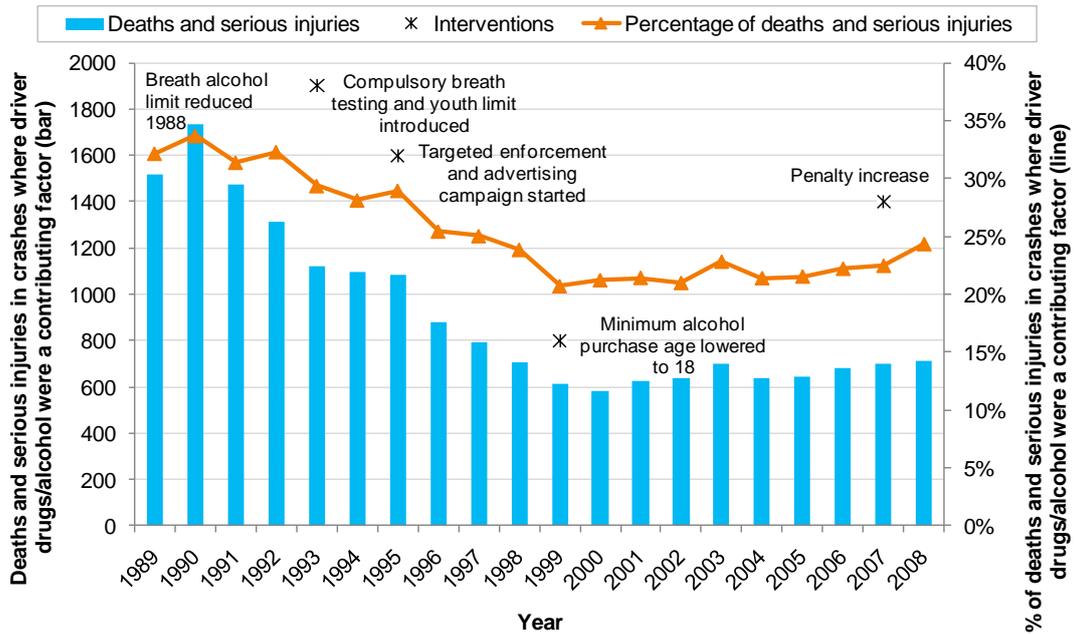
Mandatory alcohol interlocks for repeat offenders

The initiative to introduce mandatory alcohol interlocks for repeat offenders was not progressed.

The three alcohol interventions introduced were estimated to result in a 6.7 percent reduction in social cost. However, as can be seen from the graph on page 26 the number of fatalities and serious injuries in crashes where alcohol or drugs were a contributing factor has not changed significantly since about 2000. The number of serious injuries has in fact increased from 473 in 2000 to 572 in 2008.

¹⁷ An alcohol interlock is an electronic device installed in a vehicle that requires a driver to provide a low or alcohol-free breath sample before the vehicle will start.

Police-reported deaths and serious injuries in crashes where driver drugs/alcohol was a contributing factor

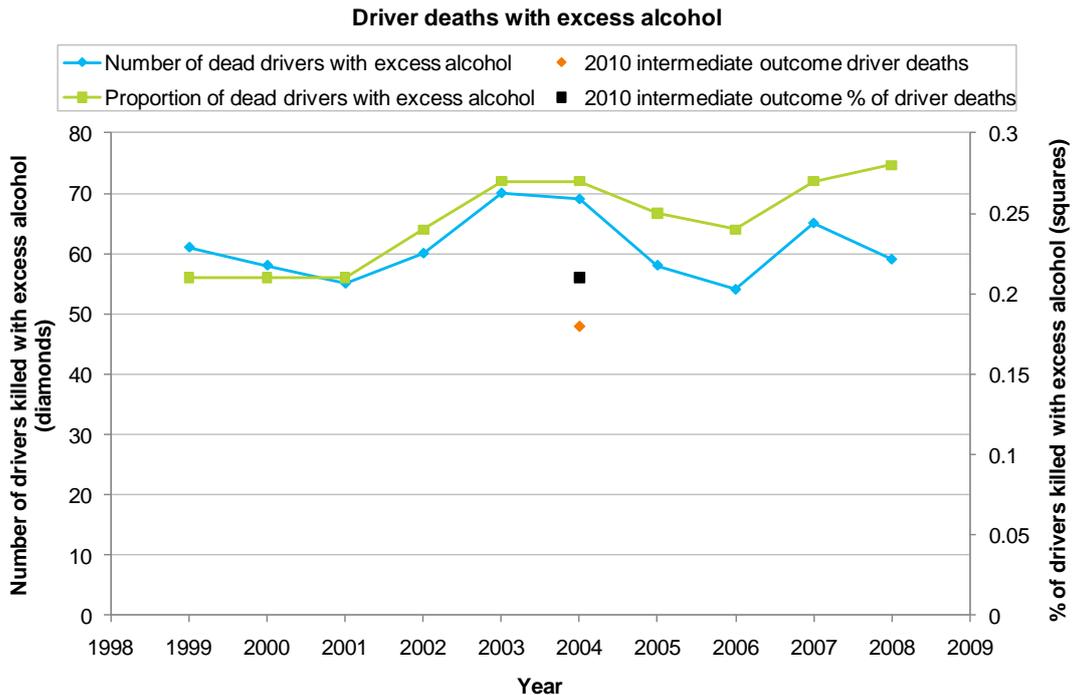


By contrast, much stronger progress was achieved prior to 2000. This partly reflects the lowering of the legal breath alcohol limit in 1988, the introduction of compulsory breath testing and lower youth limit in 1993, and the targeted advertising and enforcement campaign started in 1995.

Data allowing comparisons with Australia is incomplete and the Ministry of Transport has been advised by Australian officials that their national statistics for 2007 and 2008 will not be available until February 2010. However, based on the Australian results for 2006, around 22 Australians die in alcohol-related road crashes per one million population. This compares with 28 New Zealanders per one million population in 2008. The limited state data shows that, in Victoria, 16 Australians die per one million population and, in Western Australia, 19 Australians die per one million.

As a proportion of all drivers killed in road crashes, there has been an increase in the number of drivers killed with excess blood alcohol levels, as shown in the graph on page 27. It is important to note that this graph shows the minimum proportion of drivers killed who may have been impaired by alcohol, as not all deceased drivers are tested for their blood alcohol levels.

As indicated by the black square, the intermediate target has not been achieved. It is highly unlikely that the final target will be achieved.



While it is sometimes believed that recidivist drink-driving offenders cause the greatest proportion of crashes involving alcohol/drugs, analysis of the crash involvement of drink-driving offenders does not support this view. Typically over 70 percent of drivers involved in alcohol-related crashes are not recidivist drink-driving offenders (ie drivers who have had no drink-driving convictions in the prior five years).

The following information is based on a Ministry of Transport analysis of drivers involved in police-reported casualty crashes in 2003 and 2004¹⁸, which has been linked to information from the Driver Licence Registry on licence holders' drink-driving offence history. This analysis was limited to an examination of drink-driving offences in the five years prior to a crash. A five-year timeframe was used as this corresponds to the criteria for repeat drink-driving offenders in section 65 of the Land Transport Act 1998.

Of the drivers involved in any alcohol-related injury (fatal or non-fatal) crashes:

- 72 percent had no drink-driving offence history in the five years prior to the crash
- 21 percent had one drink-driving offence in the five years prior to the crash
- 7 percent had two or more drink-driving offences in the five years prior to the crash.

Of the drivers involved in fatal, alcohol-related crashes only:

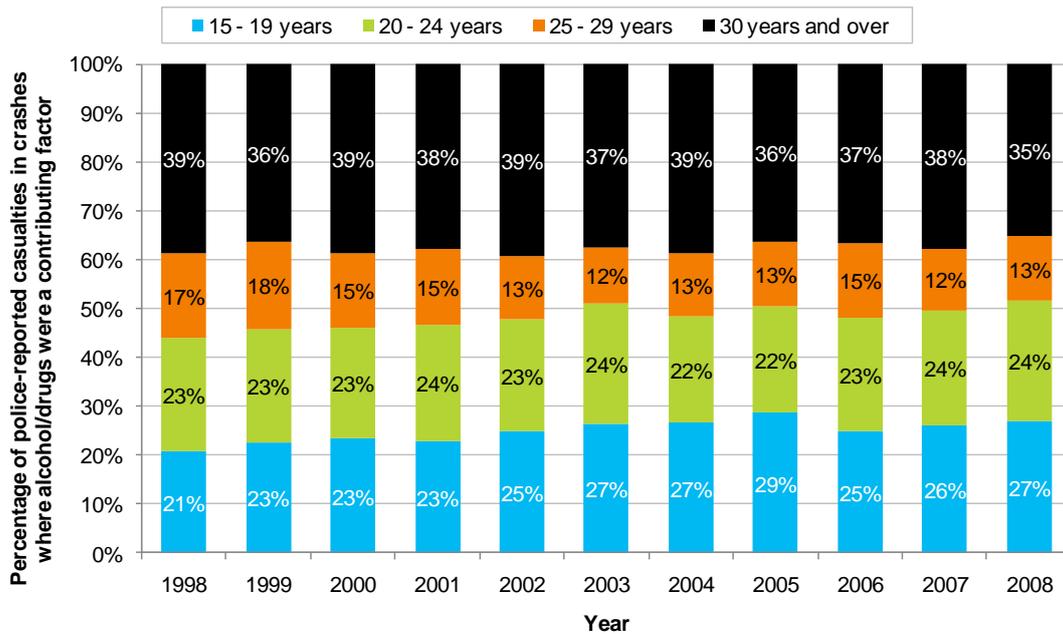
- 73 percent had no drink-driving offence history in the five years prior to the crash
- 21 percent had one drink-driving offence in the five years prior to the crash

¹⁸ The Ministry of Transport is currently repeating this analysis, including using a range of prior offending timeframes. Results for 2007 and 2008 will be available by the end of 2009.

- 7 percent had two or more-drink driving offences in the five years prior to the crash.

In 2008, 64 percent of drivers at fault in alcohol-related crashes were under the age of 30 years and 27 percent were aged 15-19 years. Since 2000, there has been a slight increase in the proportion of drivers aged under 30 years involved in drink-drive crashes.

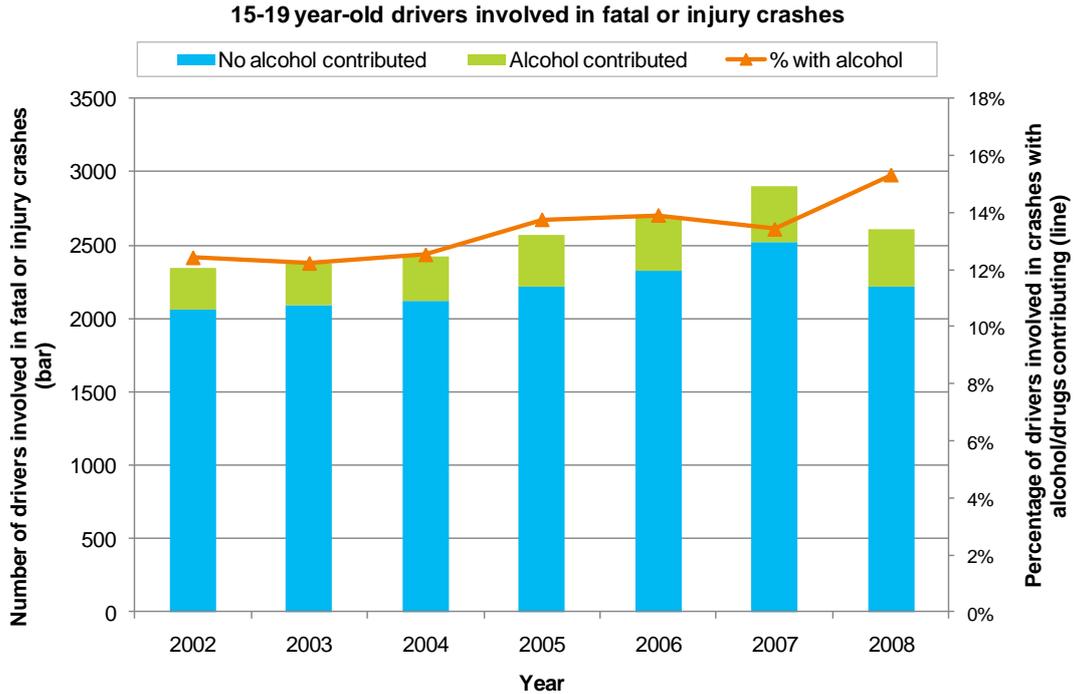
Percentage of police-reported casualties in crashes where alcohol/drugs were a contributing factor, by age of at-fault driver



However, the three *Road Safety to 2010* interventions (discussed previously on page 25) probably had an impact on reducing the incidence of drink-driving. Two further factors are likely to have put pressure on the outcomes achieved since 2000. These are the:

- population growth in the 15-19 year-old age group, which has resulted in a greater number of young drivers in 2008 than there were in 2001
- reduction in the minimum purchase age for alcohol from 20 to 18 years in December 1999. Some of the predicted gains may not have been realised because of young drivers having increased access to alcohol.

Some evidence of these impacts can be seen from the graph above with 15-19 year-olds making up a higher proportion of drivers involved in alcohol crashes in 2008 than in 2000. Both the number of young drink-drivers involved in a crash and the rate of involvement has increased over the period of the strategy, as shown in the graph below. The trend can especially be seen in the significant increase in the percentage of young drivers involved in crashes with alcohol or drugs as a factor since 2004.

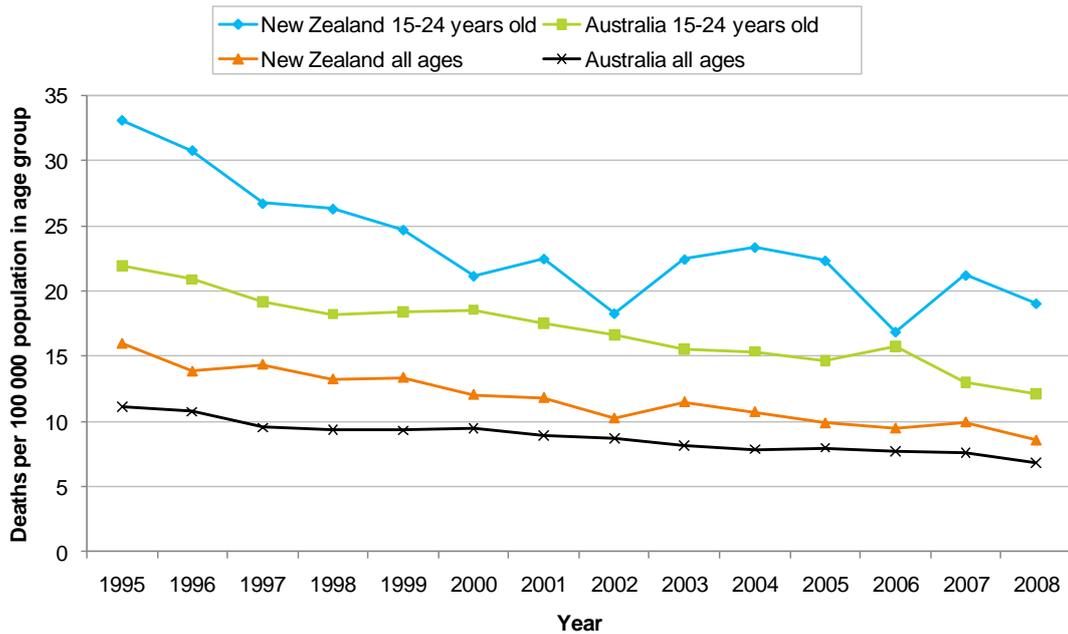


Young drivers

The *Road Safety to 2010* consultation document did not estimate any significant social cost gain from interventions targeted at young drivers (aged 15-24 years). However, ongoing activity relating to young drivers has continued through the strategy period, particularly in education directed at young people learning to drive, and through school programmes about being responsible road users – as pedestrians, cyclists and passengers.

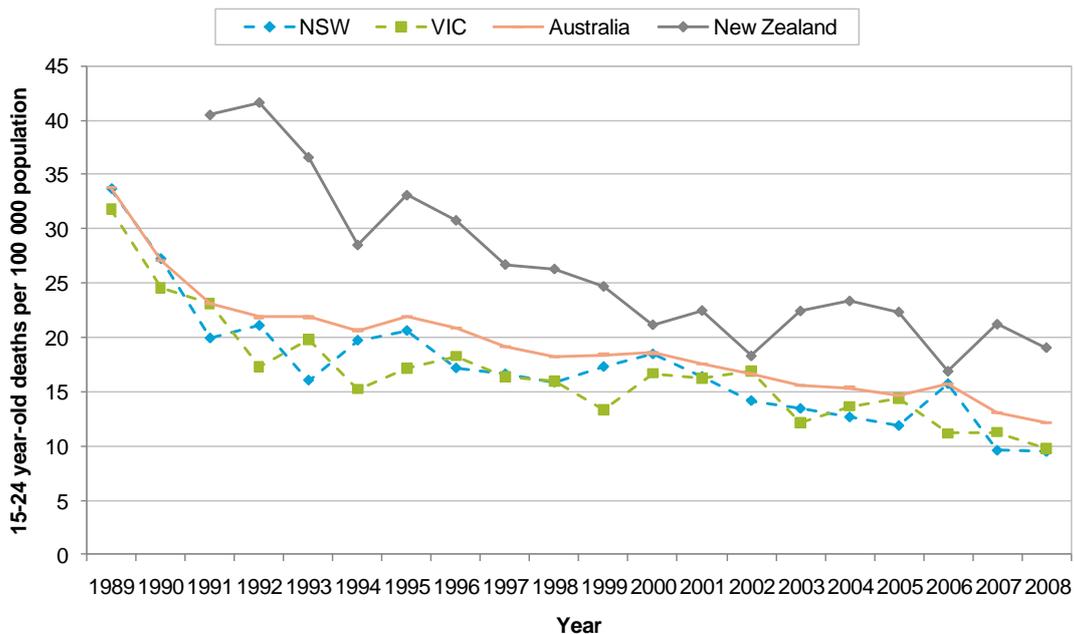
Young drivers are particularly at risk while driving. This is due to a number of factors including their young age, maturity, inexperience and risk-taking. Young drivers are typically over-represented in road fatality and serious injury statistics. This is the case in comparable countries. However, their fatality rates per 100,000 are typically much lower than in New Zealand. For example, in Australia the fatality rate for 15-24 years olds is about 13 per 100,000 population. In New Zealand, it is about 20 per 100,000 population. The fatality rates for young drivers, as well as the whole population, can be seen for both Australia and New Zealand in the graph below.

Deaths per 100 000 population for 15-25 year old road users and for all ages for Australia and New Zealand



In most states in Australia, the minimum learner licence age is 16 years, and the minimum age for a probationary licence (equivalent to the New Zealand restricted licence) ranges from 16 to 18 years (in the majority of states it is 17 years). Most states also have a minimum age of 20 years for obtaining a full licence. In the Northern Territory it is 18.5 years and in Victoria it is 21 years. New South Wales and Victoria have particularly good outcomes for young drivers, as shown in the graph below.

15-24 year-old road user deaths per 100 000 population for selected Australian states and New Zealand



The New South Wales and Victoria Graduated Driver Licence Systems (GDLS) follow the best practice principles of a higher driving age and a longer learner licence period. Both states have a driving age of 16 years, at which point the driver can learn to drive with an experienced supervisor. The minimum solo driving ages are 17 and 18 years respectively. Other countries with particularly good road safety outcomes for young drivers include Sweden and Great Britain, with minimum driving ages of 16 and 17 years respectively.

The third implementation package of the *Road Safety to 2010* strategy had a focus on young drivers, with a range of interventions proposed such as raising the minimum driving age. It was also agreed to extend the learner period for a young driver or motorcycle rider, introduce 'licence compliance orders'¹⁹, and increase demerit points and lower fines for young drivers who breached their licence conditions. The latter intervention has been included in the Land Transport (Enforcement Powers) Act 2009, while the other interventions have not been progressed.

Education and public awareness

The *Road Safety to 2010* consultation document identified education as an intervention to be undertaken, but the size of social cost reduction expected from education was not estimated. This is because much educational effort is done as part of other interventions, such as supporting enforcement efforts.

Other educational activities undertaken include public advertising, and programmes focused on a range of different audiences, such as young drivers, older drivers, motorcyclists and school children. Education interventions were featured in all three implementation packages.

Efficiency gain

It was expected that most, if not all, interventions introduced would become more efficient over time, as a result of better targeting and allocation of resources. It was forecast that over the period of the *Road Safety to 2010* strategy, efficiency gains would cumulatively deliver a nine percent social cost reduction.

However, restructures in the sector in 2004 and 2008 resulted in interruptions in leadership and sector knowledge/expertise, and slowed progress in delivering interventions.

In summary, it is expected that there will have been a limited achievement of any efficiency gains.

¹⁹ In the case of repeated GDLS offences within a short period of time (eg in the same night), licence compliance orders would allow New Zealand Police to impound an offender's vehicle, rather than issue a second infringement notice.

Why has progress not met expectations?

The report indicates four possible factors that may have contributed to the targets not being met. As a result, overall targets for the level of fatalities and serious injuries will not be met.

- Some legislative changes, which were expected to reduce social cost, were not progressed. Proposals such as lowering the blood alcohol limit and introducing demerit points on speed camera offences were not adopted by the government. Legislative changes included in the third implementation package were, in large part, not implemented.
- The social cost reductions expected from engineering interventions were not achieved. This is mainly because the actual level of investment was lower than anticipated. The level of resource needed was not allocated, given priorities within the NLTP at the time. Increased focus on other priority areas, such as Auckland transport and public transport, hindered ability to gain the necessary resourcing.
- There has not been a significant reduction in alcohol/drug related crashes over the last 10 years, despite highly visible enforcement and an increase in the number of breath tests administered. The area of alcohol/drug-related crashes is one where the amount of progress expected was clearly not achieved. The increasing rate of youth alcohol-related crashes is also a concern.
- The estimated efficiency gains were not achieved, possibly because mergers in the transport sector have had an impact on the road safety focus.