SAFE ROADS AND ROADSIDES

OUR 2020 GOALS

Our long-term goal is to improve the safety of our roads and roadsides to significantly reduce the likelihood of crashes occurring and to minimise the consequences of those crashes that do occur.

WHAT IS THE PROBLEM?

- Road improvements contributed to an estimated 11 percent drop in rural road deaths and an estimated 15.8 percent drop in urban road deaths between 1997 and 2005, but we can do much more.
- Head-on crashes account for 23 percent of all fatal crashes. Yet over 90 percent of them could be avoided by having a median barrier.
- Loss of control contributes to 40 percent of all fatal crashes. These crashes would be less severe if there were median barriers present and roadside objects were protected or removed.
- 21 percent of our fatal crashes occur at intersections (this figure includes some of the above types of crashes). These crashes can be prevented by using methods such as skid-resistant road surfaces and traffic calming.

New Zealand's roads are not as safe as those in other countries. Our road network is comparatively long, with much of it built when we had fewer vehicles travelling at lower speeds. Our geography is challenging, and our population base is small. This means it is difficult to spend the same amount per kilometre of road as the best-performing countries.

Our network is also highly variable. For example, a straight two-lane divided road and a narrow, twisty, single-lane undivided road may both be called State highways. They may both have a 100 km/h speed limit, but the former is much safer.

From 1999–2008, safety on State highways improved at a greater rate than other roads. The government has built on this with increased new investment in State highways over the next ten years. While much of this investment aims to improve capacity, safety features are an integral part of the improvements. In addition, there has been new investment specifically aimed at improving safety (eg the 2009 Budget funds an extra 750 km of rumble strips).

However, there is still room for further improvement. A key challenge over the next decade will be to find ways to cost-effectively improve other roads that have high crash rates.

Many of our roads fall short of the safety standards we need. We also know that investment in roads and roadsides will support the other priority areas. Road engineering improvements are not cheap and need to be maintained, but they are effective and last a long time. The issue is how much we can do, given resources and competing priorities.

WHAT WE WANT TO ACHIEVE

We will work to improve our roads so that each type of road will eventually have a recognisable and distinctive set of self-explaining features such as signage, lane width, road markings and speed limits. This work will ensure roads are predictable, so that road users can expect particular safety features on each type of road. This should encourage people to travel at speeds that best fit the design and function of the road.

We will also work to make roads forgiving, so that they help to reduce the consequences of those crashes that do occur. We will do this through installing median barriers and removing or protecting roadside objects in known black spot areas.

It will take time for these improvements to be implemented across the road network. Many roads of similar function and speed vary significantly in layout and appearance, which is not helpful to the road user. The initiatives in this section are the first steps to make these improvements a standard part of our network as upgrades take place.

The actions in this section focus on reducing the most common types of crashes on the road network in both rural and urban areas. Most of these actions will involve applying a combination of proven engineering methods where they can be most effective; building on existing risk assessment methods, such as KiwiRAP, which assigns star ratings to roads based on their level of risk. In addition, we will continue to look for innovative assessment methods to help us to achieve the long-term goal of establishing a distinctive roading hierarchy. We also propose changes to the give way rules to reduce crashes at intersections, and we address the need to integrate transport planning with land-use planning.

WHAT ACTIONS CAN WE TAKE?

- Develop a classification system for the roading network.
- Focus safety improvement programmes on high risk rural roads.
- Focus safety improvement programmes at high risk urban intersections.
- Change the give way rules for turning traffic.
- Implement targeted treatments on popular motorcycle routes.
- Develop and support new approaches to safety on mixed-use urban arterials.
- Strengthen techniques to integrate safety into land-use planning.

Develop a classification system for the roading network

Some of the best-performing road safety countries have developed a classification system for their roads. They have consistent safety engineering design standards for each type of road based on its level of use and its intended function. This enables them to better identify the safety treatments required on a particular type of road.

The overall aim of a classification system is to help drivers by making roads predictable, fit for purpose and forgiving of mistakes. The speed limits also reflect this classification. We do not yet have such a system.

Developing a classification system for New Zealand's roads based on the above principles is a priority for this strategy. Work is already underway to develop the Roads of National Significance (RoNS), which are at the top of the hierarchy. Given their importance, these roads will need to be engineered to a high level of safety.

Focus safety improvement programmes on high risk rural roads

Many high volume rural roads have known crash problems. We intend to focus on run-off road[7] and head-on crashes as they are the most common crash types. We will initially target highest risk rural roads – those that carry over 15,000 vehicles per day[8], in particular the RoNS. A road with 15,000 vehicles per day has roughly five head-on crashes per 10 km every five years. Some New Zealand roads carry 15,000 – 20,000 vehicles per day but do not have median barriers. Installing median barriers[9] on all high risk high volume rural roads is estimated to save 8 to 10 lives per year and 102 to 119 injuries per year. This is a social cost saving of $42 to $52 million per year[10].

CASE STUDY

SH2 KATIKATI TO BETHLEHEM (27 KM)

The problem

High-use road with a poor crash record - dubbed the 'horror highway'.

3.4 fatal crashes and five serious injury crashes per year prior to treatment.

The solutions

2001 Intersections, signs and road markings upgraded. Education campaigns and targeted enforcement.

2004 Rumble strips installed.

2005 90 km/h speed zone installed over partial length of the road.

Post-treatment 1.1 fatal crashes (down 66 percent) and 4.4 serious injury crashes (down 11 percent) per year.

Median barrier treatments will prevent many head-on crashes. We also want to address run-off road crashes. The underlying causes of run-off road crashes are excessive speed, alcohol, failure to drive to the conditions, fatigue and distraction. Half of all rural crashes and 28 percent of urban crashes involve a roadside object, such as a power pole.

We intend to use engineering methods, such as improved line markings and warning devices, to help reduce run-off road crashes by signalling to drivers the appropriate speed to travel. Other techniques could include skid resistant surface treatments, widening or sealing road shoulders, electronic warning devices, and installing rumble strips and guard rails.

Collisions with roadside objects such as trees and power poles can have devastating impacts even at relatively low speeds. We intend to continue protecting or removing roadside objects to reduce the chances of run-off road crashes resulting in death and serious injury.

To reduce head-on and overtaking crashes, this initiative would apply a combination of lower-cost measures such as rumble strips applied across the network, higher-cost measures such as median barriers at targeted high risk locations, passing lanes, intersection improvements and other proven treatments. Rumble strips help to prevent crashes caused by distraction or fatigue.

7 These are crashes where the driver loses control and the vehicle leaves the road.
8 The KiwiRAP programme's star rating results, due out in 2010, will be used to help identify where we need to target our initial efforts.
9 Other countries require median barriers on all high speed routes that have over 10,000 -15,000 vehicles per day.
10 This is based on treating high risk roads which carry over 12,000 vehicles per day.

CASE STUDY

SH1 LONGSWAMP TO RANGIRIRI (9 KM)

The problem

Two-lane, undivided, high volume road with a history of head-on crashes.

Seven fatal crashes and five serious injury crashes in five years, eight of which were head-on.

The solution

2 + 1 wire rope median barrier installed.

In the three years following installation there were no fatal crashes and two serious injury crashes.

Head-on and loss-of-control crashes occurring during overtaking are often caused by impatience or poor judgement. Passing lanes provide motorists with more opportunities to overtake and could reduce the number of head-on crashes significantly.

CASE STUDY

SH1 PUKERUA BAY TO PLIMMERTON

The problem

Undivided high volume road with high crash rate.

Twenty-nine crashes in five years prior to treatment.

The solution

Median barrier installed and four lanes established.

Ten serious crashes in the four years following treatment, a 44 percent reduction.

Focus safety improvement programmes at high risk urban intersections

Currently 21 percent of fatal crashes occur at intersections. The majority of fatal intersection crashes occur in rural areas, but the majority of serious injury crashes are in urban areas. Most local authorities have identified their highest risk urban intersections, so this initiative will support and build on their existing programmes.

Intersection crashes are often caused by poor judgement, but many are preventable with good intersection design, speed management and strong enforcement of road rules (eg red-light running).

Advanced stop box for cyclists at an intersection in Christchurch

Various proven engineering methods will be used to treat high risk intersections. These include more traffic control signals, roundabouts, advance stop boxes for cyclists, raised pedestrian crossings and speed control treatments. The mixture of treatments used at each site would depend on the types of crashes and the road users we are targeting.

To support this initiative, we also intend to make changes to the give way rules.

Change the give way rules for turning traffic

This action would change the current give way rule to require traffic turning right to give way to all traffic including those turning left into the same road.

The current give way rules[11] place complex demands on road users. Currently, the driver has to check in three different directions: the situation opposite them; behind them; and on the road they are entering – all within seconds. It is even harder if there is no give way or stop sign on a T-intersection. This situation also creates a number of crash risks for pedestrians, cyclists and motorcyclists[12].

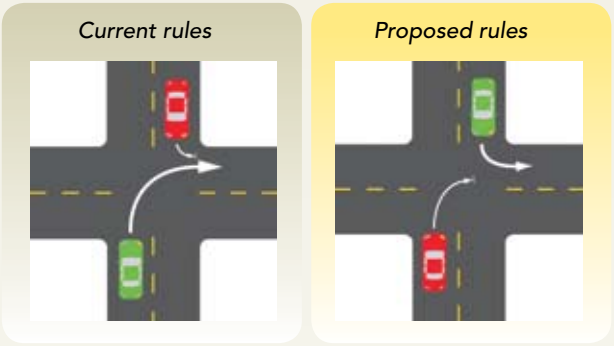
Changing this give way rule would simplify decision making at intersections (including at T-intersections) and could reduce relevant intersection crashes by about seven percent, a social cost saving of about $17 million annually[13].

11 The current give way rules are: if turning, give way to all traffic not turning, and in all other situations, give way to traffic crossing or approaching from the right.

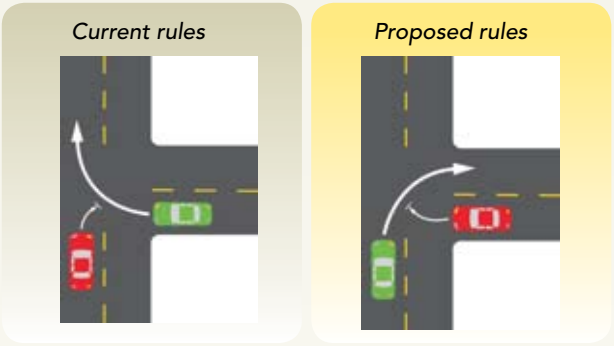
12 The rule creates the following crash risks: between left-turning vehicles and pedestrians crossing the road that the vehicle is turning into, or cyclists on the inside, due to the driver of the vehicle watching for right-turning traffic; between right-turning vehicles and left-turning vehicles; and between right-turning vehicles and vehicles overtaking the left-turning vehicles.

13 The State of Victoria made this change in 1993. The resulting reduction in crashes exceeded expectations and contrary to some predictions there was no increase in crashes in the period immediately following the rule change.

Left turn traffic giving way to right turn



T-intersection



This major rule change would be supported with a publicity campaign and an associated programme of minor engineering changes such as re-phasing traffic signals and changing road markings in some places.

The number of intersection crashes involving pedestrians has increased by 88 percent since 2000, and many of them were hit by a turning vehicle. The changes to the give way rules for turning traffic would improve pedestrian safety. We will review the effectiveness of these changes, and if necessary consider further changes at a later date to give pedestrians more priority.

Implement targeted treatments on popular motorcyclist routes

Parts of the road that are suitable for most vehicles can be particularly hazardous to motorcyclists (eg potholes, corrugations, rough surfaces, gravel on corners, crash barriers, limited or impaired sightlines, and sharp curves). We could introduce a set of treatments on popular motorcycle routes, especially those routes that have a high number of crashes. The first step will be to identify the popular routes.

Improving high risk routes, rather than the whole network, would be a cost-effective way of lowering the estimated social costs of motorcyclist road trauma. A similar scheme in Victoria, Australia, found a 38 percent reduction in motorcycle casualty crashes after sites were treated.

Develop and support new approaches to safety on urban mixed-use arterials

An arterial is a major urban road and many have high crash rates. They have high traffic volumes, cross many intersections and are used by a mixture of transport modes travelling at different speeds. Arterials can also pass through urban centres full of shops, and other commercial and community premises. A lot of our arterials are not designed to cope with this level of competing activity.

Conventional approaches to arterial roads usually involve restricting access to parts of the road by limiting driveway access, removing parking and in some cases installing median barriers. Ideally, different modes of transport would be clearly separated and the road would not pass through land uses which create conflict points, for example, around schools.

However, in reality many of our arterials do not have enough space for transport modes to be fully separated and they pass through areas with a high land-use access function. It is not practical to expect pedestrians and cyclists to use other routes, and it may not be feasible to put in traditional traffic calming measures (eg speed humps). This means we need a different approach.

In the Safe System, an arterial's through traffic function is balanced with its mix of uses and with the way the adjacent land is used. The road's layout and speed limit is designed accordingly. Many of our arterials lack these design features although some local authorities are beginning to address them.

The speed limits on many of our arterials do not reflect this complexity and mix of transport modes. Moderating speeds on these roads would reduce the crash risk and reduce the severity of crashes that do occur, especially for pedestrians and cyclists. Moderating speeds will not have a noticeable effect on traffic flows as these roads tend to be congested anyway.

If this approach involves a change to posted speed limits then roads must have supporting engineering features that help people understand and accept the change.

CASE STUDY

DEMONSTRATION PROJECT ON UNITED KINGDOM ARTERIALS

Overseas, there have been many innovative techniques used to deal with the range of problems at urban arterials. For example, in 2002 the United Kingdom government introduced a series of demonstration projects on urban arterials, investing one million pounds ($2.4 million) in each project.

Common factors in these projects were the reallocation of road space to better reflect the mix of users (eg bus lanes, wider footpaths), improvements to the streetscape, parking management, more pedestrian crossing points, intersection improvements and traffic calming. These are proven methods, but they were combined and integrated in new ways. These projects delivered, on average, a 46 percent reduction in casualties. They also helped to reduce congestion and increase the use of public transport, walking and cycling.

Over the first period of the strategy we will work with local authorities to assess how we could begin to incorporate new approaches to mixed-use arterials, such as the ones trialled in the United Kingdom. A series of demonstration projects is one possibility, building on what some local authorities are starting to do.

Strengthen techniques to integrate road safety into land-use planning

Land-use planning has a major influence on the safety of the transport system. A well laid out community reduces the need for car-based trips and provides safe and convenient access to schools, shops, work and other amenities for all modes of transport. This also improves the efficiency of the network. A poorly-planned community places extra pressure on the network and increases safety risk.

Over the course of the strategy, we will look for opportunities to better integrate road safety objectives into land-use planning. These would include:

- working with local authorities to better integrate safety into regional and district planning, especially District Plans and Long Term Council Community Plans (LTCCP)
- improving guidelines and other tools that influence subdivision development (eg a review of New Zealand Standard 4404 has begun. This Standard influences several aspects of road safety and district planning, especially at District Plan and LTCCP level)
- ensuring that good practice guidelines (eg the Pedestrian Planning and Design Guide) are being used by road controlling authorities
- strengthening initiatives such as Neighbourhood Accessibility Plans (NAPs) that identify and resolve local road safety issues and improve safe access to public transport, walking and cycling networks[14].

PROBABLE FIRST STEPS

The first steps that we intend to take are to:

- develop a classification system for the roading network
- focus safety improvement programmes on high risk rural roads
- focus safety improvement programmes at high risk urban intersections
- change the give way rules for turning traffic.

14 There have been many successful NAP projects that have delivered substantial safety benefits. For example, a NAP in Nelson CBD led to a significant reduction in pedestrian and cyclist crashes and a drop in crime in the first two years of the programme. The benefits exceeded the costs by over 4 to 1. Under a NAP, the roads, pavements, intersections, signs and facilities are improved where possible so that they are safe for local people, particularly children and the elderly. These are often supported by education and enforcement campaigns.