

# SAFER JOURNEYS FOR PEOPLE WHO CYCLE

## CYCLING SAFETY PANEL FINAL REPORT AND RECOMMENDATIONS

DECEMBER 2014





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Road Transport Forum	Gisborne Cycling Tours
Automobile Association	Frocks on Bikes
Ministry of Education	IPENZ - Institute of Professional Engineers of New Zealand
Ministry of Health	SASTA - Safe and Sustainable Transport Association
Accident Compensation Corporation	Architectural Centre
Auckland Council	SafeKids
Auckland Transport	Hawkes Bay District Health Board
Wellington Regional Transport Committee	Alcohol Healthwatch
Tasman District Council	Bay of Plenty District Health Board Public Health Service
Kapiti Coast District Council	Mid-central District Health Board
Nelson City Council	BRAKE (Road Safety charity)
Tauranga City Council	Green Party of Aotearoa
Palmerston North City Council	School Speeds
Bike on/Bikes in Schools	Harbour Sport
Cycle Aware Manawatu	Via Cycles
Cycling Advisory Group Gisborne	West Coast Shuttle
Hutt Cycle Network	Fusion Processing
Cycle Aware Wellington	
Cycle Action Auckland	
Cycle Action Waikato	
North Taranaki Cycle Advocates	Our thanks also go to the many individuals in New Zealand and overseas who took the time and trouble to write to us. Their names are listed in Appendix VII.
Spokes Dunedin	





# FOREWORD

It has been my pleasure to chair the Cycling Safety Panel in developing the recommendations in this report.

The Cycling Safety Panel ('the Panel') was created in response to the 2013 Coronial Inquiry (Matenga 2013) which investigated 13 recent cycling fatalities and concluded that work needed to be done to investigate ways in which cycling on New Zealand roads could be made safer. As a result of the Coroner's recommendation the NZ Transport Agency established the Panel, which is composed of 10 experts in the fields of cycling, transport and human behaviour.

The Panel has been tasked with developing innovative, comprehensive and practical recommendations for how central and local government can ensure on-road cycling is provided as a safe transport option. This document succeeds in meeting the challenge presented to the Panel and the implementation of our recommendations will, over time, result in a material improvement in both the reality and perception of cycling as a safe transport option.

As a regular cyclist I believe making our roads safer for cycling will encourage more people on to their bikes, especially school children. This will bring wider benefits that include reducing road congestion and improving community health, as well as lowering the social and financial costs of serious crashes and fatalities.

My thanks go to a very committed and knowledgeable Panel and the excellent support we have received from NZ Transport Agency officials. The information we have been provided on where and why cycle crashes happen has been invaluable in the development of this report.

I am confident our recommendations will be well received by central and local government and look forward to their implementation over the coming months and years.

Richard Leggat  
Chair, Cycling Safety Panel  
December 2014



This report:

- provides an overview of the current situation of cycling safety in New Zealand
- compares the New Zealand situation to international best practice
- applies the Safe System approach to cycling safety issues
- presents the Panel's recommendations to improve the safety of cycling in New Zealand.

# EXECUTIVE SUMMARY

## Cycling Safety Panel Terms of Reference

*With reference to the November 2013 coronial report on cycling safety, and taking safe system and urban design approaches, develop an innovative, comprehensive and practical set of recommendations for how central and local government can ensure that on road cycling is provided for as a safe transport option.*

The Panel comprises 10 cycling and road safety experts. This document details the recommendations the Panel considers will make New Zealand's roads safer for cyclists. The recommendations are based on a thorough investigation of the nature and causes of cycle crashes in New Zealand. The Panel has consulted widely with interested stakeholders and this final report considers their feedback.

## Our vision

The Panel's vision is ambitious, as all vision statements should be. We are aiming for **'A safe road network with zero fatalities and reduced serious injuries for people who cycle'**.

Over the last decade annual cycling deaths in New Zealand have averaged between nine and ten people, with some annual fluctuations, meaning cyclists made up approximately 3 percent of on-road fatalities over that period. This is disproportionate to their participation in the roading network where cycling comprises 1.6 percent of total time travelling. In terms of serious injury crashes the situation is worse with cyclists now representing around 8 percent of on-road crashes resulting in a hospital admission.

Globally cycling is seeing a resurgence of growth in many countries that were previously regarded as 'cycling unfriendly'. New Zealand is starting to see this trend as well, and the Panel is concerned that without adopting many of the recommendations in this report, we will see increases in cycling deaths and injuries as more people choose to cycle.

The Panel has made 15 broad recommendations, many of which need to be acted upon simultaneously to deliver safer roads for cyclists. This document details these recommendations and the reasons the Panel considers they are important. The Panel's expectation is that the recommendations in this document that are adopted will be incorporated into an action plan by the NZ Transport Agency ('the Transport Agency') and the Ministry of Transport, which will include timelines, budgets, specific outcomes and performance measures.

The number one priority that will do the most towards achieving the ultimate vision, and in the shorter term reduce the incidence of cycling crashes, is providing improved cycling infrastructure, particularly in urban areas where the great majority of crashes occur. The Panel feels strongly that increasing the provision of fit-for-purpose, connected and completed urban cycle networks will make the biggest impact on improving cycling safety.



Our second priority is speed; it contributes to the outcome in every crash and excessive speed increases the likelihood of a crash happening. Over 2,000 people died or were seriously injured in on-road crashes in 2013 (NZ Transport Agency 2014b). The speed at the time of crash contributed to the severity of injury in every case.

Given New Zealand's challenging terrain and current roading network, upgrading the infrastructure and managing speeds will only go part way to improving safety for road users, so how we use the road also needs to change.

The Panel's third priority is therefore to initiate a major culture shift among all road users so that sharing the road safely, whether you are a cyclist, car or truck driver, is more important than getting from A to B as quickly as possible. This will require a mix of regulatory, advertising and training interventions. However, infrastructure, speed management and increased participation in cycling will also help drive this culture shift.

The Panel shares national concerns about impaired driving in any mode, whether due to alcohol or drugs. We were most appreciative of the submission by Alcohol Healthwatch on the extent and impact of alcohol-impaired cycling. In light of this we have recommended further investigation of both alcohol and drug impaired cycling.

### **Understanding real and perceived injury risk**

As well as improving the actual safety of on-road cycling there needs to be a significant improvement in the perception of cycling safety. Cycling is not an inherently dangerous activity, although in New Zealand it is, on average, more hazardous than travelling by car, but the negative perceptions around safety have a marked impact on participation. Evidence indicates that cycling participation and cycle safety are closely linked – when significantly more people cycle it becomes safer at the individual level provided infrastructure improvements are also made. The Panel therefore agrees that growing cycling participation can contribute to the objective of making on-road cycling safer. Growing cycling participation has broader societal benefits including reduced road congestion, reduced

motor vehicle emissions, improved community health and a more people friendly environment.

Finally, none of this will happen without political leadership. Current efforts are good, but more needs to be encouraged, as we have seen from international examples in London, New York and Melbourne.

The Panel has two measures of long-term success. It wishes to see both a reduction in numbers of deaths and serious injuries, and a reduction in the rates of deaths and serious injuries rate per million kilometres cycled and time spent cycling. This will facilitate international comparisons and improve the public perception of cycling as a safe activity leading in turn to further increases in participation.

### **Cycle only crashes**

Only one third of on-road cycle crashes resulting in a hospital admission involve a motor vehicle; the Panel is concerned with both cycle/motor vehicle crashes and cycle only crashes. However, because the severity of crashes involving a motor vehicle is typically greater than cycle only and the current data on cycle only crashes is extremely limited, the main focus of this report is on cycle/motor vehicle crashes.

The information provided for cycle/motor vehicle crashes has shown the Panel where the majority of these crashes are occurring and the nature of the crashes. Poorly maintained roadside shoulders are a contributing factor to non-motor vehicle related cycle crashes (Munster D. et al 2001). The Panel acknowledges more information on non-motor vehicle crashes is required to be able to address the relevant safety issues more effectively.

### **The Human Dimension**

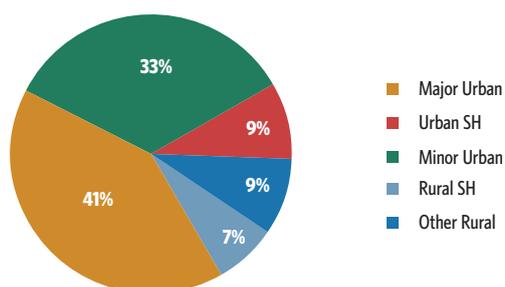
Graphs and statistics can convey the overall picture and trends, but can also separate us from the human aspects of road trauma and the tragedy involved in each death. In Appendix V we have included a moving letter from John Thom and Julie Wagner of Okains Bay about the recent death of Ming Chih Hsieh in a collision with a truck while on a cycling tour of New Zealand. This reminds us that every death is one too many.



From the evidence we have considered, three points stand out for the Panel:

- The majority of motor vehicle/cycle crashes occur at urban intersections and driveways.
- Usable road shoulder width is a key factor in the incidence of rural crashes.
- While cyclists are more likely to be killed or seriously injured in a crash with a car, heavy vehicles are overrepresented in cycling fatalities compared with their proportion of the total vehicle fleet and total vehicle kilometres travelled.

**Cyclist deaths and serious injuries by road type 2008-12**



These three points are addressed by our three priorities: (1) continuous and connected networks, (2) safer speeds and (3) a cultural shift between road users and by recommendations that relate specifically to heavy vehicles.

Cycle crash data and the Panel’s collective understanding of the New Zealand cycling and transport landscape have been influential in the development of a set of recommendations we consider will ultimately help us achieve our vision.

Vehicles involved in cyclist deaths 2003-12		
	Rural	Urban
Bus	6%	2%
Car/station wagon	42%	33%
Motor cycle	2%	2%
SUV	10%	13%
Truck	15%	33%
Van or utility	25%	17%

Intersection type in fatal and serious crashes 2003-12		
	Rural	Urban
Driveway	7%	14%
Roundabout	4%	9%
Traffic signals	0%	9%
Other X junction	4%	10%
Other T junction	15%	32%
Not a junction	70%	26%



# A SAFE SYSTEM APPROACH

We have used the Safe System approach and developed recommendations under the general Safe System enablers and the four pillars of the Safe System as set out in the Government's Safer Journeys strategy (Ministry of Transport 2010).

The Safe System approach views the road transport system holistically by addressing the interactions between the 'elements' of the:

- road user
- road and roadside
- speed
- vehicle.

These elements (or 'pillars') are often shown in this diagram, with the Safer Journeys vision at the centre:



It is the responsibility of all those involved with the design, management and use of the road system to understand this interaction. The 'principles' of the Safe System approach involve recognition of:

- human fallibility
- human vulnerability
- shared responsibility among system designers for reducing deaths and serious injuries
- the need for coordinated efforts to strengthen all parts of the system.

For more on the Safe System approach see Appendix I and [www.saferjourneys.govt.nz](http://www.saferjourneys.govt.nz).

The Panel's key recommendations are summarised below. The rationale and evidence for the recommendations, together with the high and medium priority actions needed to achieve them, are provided in the body of this report.

## the 4 Safe System principles

The Safe System approach aims to create a forgiving road system based on four principles:

### 1 People make mistakes

We need to recognise that people make mistakes and some crashes are inevitable. But what we don't accept is that death or serious injury from crashes is inevitable.

### 2 People are vulnerable

Our bodies have a limited ability to withstand crash forces without being seriously injured or killed. Crash forces need to be kept to survivable levels.

### 3 We need to share responsibility

System designers and people who use the roads must all share responsibility for creating a road system where crash forces do not result in death or serious injury.

### 4 We need to strengthen all parts of the system

We need to improve the safety of all parts of the system – roads and roadsides, speeds, vehicles, and road use so that if one part fails, other parts will still protect the people involved.



# HIGH PRIORITY RECOMMENDATIONS SUMMARY

SAFE SYSTEM ENABLERS	
1.	Give <b>greater priority to active transport needs</b> (cycling and walking) in all land transport planning and investment decisions. This needs to be reflected in the Government Policy Statement on Land Transport Funding (GPS), the National Land Transport Programme (NLTP), the Transport Agency's Investment Assessment Framework, the Economic Evaluation Manual (EEM) and councils' long-term community plans.
2.	Establish and resource <b>dedicated teams</b> in the Transport Agency and Ministry of Transport with staff and funding to plan, implement and evaluate investments in cycling. Local government is encouraged to do the same.
3.	Improve the quantity and quality of <b>data collection</b> , especially for non-motor vehicle crashes.
SAFE SPEEDS	
4.	Ensure the needs of cycling are considered in the implementation of the <b>Safer Speeds Programme</b> .
SAFE ROADS AND ROADSIDES	
5.	Accelerate the provision of completed, fit-for-purpose, connected <b>cycle networks</b> .
6.	<b>Design intersections</b> so they are safe for cyclists. Trial European design guidelines for roundabouts and other innovative treatments.
7.	<b>Separate cyclists</b> from high-speed and high-volume or high freight density traffic.
8.	Progressively remove <b>parking from arterial roads</b> where it is a safety risk.
9.	Develop and promote nationally applicable <b>design guidelines</b> for cycling infrastructure.
SAFE ROAD USE	
10.	<b>Trial mandatory minimum passing distances</b> for motor vehicles overtaking cyclists in conjunction with an information campaign explaining the rule change to all road users.
11.	a. Increase and incentivise <b>training for commercial drivers</b> about driving safely near cyclists b. Raise <b>cyclist awareness</b> of the risks of riding near heavy vehicles.
12.	Increase the safety of <b>cycling to school</b> through a package of Safe System measures.
13.	Improve all road user <b>attitudes and behaviours</b> towards sharing the road safely.
SAFE VEHICLES	
14.	Investigate the costs and benefits of introducing mandatory <b>truck side-under-run protection</b> and other <b>vehicle safety features</b> .
15.	Adopt improved standards for <b>bicycle lights</b> .



# OVERVIEW DIAGRAM



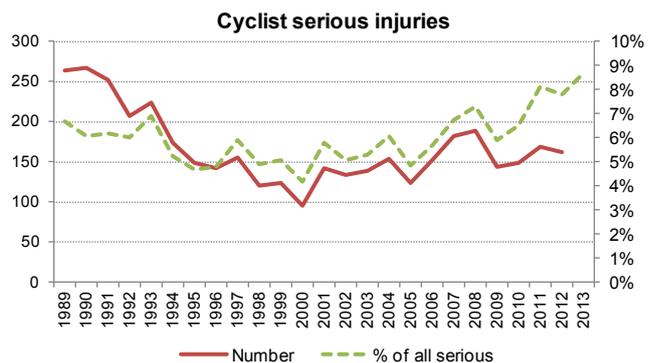
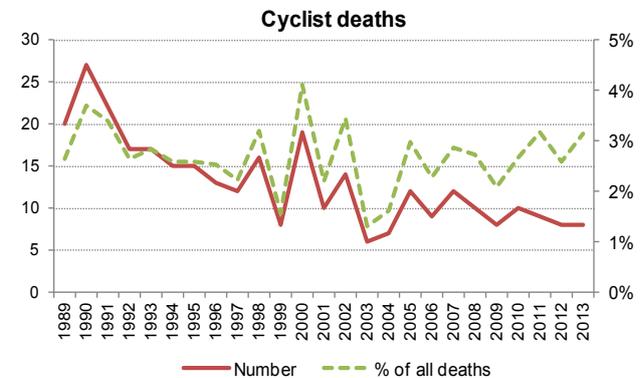
# CYCLING IN NEW ZEALAND

**Almost everyone in New Zealand over 40 years old can remember when the bike sheds at their school were full. Now there are only a few schools with bike sheds and even fewer of these are full.**

The decline in cycling to school has been mirrored in cycling to work but is more obvious because such a high percentage of school children used to cycle. Since 1990 the numbers cycling to school have declined by approximately 75 percent. Society is now missing out on the other benefits cycling can bring. As noted in the Executive Summary we are seeing some lift in adult cycling and the Panel expects this positive trend to continue, especially if perceptions around cycling safety can be improved. Although there is a lack of strong evidence, the Panel believes that children who regularly cycle will grow up to become safer drivers.

The Panel wishes to stress that cycling is not a dangerous activity, but it could be safer when compared with other modes of transport and other countries. There is approximately one fatality for every two million hours cycled in New Zealand. The World Health Organisation has found that a person who cycles to and from work every day instead of using a car, reduces their risk of death from all causes by 30 percent (WHO Health Economic Assessment Tool).

## Historical trends



Serious cyclist injuries more than halved during the 1990s but since then have risen again. After dropping to 5 percent of all serious injuries by 2000, cyclists now comprise around 8 percent of all serious injuries in motor vehicle crashes.

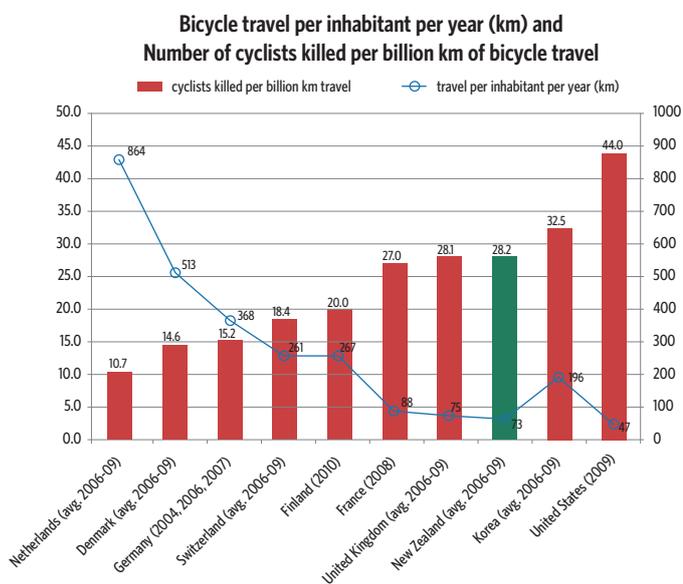
The pattern has not been consistent across age groups. For children the number of deaths and serious injuries combined has dropped to less than a third of what it was in 1990. For adults, after a drop during the 1990s, injury levels have risen again to levels similar to (18-64 year olds), or higher than (65+ year olds) those in 1990<sup>1</sup>.

<sup>1</sup> See [www.transport.govt.nz/research/crashfacts/cyclistcrashfacts/](http://www.transport.govt.nz/research/crashfacts/cyclistcrashfacts/) and [www.transport.govt.nz/research/roadcrashstatistics/](http://www.transport.govt.nz/research/roadcrashstatistics/)



## International comparisons

The figure below shows average distances cycled per person (the blue line) against the number of cyclists killed per billion kilometres of travel (bars). New Zealand's performance is closest to the United Kingdom and France. The graph indicates a positive relationship between increasing cycle travel and increasing safety. Most countries do not collect travel data by bicycle, and for that reason, Australia is not included in the graph.



Relative safety of cycling in different countries compared to the level of cycling activity:  
(Axel Wilke)

Note: The cycling fatality risk in New Zealand is nearly three times that in the Netherlands per billion kilometres travelled. On average Dutch people cycle about 12 times further per year than New Zealanders (864 kilometres compared to 73).

## Cycling safety and participation – the “safety in numbers” concept

The safety of cyclists is inextricably linked with the number of people cycling. This is generally considered to be because of “safety in numbers” – in other words, an increase in people cycling directly reduces the risk of injury per cyclist. Comparisons between countries and cities show that places where there is more cycling have a lower risk of injury.

There are a number of mechanisms behind safety in numbers. More people cycling on the road means drivers are more aware of them, reducing “looked but didn’t see” crashes. Greater use of cycling for transport means more people driving also know what it’s like to be on a bike and how to behave safely around people cycling. As cycling becomes a socially acceptable part of the transport system, it’s likely that attitudes improve and aggressive behaviour by drivers reduces. All of these mechanisms can act as positive feedback loops, as they also improve the perception of safety and encourage further cycling.

When starting from a very low base, experience suggests that it takes time for any safety in numbers effect to be seen – it may not begin to have a noticeable effect until cycling reaches somewhere in the order of 5% of all journeys.

However, just comparing cities and countries at a single point in time hides a number of important relationships that are confused with what is usually called “safety in numbers”. This includes a “numbers in safety” effect – in other words, countries and cities that have made significant investments in improving cycling safety through managed speeds and well-designed infrastructure see both improvements in safety and increases in cycling at the same time. In addition, vehicle numbers play an important role in safety and participation. Again this can act as either a positive or negative feedback loop, depending on whether vehicle numbers or trips by bike are increasing. The Panel has concluded that in the New Zealand context, simply encouraging more people to cycle would have a negative safety impact. It is essential to provide safe, connected networks and the other improvements recommended in this report as the foundation for both “numbers in safety” and “safety in numbers”.

Strengthening the positive feedbacks of increased numbers of cyclists, effective infrastructure, safe speeds and reducing vehicle numbers can lead to reductions in both the rate of injury and the absolute number of injuries and deaths, as has been the case in Portland, Copenhagen and the Netherlands.

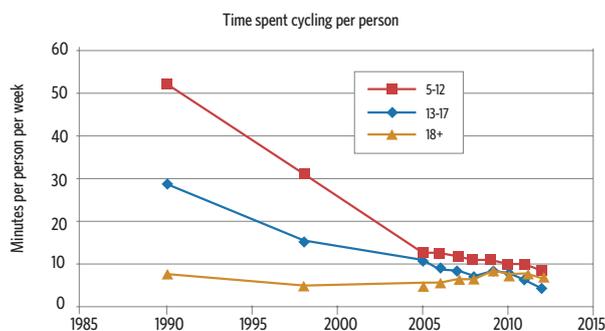


## Cycling trends

The period since 1990 has seen a large increase in the New Zealand population, a great deal of 'urban sprawl' and a significant increase in car ownership due to the easier availability of cheaper imported used cars. Nevertheless, despite popular perception, commuting distances remain very viable for cycling in New Zealand, with median distances representing an under 30-minute bike ride in our three largest urban regions.

Over the last five years many car-dominated cities have been seeing a resurgence in cycling. A combination of traffic congestion, health and obesity issues, environmental concerns and the economic benefits of cycling have seen a number of high-profile politicians successfully promote increased cycling. London, New York and Melbourne are three very good examples of political leadership twinned with infrastructure improvements resulting in significant growth in cycling participation (albeit from low bases).

Automatic cycle counters in Wellington and Auckland indicate that New Zealand is also seeing an increase in cycling numbers (Auckland Transport Cycle Monitoring Report 2014). Increasing pressure on available road space often causes tension between different road user groups and undue risk-taking. Causes of disharmony include cyclists running red lights and riding on footpaths, or motorists passing cyclists at unsafe distances. Consequently there is work needed in the 'Share the Road' space to ensure that all road users respect both the rules and other road users. In New Zealand, the cycling infrastructure is, in general, piecemeal and of variable quality, and political leadership is only now becoming apparent.



Along with the growth in on-road cycling numbers for commuting, sport and recreation, New Zealand is also experiencing very strong growth in off-road

recreational cycling and mountain biking. The 2009 Job Summit led to the creation of Nga Haerenga, The NZ Cycle Trail. This network of 23 Great Rides and over 2,000 kilometres of connector routes has provided safe, off-road cycle paths and connecting roads that have given many thousands of New Zealanders a reason to get back on their bikes.

Cycling surveys consistently state the number one reason people do not cycle, or do not allow their children to cycle, is they feel it is too dangerous. This creates the most important loop in our cycling system at the moment – any increase in cycling leads to greater reporting of injuries and deaths, with a strong dampening effect on further growth. We have seen the NZ Cycle Trail attract people who, currently, would not dream of riding in the town or city where they live because they perceive it to be too unsafe. New Zealand is seeing some growth in cycling commuters but, to see material increases, people need to feel safer than is currently the case.

Preliminary data (Hastings District Council 2013) from the Hastings model community project (see next page), indicates that cycling crashes have declined and people's perceptions of the safety of cycling have improved. This is a good example of what can be achieved; although it should be noted that ongoing investment is required to continue to grow the numbers of people cycling, and to have them cycle more often. The plans Christchurch has for an extensive integrated network of cycleways and the recent opening of the Auckland cycleway extension through to the central business district (Grafton Gully and Beach Road cycleway) are evidence that councils and government are starting to take a more proactive role in providing fit-for-purpose infrastructure for cycling. But there is still a very long way to go to get close to catching up to the northern Europeans.

### How other countries have improved cycling safety

It is easily forgotten that the Netherlands was not always a cycling utopia. Cycling became so marginalised by modern urban development in the post-war period, and motor traffic such a dominant force, that 3,300 people were killed by motor vehicles in 1971 (Cavenett, 2011). What makes the Dutch different from their peers was their refusal to accept



road deaths as the price of efficiency. They were also outraged at the space taken up by cars. Street protests with the powerful message 'Stop de Kindermoord' (stop child murder) coincided with the 1973 oil shocks. People enjoyed the traffic-free streets of car-free Sundays, which led to city centres being made permanently car-free.

Mass protests continued to demand dedicated cycling infrastructure. It is now an integral part of the Netherlands' transport policies. Child road deaths decreased to 14 in 2010 from over 400 in 1971.

An important difference between the Dutch protests and other cycling advocacy campaigns is that Stop de Kindermoord was not about cycling versus cars, it was about child safety on roads, a topic well understood by the wider public. Cycling infrastructure was the most effective policy response to that problem, along with child friendly street designs that reduced driving speeds and improved facilities for walking. The Dutch cultural shift took approximately 10 years, undertaken by parents and professional campaigners and resulted in embedded cycling policy at a national government level. New Zealand policy makers have a golden opportunity to strengthen these processes through up-front planning and investment.

New York and London are among many major cities transforming their congested roads into cycle friendly environments. Urban cycle advocates, who believe that New Zealand is capable of joining the cycle friendly countries of the world, are becoming more vocal and visible.

Coroner Gordon Matenga noted in his review of cycling safety in New Zealand that 'a rethink of cycling safety in New Zealand is required, that attitudes both of motorists to cyclists and cyclists to motorists need to change' (Matenga 2013). The Panel considers that this rethink needs to extend beyond cyclists and motorists to planners, engineers, government officials, police officers, schools, parents, councillors, corporations, employers and employees and anyone who uses the road network.

**Model Communities** are urban environments where walking and cycling are offered to the community as the easiest transport choices. The benefits include improved safety, congestion relief, reduced environmental impacts and improved public health. The intention is to deliver safer environments for novice users, with a range of community destinations within reasonable riding or walking distance from residential population centres. Climate, topography and demographic characteristics are also important factors.

In mid-2010, New Plymouth and Hastings were named as New Zealand's first walking and cycling model communities. The two councils received \$3.71 million and \$3.57 million respectively for walking and cycling infrastructure plus \$1.17 million and \$691,000 respectively for educational measures such as travel planning, cycle skills training and website development. Ongoing funding has been allocated.

**New Plymouth's** focus was building on existing investments. This meant extending and/or upgrading existing paths to make them safer and more user friendly, ensuring they connected to the right destinations, and expanding successful skills training and awareness campaigns. Let's Go is a behaviour change programme to encourage and enable people to leave their cars behind and try active transport. Schools are a target because they play a central role in the life of the community and will foster the next generation of riders and walkers.

**Hastings** has developed iWay, a hierarchy of walking and cycling routes consisting of four key walking and cycling arterials and a highly visible and coherent network of adjoining collector level routes that link where people live, work and learn. Prior to iWay, cycling was largely seen as a sport and the general feeling in Hastings was that riders did not belong on the road. A regional Share the Road campaign has led to greatly improved perceptions of safety.

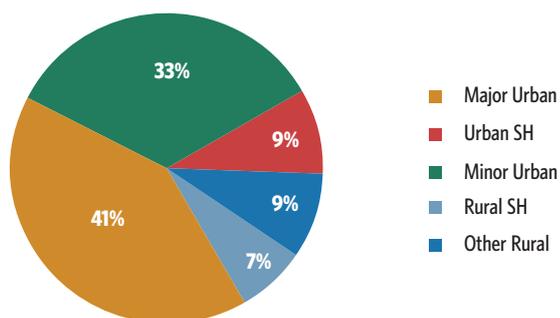


## Summary of the main safety issues for people who cycle

The following comments and the figures used are based on 2008-12 data in the Crash Analysis System (CAS) maintained by the Transport Agency. Until recently Police did not report cyclist-only crashes to CAS, so information on them has been drawn from hospital admissions and ACC data.

There are significant differences in the types of risks for cyclists between rural and urban roads.

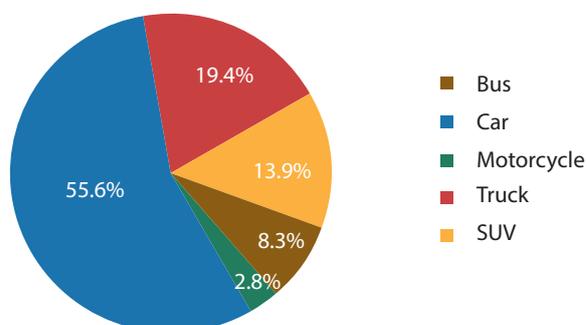
**Cyclist deaths and serious injuries by road type 2008-12**



## Rural roads

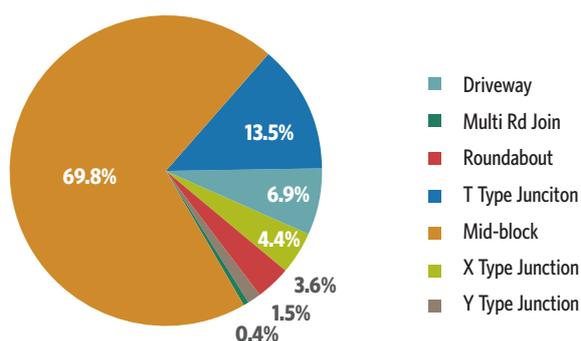
A rural road means one with a speed limit of 80 km/h or more. From 2008 to 2012 there were 24 deaths and 120 serious injuries. **While only 9% of cyclist injuries happen on rural roads, more cyclists die on rural roads than urban ones, and rural injuries are twice as severe as those at urban speeds (70 km/h or less), with 39 % of reported injury crashes involving death or serious injury.**

**Vehicles involved in rural cyclist deaths 2003-12**

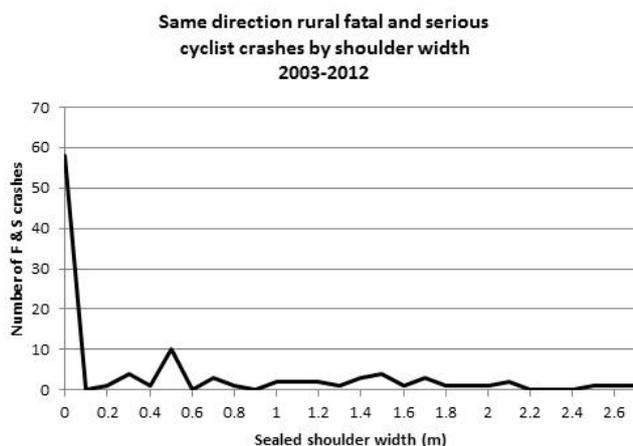


**On rural roads, four out of five cyclist deaths and three quarters of all deaths and serious injuries, do not involve intersections and driveways. The typical crash involves a cyclist being struck from behind on a straight road.** Usually the cyclist is not seen in time and some are overtaken with insufficient clearance and speed of impact is high. One in six crashes was at night which suggests a high risk in relation to the lower cyclist numbers at night.

**Junction type in rural cyclist fatal and serious crashes 2003-12**



**Lack of shoulder width is a significant factor.** Rural cyclist crashes were plotted on a map and the sealed shoulder width compared to records and aerial photos. Crashes are scattered widely across the network and the majority happen occur where there is no road shoulder – see figure below.

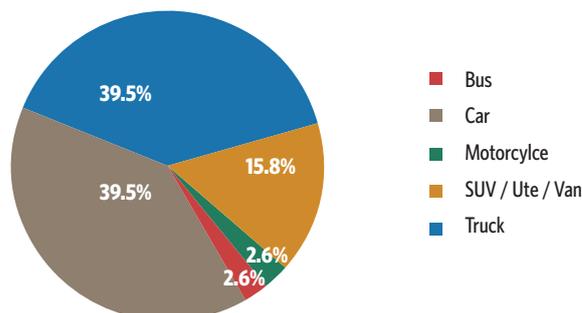


The lack of shoulder width, particularly between 0 and 1 metre, results in a greater risk to cyclists from heavy vehicles which require more room to overtake safely. Other rural road crashes are ‘fail to give way’ conflicts with similar issues to the urban problems.

## Urban roads

An urban road is one with a speed limit of 70 km/h or less. From 2008 to 2012 there were 19 deaths and 748 serious injuries. Intersections and driveways present by far the greatest risk accounting for three quarters of deaths and serious injuries. Where one party was required to give way, five times out of six the car failed to yield. Almost every time the cyclist was not seen by drivers required to give way to them. Fortunately in many of these crashes the motor vehicle speed is below the threshold for death and serious injury. However where heavy vehicles are involved, injuries are more severe. **39% of urban cyclist deaths involved a heavy vehicle during this period.**

**Vehicles involved in urban cyclist deaths 2003-12**

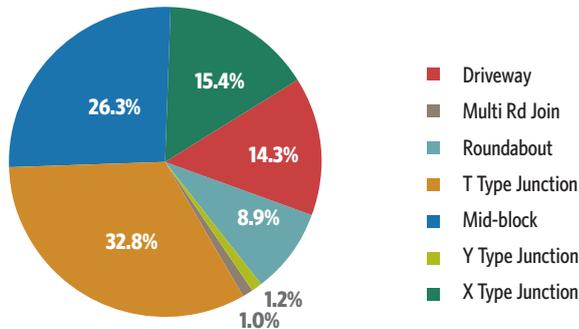


**Failure to see the cyclist is by far the dominant reason for urban cycling injuries** – the factors involved in different road situations are explained next.

**Priority “T” and “X” junctions** are by far the most common on the network so not surprisingly have the highest number of cyclist collisions. They typically involve motor vehicles emerging from a side road, or turning right across a cyclist’s path from the opposite direction. Often the cyclist has been riding past stationary traffic and the driver has turned through a gap. Research indicates that the lowest risk to a cyclist is when the cyclist is positioned closest to the through traffic where they will be in the central vision of a driver looking for another vehicle. The same principle applies at driveways and roundabouts.



### Junction type in urban cyclist fatal and serious crashes 2003-12



**At traffic signals**, the risk from side road traffic is well controlled but cyclists are still at risk from left and right turning traffic. For left turning traffic, research shows that where the left lane is marked for both through and left turning traffic, the risk is about four times greater than where a lane is marked for left turn only. Multiple through lanes pose the greatest risk from right turning traffic, where it is permitted to pick a gap to turn on a full green signal.

**Driveway deaths and serious injuries** often result from vehicles reversing from the driveway, children riding out from the driveway and drivers failing to see a cyclist when turning into or leaving a driveway.

**Parked cars** create a number of hazards. Apart from inattentive cyclists running into the back of them, car doors can open into a cyclist's path and vehicles parking, leaving and performing U-turns may fail to notice cyclists. Cyclists avoiding parked cars and similar obstacles can move into the path of overtaking traffic and increase the risk of death or serious injury.

Unlike on rural roads, **deaths and serious injuries on urban roads due to being struck from behind are rare**. However this crash type is important because the proximity of overtaking traffic is an important contributor to cyclists' perceptions of risk on urban roads, and hence the need for increased separation from traffic to overcome the 'fear barrier' to increase safe cycling participation.

### Roundabouts have the highest risk for cyclists

because drivers, who are required to give way when entering roundabouts, travel faster than at other intersections. Drivers tend to check for vehicles earlier on the approach, and look past cyclists, positioned in the periphery of their vision. Larger and multilane roundabouts are the worst. While roundabouts are the safest intersection form for cars, because they reduce impact speeds to below the safe system thresholds for serious injury, operating speeds are typically too high for pedestrians, cyclists and motorcyclists under safe system principles, and a high proportion of injuries are to cyclists. Roundabouts had 68 serious injuries and 4 deaths in this period; 3 of the deaths involved trucks.



Examples of cycle roundabouts with a shared lane.

Source: Christchurch City Council: Cycle Design Guidelines 2013



**Non-motor vehicle crashes (cyclist only and cyclist vs pedestrian)** Cyclist injury crashes not involving a motor vehicle were not reported by Police until recently, as noted earlier. So while the numbers come from hospital admissions, there is little routine information on crash characteristics and causes. In 2012 there were 305 cyclists admitted to hospital from crashes involving a motor vehicle. There were 1036 cyclist admissions that did not involve a motor vehicle. It appears that some of these non-motor vehicle crashes would include off-road riding.

**The number of cyclists hospitalised from non-motor vehicle crashes is over three times the number hospitalised from collisions with motor vehicles.**

However, on average the number of days-stay from non-motor vehicle crashes (1.6 days) is less than that from motor vehicle collisions (2.6 days).

New Zealand research so far indicates the following common causes of cyclist only crashes:

- Gravel or debris on the road surface
- Surface irregularities – e.g. potholes, judder bars
- Loss of balance
- Slippery surface



# THE CYCLING SAFETY PANEL



Left to Right: Glen Koorey, Mike Noon, Sarah Ulmer, Richard Leggat, Alexandra MacMillan, Axel Wilke, Simon Kennett, Marilyn Northcotte, Alistair Woodward, Hamish Mackie

**The Cycling Safety Panel comprises 10 experts from across the cycling and road safety spectrum.**

**Richard Leggat** (Chair) Chair of the New Zealand Cycle Trail and Board Member of Bike NZ

**Simon Kennett** Active Transport and Road Safety Coordinator at Greater Wellington Regional Council

**Dr Glen Koorey** Senior Lecturer in Transportation Engineering at the University of Canterbury

**Dr Hamish Mackie** Human factors specialist, Mackie Research & Consulting

**Dr Alexandra Macmillan** Senior Lecturer in Environmental Health at the Department of Preventive and Social Medicine, University of Otago

**Mike Noon** General Manager Motoring Affairs, Automobile Association

**Marilyn Northcotte** Regional Coordinator of Pedal Ready cycle skills training programme Wellington

**Sarah Ulmer** 'Ambassador' for the New Zealand Cycle Trail, Olympic cycling gold medallist

**Axel Wilke** Traffic engineer and transport planner specialising in sustainable transport, ViaStrada Limited

**Professor Alistair Woodward** Professor of Epidemiology and Biostatistics at the University of Auckland

## PROCESS AND TIMELINE

The Panel met seven times throughout 2014 and focused on specific issues and their contributing factors.

**April** Cycling Safety Summit – broad exploration of cycling specific issues with the wider cycling community.

**May** Panel Meeting – analysis of rural specific issues.

**June** Panel Meeting – analysis of urban and school specific issues.

**July** Panel Meeting – examination of obstacles to cycling in the legislative and investment process. Analysis of a selection of international cycling strategies and action plans.

**August/September** Consultation with Local Government New Zealand, the Road Transport Forum and the Police regarding draft recommendations to date. Sharing of thinking on proposed recommendations with representatives from the cycling advocacy groups, and prioritisation of actions.

Refer to Appendix VII for the Summary of Submissions and list of submitters.

**October** Second Cycling Safety Summit on October 17 – consultation on draft report and recommendations. International peer review by Dr Cameron Munro, CDM Research, Melbourne (see Appendix II)

**November** Finalising the report and recommendations in light of submissions received.



# THE PANEL'S RECOMMENDATIONS

## OUR VISION

**A safe road network with zero fatalities and reduced serious injuries for people who cycle.**

## SAFE SYSTEM ENABLERS

### Strengthen and streamline decision making to provide a safe road system for cyclists

**The Panel has five areas of concern here:**

- A. Cycling is often an after-thought during the infrastructure planning and design process. Cycle lanes are squeezed into roads that have been built for trucks and cars. Speed limits, intersections and parking are designed for motor vehicles, and people who cycle are most often considered too late in the process (if at all). Land designated for new roads often does not make allowance for safe cycling infrastructure.
- B. Cycling projects struggle to access funding because they are not accorded sufficiently high priority within either the RCAs or the Transport Agency. There have been many instances over recent years where cycling projects experienced difficulty either gaining local council support or meeting Transport Agency investment criteria. Councils have told the Panel they would like a clear national commitment to sustained investment in cycling and a partnership approach from the Agency.
- C. Current design guidelines for cycling infrastructure are inadequate resulting in a range of infrastructure that lacks consistency and is often not fit for purpose.
- D. The cycling sector lacks visibility in planning and investment due to the lack of strong leadership.
- E. Limited data collection constrains the decision-making process.

The problem starts at the top with national strategic documents, flows through to the distribution of investment funds, project level costs and benefits analysis, regional council strategic planning, and right through to the implementation of projects on the ground. This is a cause, in the Panel's view, of planning and investment criteria prioritising journey time impacts above safety and failing to include other benefits and costs at a population level.

The safety issues and mitigations that are particular to cycling are known to the Transport Agency. Recommendations are already present in strategic documents such as Safer Journeys, the draft Government Policy Statement (GPS) and the Transport Agency's Statement of Intent (SoI). The Panel is concerned that such proposed actions are often given a low priority or that there are unnecessary barriers to fully utilising allocated funding.

Regional, city and district councils are essential partners in making cycling a safer mode of transport and mobility. Closer collaboration between the Transport Agency and councils (collectively called Road Controlling Authorities or RCAs) is needed to develop transparent assurance systems that the appropriate investment is being allocated to cycling. The Netherlands is a good example of a transparent assurance system that is based on national and local appraisal. The Panel would like to see the current draft voluntary benchmarking process for cycling provision implemented by all RCAs. This benchmarking tool helps authorities identify and share best practice.

RCAs do not have meaningful accountability and key performance indicators (KPIs) around cycling safety outcomes and participation. The Panel would like to see more accountability linking funding to safety outcomes regarding cycling safety in particular.

The Panel is concerned that there is an ad hoc and inconsistent approach to cycling and would like to see some assurance that RCAs are building fit for purpose, value for money, well-assessed cycling infrastructure. National design guidelines, increased training of designers and planners and better design auditing of cycling provision in all transport projects would help.

Although cycling data capture in New Zealand is better than in most peer countries, it is weak and incomplete

on many levels. Cycling crashes are under-reported, especially non-motor vehicle crashes, in the Transport Agency's Crash Analysis System (CAS), making it difficult to measure the size of the problem. Data suggests two-thirds of injury crashes do not involve a motorised vehicle, but we have limited understanding of what is causing these crashes. We also do not know how many people are cycling, to a fine-grained level, which inhibits planning and investment for cycling infrastructure. Unlike safe workplace measures, no facility exists to report bicycle-related hazards and near misses (Ngatuere 2014).

Additional questions to ask at the scene of a cycling crash, or on hospital admission, and routine linkage between the two, could help prevent future crashes by better informing road planners and cyclists.

There is no central database of dedicated cycling infrastructure provision and different RCAs may use different definitions of terms such as 'segregated cycle path', 'separated cycle path', 'cycleway', 'cycle lane', etc.

The International Transport Forum emphasises that 'national level commitment, or at a minimum, regional-level commitment, is important in setting the right legal, regulatory and financial framework so that successful implementation of cycling strategies can take place' (OECD/International Transport Forum 2013).

### Socio-economic and ethnic disparities in cycling

Unfair distributional impacts of policies and investment already occur in the transport sector. This includes both benefits (for example inequitable access to public transport services by income) and harms (for example greater exposure to injury by ethnicity). Ensuring socio-economic and ethnic equity needs to be a key consideration when planning and delivering cycling infrastructure and services. Examples of programmes including cycling and cycling facilities that target social inequalities are Future Streets [www.futurestreets.org.nz/](http://www.futurestreets.org.nz/) and Bikes in Schools (see page 40).

### Local Government investment: Christchurch

Improving the safety and accessibility for cycling was a strong theme for earthquake recovery to emerge from the Share an Idea discussion in 2011. People said they wanted the Christchurch City Council to invest in cycling infrastructure to provide more choices and safer routes for people travelling to work, study or play.

The council is planning on building 13 major cycle routes to encourage the large group of people who think they would cycle, or cycle more, if it was safer.

To achieve this means making some significant changes to the transport network in favour of cycling on these routes. In some locations this will result in cyclists having priority over cars at intersections and reducing on-street parking.

Funding of \$68.5 million for the major cycle routes was approved in the Christchurch City Three Year Plan 2013-16. In the 2014-15 Annual Plan, the council committed to deliver the project over five years.

Construction of the major cycle routes started in 2014.

Christchurch City Council (2012)



Photo courtesy Glen Koorey

## Current cycling initiatives – Safe System enablers

- Consultation with the cycling sector to improve the visibility of existing guidance about safe cycling e.g. Bike Wise.
- Partial acknowledgement in the draft GPS of cycling's significant potential role in the transport system.
- Some limited investment provision in the draft GPS and the Transport Agency's Sol. (See Glossary – Key strategic documents)
- Investment in the Model Communities in New Plymouth and Hastings.
- The provision of an additional \$100m in Crown funding in 2014–18 for cycling infrastructure with priority given to completing comprehensive cycling networks in main urban centres.
- The Transport Agency has a small number of staff focused on cycling activity, but has recently appointed a National Manager Cycling and is building a dedicated team of advisors.
- CAS is a database managed by the Transport Agency. It contains all the Police Traffic Crash Reports received by the Agency together with crash analysis software and basic road data. Until recently on-road cycling deaths that did not involve a motor vehicle were not required to be notified to CAS.
- Local councils conduct annual road user surveys, and some of them count cyclists.
- The Ministry of Health collects hospitalisation data, and the Accident Compensation Corporation (ACC) collects injury claims data. However, the categorisation and information collected for cycle crashes can be inconsistent.
- The Ministry of Transport (2014a) collects New Zealand Household Travel Survey data, which is invaluable for measuring cycling participation at a national level; without this data we would struggle to express cycling injuries as rates (e.g. per 100,000 kilometres travelled).

- A number of cities, including Auckland, Hamilton, Palmerston North and Christchurch have continuous automatic bicycle counters, which provide detailed and consistent information on cycle traffic at key sites. The results have been useful for raising awareness and communicating with the media.

## Emerging cycling cities and their leaders

### *New York and London*

The 2002 New York mayoral election may have been a case of the right person at the right time when New Yorkers wanted a more liveable city following the terrorist attacks on the World Trade Centre. Michael Bloomberg and his Transportation Commissioner, Janette Sadik-Khan, have proven to be strong, effective and visionary leaders. A city once known for dysfunction and congested streets has been transformed with the creation of separated bicycle facilities and a successful bike hire scheme.

London's Mayor, Boris Johnson, is also a great cycling advocate who has done much to improve cycling by extending the cycling infrastructure and mandating side under-run protection on trucks. London's cycling success is also a question of timing; after the London tube and bus bombings, commuters were ready to look to cycling as a safe and viable alternative travel mode.



### *The Panel recommends:*

New Zealand Household travel survey and CAS. Use this data to target some cycling investment to communities at greater risk of cycling deaths or serious injuries.

## **HIGH PRIORITY ACTIONS**

- i. Active transport needs (cycling and walking) be accorded a greater priority in all transport planning and investment decisions. This needs to be reflected in the GPS, the National Land Transport Programme, the Safer Journeys Strategy, the Transport Agency's EEM and councils' long-term plans.
- ii. The Transport Agency and Ministry of Transport establish and resource dedicated teams, with senior leaders, staff and funding, to plan, implement and evaluate investments in cycling. Local government is encouraged to do the same.
- iii. Central and local government improve the quantity and quality of data collection for real and perceived cycling safety, especially non-motor vehicle crashes.

## **MEDIUM PRIORITY ACTIONS**

- i. Help RCAs access National Land Transport Programme funding. The planning and investment criteria are currently making it difficult for cycling projects to meet the 'high strategic fit' criterion and need to be reviewed and monitored. Cycling must be considered in all integrated transport strategies, plans and projects. This would include adjusting the application of the network operating framework to give effect to cycling<sup>2</sup>.
- ii. Establish KPIs and benchmarking based on cycling and participation.
- iii. Improve understanding of the distributional impacts of cycling participation and injury by socio-economic status and ethnicity through improved relevant data collection data in the

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2 The purpose of a framework for network operations is to assist network managers to monitor the performance of road networks, identify gaps in performance and service delivery, and determine which measures may best address those gaps most efficiently against the needs of a broad range of road users. ([www.onlinepublications.austroads.com.au/items/AP-R338-09](http://www.onlinepublications.austroads.com.au/items/AP-R338-09))



## SAFE SPEEDS

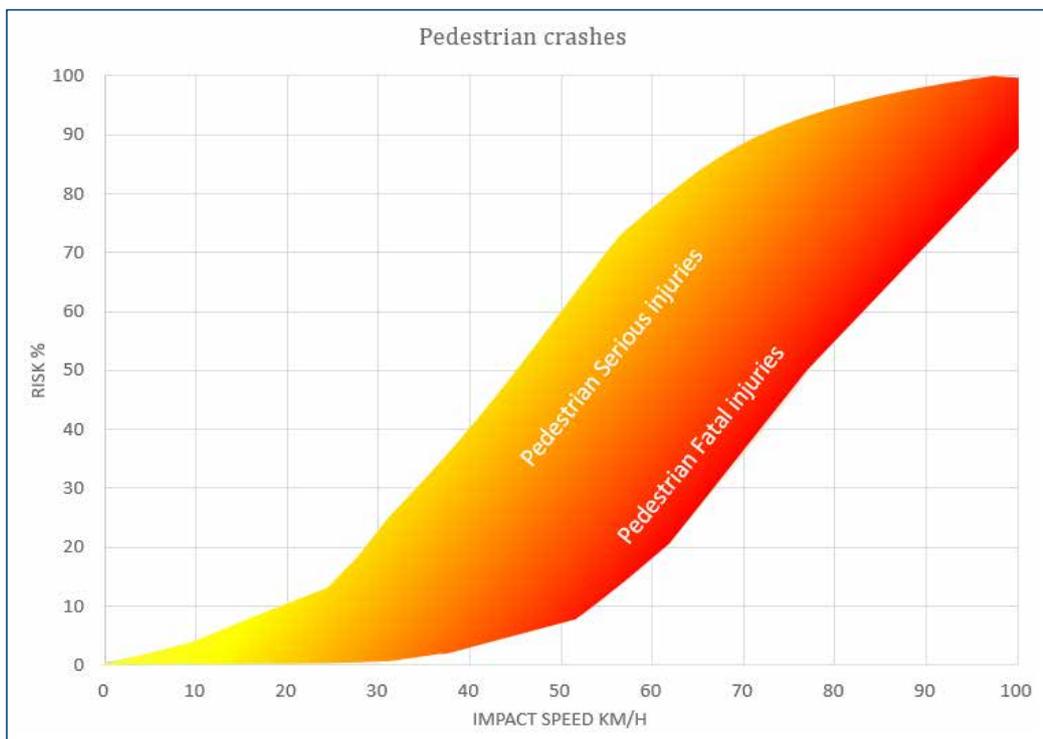
### Ensure the needs of cycling are considered in the implementation of the Safer Speeds Programme

Better speed management is essential to optimising safety gains – not just for cyclists but for all road users. The evidence is clear that increases in speed disproportionately affect crash severity and also increase the likelihood of a crash happening. Impact speed influences the survivability of a crash – particularly for cyclists, who do not have the protective shell of a car or truck. Occasionally, tools intended to manage speed, such as pinch points, can inadvertently add to cycling's safety risk if not well designed.

On many roads New Zealand's default speed limits of 50km/h and 100km/h make it hazardous for cycling to mix with motor vehicle traffic. Where it is not possible (or pragmatic) to physically separate these modes, then lower motor vehicle speeds are required to reduce the speed differential. In countries noted for their strong cycling culture, a key part of their success is due to their adoption of lower speed environments.

The Safer Journeys Action Plan requires that speeds support both safety and economic productivity, and that they are appropriate for road function, design, safety and use. The new One Network Road Classification (ONRC) system provides the opportunity to better align travelling speed with road function because the classifications are based on traffic and freight volumes (NZ Transport Agency 2014b). Travel time reliability is more important economically than travel times per se – unpredictable congestion stop-starts in 60km/h zones are worse than travelling smoothly at 30km/h for instance. There are direct economic upsides to lowering speeds, including lower road crash costs, reduced traffic noise and vibration, health benefits from encouraging more walking and cycling, and creating urban places that attract greater foot traffic and lingering – both of which increase local business custom.

The Safer Speeds Programme recently adopted by the National Road Safety Committee aims to reduce deaths and serious injuries and support economic productivity by establishing safe and appropriate speeds, according to road design and function.



This graph shows how small increases in speed greatly increase risk. At 50km/h the risk is four times that at 30km/h. Cycling and pedestrian injury risk vs speed curves are very similar (source: Mackie Research Ltd.)



## Current cycling initiatives

- Under the Safer Journeys Action Plan 2013-15, the Safer Speeds Programme is being developed jointly by the Ministry of Transport and the Transport Agency in consultation with stakeholders. When implemented this will include clearer guidelines for appropriate travel speeds on different kinds of roads, and campaigns to change the public conversation about speed. The Panel supports the implementation of this programme.
- 40km/h part-time school speed zones have been implemented in many cities around New Zealand since 2001.
- Some local authorities have introduced lower speed limits (<50km/h), including Hamilton's Safer Speed residential areas and Wellington's shopping streets.
- Traffic calming and other physical speed management treatments are reasonably common around New Zealand; however, there is little national guidance on these and hence treatments are inconsistent and sporadic.
- Speed management in shared spaces (where cars are required to give way to cyclists and pedestrians); however, this lacks consistency.
- Expanding the network of speed cameras and red-light cameras through the Road Policing Programme, in partnership with the Transport Agency and local government.

## *The Panel recommends:*

### HIGH PRIORITY ACTIONS

- i. Ensure the needs of cycling are considered in the implementation of the Safer Speeds Programme.

### MEDIUM PRIORITY ACTIONS

- i. Reduce vehicle speeds by using traffic calming, self-explaining street treatments and lower speed limits around key destinations, such as schools and shops. Reduce speeds along key cycling network routes where separated facilities are not present and in local residential streets.
- ii. Reduce vehicle speeds on routes where cycle and freight traffic are unable to be separated.
- iii. Reduce and set more appropriate speeds on rural roads where cyclists are most at risk.



## SAFE ROADS AND ROADSIDES

### Improve the quality and quantity of cycling infrastructure

The Panel's main priority is improved cycling infrastructure. This requires funding, and the elevation of active transport needs in key planning and investment documents will improve the ability of road controlling authorities (RCAs) to access funds for cycling infrastructure projects. Risk identification tools including KiwiRAP, Urban KiwiRAP and Heat Maps, as well as the Crash Analysis System, are available to target investment to the highest-risk sites or routes first.

Cyclist deaths mostly result from cycle and motor vehicle crashes; cyclist-only crashes tend to have less serious injuries, although they are more common. Motor vehicle vs cyclist crashes are often caused by:

- not seeing (or looking for) other road users
- confusion and impatience at intersections
- misjudging other road users' speed or intentions
- poor infrastructure design or maintenance
- design guidance that balances travel time and safety (as opposed to prioritising safety over saving time)
- motorists infringing upon cycle lanes
- roadworks pushing cyclists into busy traffic.

*Also see the Safe Vehicles section for recommended enhancements to in-vehicle features.*

A consistent, continuous, convenient network of best practice cycling infrastructure would improve both actual and perceived safety, as would extra consideration being given to available road width on rural roads and intersection design. Improvements to intersections alone would significantly improve cycling safety.



Roadside sign indicating cycling training circuit. Photo by Karin Jones

### CYCLING SIGNAGE

A Victorian study found that many drivers held negative views towards cyclists, which ranged from unease and discomfort to impatience and frustration. Some respondents were adamant that cyclists should not be on the roads at all. They felt that cyclists were taking a risk and therefore any harm was the cyclist's own fault. A majority of drivers weren't aware that cyclists are permitted to ride two abreast and there were knowledge gaps in relation to other cycled related road rules. Attempts to overcome this attitude towards cycle athletes have been made in the Western Victorian region. A cycling training route around Wangoom, near Warrnambool, is clearly signed to alert drivers that cyclists will be in the area. This does not mean that cyclists have priority and are able to spread across the road, rather that drivers should expect to be sharing the roads (Johnson and Le 2012).

Adopting this approach and marking certain roads that are popular with cyclists could overcome safety concerns for both cyclists and motorists. Some of Taupo's popular cycle routes would be a good place to trial the Wangoom signage, together with applying appropriate speeds and removing pinch points.

International experience and evidence demonstrate that it is possible to substantially improve the safety of cyclists by providing well-designed cycling infrastructure. However, much of the infrastructure we have built in the past is now regarded as sub-standard, which can worsen safety. For instance, cyclists are not safer on narrow cycle lanes located near parked cars.

The strongest evidence supports the following kinds of infrastructure (OECD/International Transport Forum 2013):

## Separation

Ideally, cyclists should be separated from fast and busy traffic. High-speed rural traffic means that physically separated cycleways are the safest option and are preferred where there is high demand for cycling. Sealed road shoulders, while not as effective as full separation provide safety benefits to all other road users as well. The criteria for sealing road shoulders need to be revised to take into account cyclist use and risk.

Cyclists often use the road instead of separated paths and shoulders when they do not have a surface that is at least as smooth as the adjoining traffic lane. Such facilities need to be regularly swept free of debris and have a consistent width.

In cities, well-designed on-road infrastructure keeps cyclists visible, contributing to safety in numbers as well as a sense of security from crime. On-road physical separation of cyclists from traffic is well demonstrated internationally to improve midblock safety. However, it can increase injuries at intersections and driveways (where 74 percent of urban deaths and serious injuries occur) if not designed properly. This is due to drivers having poor awareness of cyclists re-merging with traffic from these separated cycle lanes to cross intersections, highlighting the importance of fit for purpose treatments at these danger points. Elevation of bicycle crossings has been shown to improve cyclist safety (Garder, et al 1998).

### Example of Auckland off-road connections

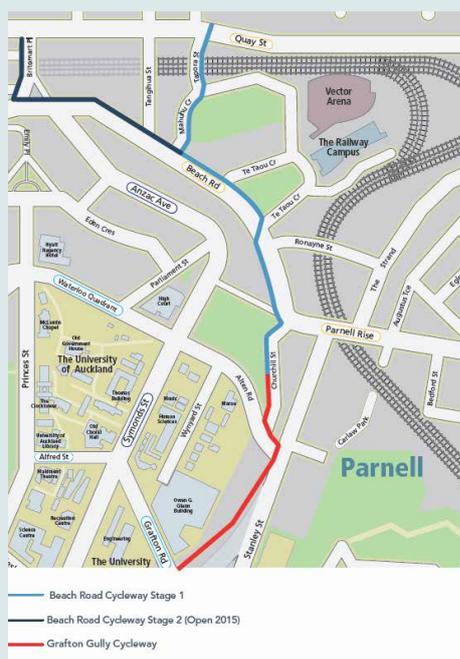
The NZ Transport Agency is working with Auckland Council and Auckland Transport to connect the North Western cycleway to the waterfront, in the heart of Auckland City.

The North Western Cycleway is one of the most popular cycleways in Auckland, with over 700 people on average using it each day. The existing route is approximately 9 kilometres in length and generally follows the alignment of the North Western Motorway (SH16), running from the western edge of Auckland's city centre to the Te Atatu peninsula.

With the recent completion of the Grafton Gully & Beach Road sections connecting to the Kingsland Cycleway, cyclists are now able to enjoy an almost entirely off-road journey between Waitakere and Auckland.

This route connecting Auckland International Airport and Auckland CBD will be the first of the NZ Cycle Trails' urban cycle routes.

The recent completion of the Beach Road portion of the project demonstrates a positive partnership between Auckland Transport and the community. Submitters were listened to and design changes were made as a result of the feedback.



## Roundabouts

Cyclists make up one third of killed and seriously injured roundabout users in New Zealand, whereas at other forms of intersection control, the casualty rate is about seven per cent (Wilke et al, 2014). New Zealand roundabout design follows guidelines designed to optimise motor vehicle movement and safety. In continental Europe roundabouts are designed to be more cycle friendly. They do this by ensuring that vehicles entering the roundabout have to slow right down to speeds consistent with pedestrian and cyclist safety. They also position cyclists more in the central vision of motorists. There would be value in trialling European roundabout designs in New Zealand. Signalisation of roundabouts also brings safety benefits for cyclists, and these could be considered more often. In the meantime, considerable care is required to accommodate cyclists when building roundabouts, and where multi-lane roundabouts are proposed, signals or grade separation for cyclists should be considered.

The Panel would like to see stronger linkage between cycle specific intersection and roundabout design, and Urban KiwiRAP and the High-Risk Intersections Guide (NZTA, 2013).

## Traffic signals

A recent Austroads project studied provision for cyclists at intersections controlled by traffic signals, which concluded that: (Austroads 2011)

- It is necessary to provide enough space for cyclists, squeezing in narrow lanes makes matters worse.
- Where the furthest left lane carries both through and turning traffic the risk is about four times higher than where there is a left-turn only lane or left-turn splitter island. Space should always be sought to achieve this.
- Cycle lanes of adequate width are beneficial, especially if the surface is coloured.
- Advance stop boxes have been proven to be beneficial.
- Hook-turn boxes at intersections provide for a safer right turn and appear to improve cycling safety.

## Current cycling initiatives

- Provision of an additional \$100m over 2014-18 from Crown funding for cycling infrastructure, with priority to be given to comprehensive, complete cycling networks in main urban centres.
- Trialling sharrows (shared lane cycle marking). This pavement marking includes a bicycle symbol and two white chevrons and is used to remind motorists that cyclists may share the lane.
- A National Active Modes Infrastructure Group has been set up by the Road Controlling Authorities Forum. The group is looking to achieve a more nationally consistent approach to implementing cycle-lane markings, signage and treatments.
- Transport Agency urban design guidelines on providing for walking and cycling (NZ Transport Agency 2013).
- Cycle network and route planning guide (Land Transport Safety Authority 2004).
- Non-motorised user review procedures interim guideline - for trial and comment (Selby and Lester 2006).
- Model communities, i.e. Hastings and New Plymouth.
- Future Streets in Mangere, Auckland (the research element of this project is funded by the Ministry of Business, Innovation & Employment).
- Cycling specific projects within the National Land Transport Programme, and cycling works included within other projects.
- Austroads, of which the Transport Agency is a member, has commissioned a study on roundabout safety.



The New York City Department of Transportation (NYCDoT) reports a 29 percent decline in people killed or severely injured since 2001. This figure includes all road users – pedestrians, cyclists, motorcyclists, drivers and passengers.

*The fundamental characteristic of the successful projects is that they create the opportunity for drivers, pedestrians, and cyclists to move through the street network simply and easily, minimizing the unexpected, the confusing, and the potential for surprises.*

NYCDoT attributes its safer streets to the following five key design rules:

- Make the street easy to use by accommodating desire lines and minimising the complexity of driving, walking, and biking, thus reducing crash risk by providing a direct, simple way to move through the street network.
- Create safety in numbers, which makes vulnerable street users such as pedestrians and cyclists more visible. The same design principle, applied to arterial streets when traffic is light, reduces the opportunity for excessive speeds.
- Make the invisible visible by putting users where they can see each other.
- Choose quality over quantity so that roadway and intersection geometries serve the first three design principles.
- Look beyond the (immediate) problem by expanding the focus area if solutions at a particular location can't be addressed in isolation.

New York City Department of Transportation (2013)

*The Panel recommends:*

## HIGH PRIORITY ACTIONS

- i. RCAs accelerate the provision of consistent, continuous, convenient and complete urban cycle networks, in keeping with best evidence – a whole of journey approach.
- ii. RCAs widely implement established best practice intersection treatments and trial European roundabout design guidelines and other innovative approaches, in alignment with KiwiRAP (see the Glossary).
- iii. RCAs identify urban and rural high-density freight routes popular with cyclists. Where possible, consider alternative routing, for either freight or cycling. Where this is not possible, manage travel speeds and/or provide physical separation, intensive intersection treatments and wide protected turning and passing lanes. Align and prioritise this work with the New Zealand Cycle Trail's Network Expansion Project.
- iv. RCAs progressively remove parking from arterial roads where it is a safety risk. Under the One Network Road Classification (ONRC), develop nationally consistent parking guidelines for arterial roads and other key cycling routes.
- v. The Transport Agency develop consistent national guidelines and descriptions for cycling infrastructure and align relevant legislation where this is necessary.

## MEDIUM PRIORITY ACTIONS

- i. Improve rural space management, which includes shoulder widening and smooth surfacing, sight distance improvements, road markings, maintenance and regular debris removal on key cycling routes. Align this work with KiwiRAP by developing a cycling component.
- ii. Improve roadside maintenance in urban areas.



## SAFE ROAD USE

### Trial mandatory minimum passing distances for motor vehicles overtaking cyclists

Cyclists, particularly those on the open road who are being overtaken at high speeds, are vulnerable to being squeezed off the road, sucked towards passing trucks or hit by the vehicle overtaking them. Cyclists are reliant upon balance, and may wobble and fall if their space is impinged upon. While circumstances can differ and result in varying 'safe distances', the Panel advocates specifying a distance that will be safe in almost any circumstance. A key benefit of this is that it informs motorists as to what is safe and can be used as a valuable education and enforcement tool.

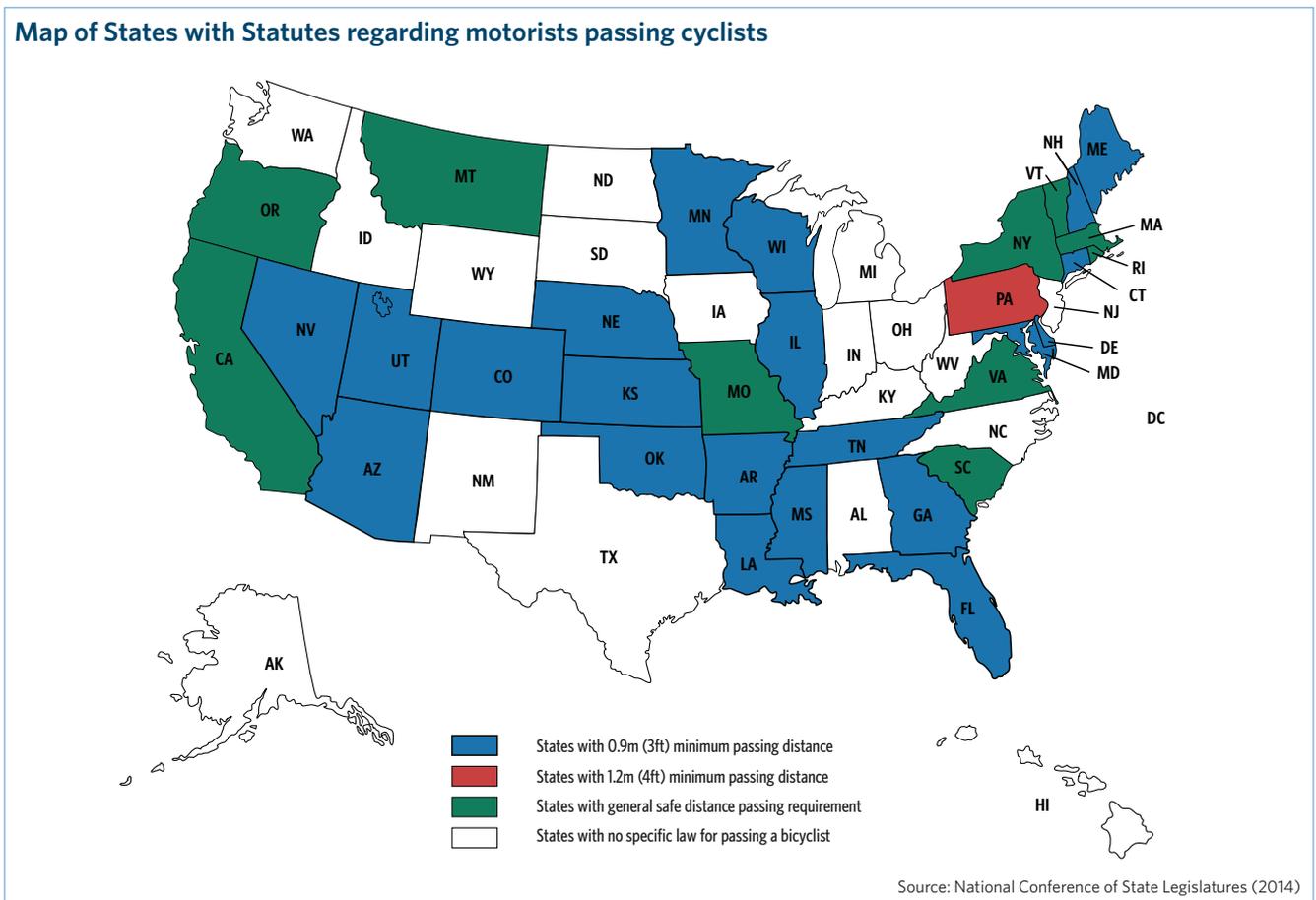
In conjunction with the Ontario Coronial Cycling Death Review in 2010, an amendment to the Ontario Highway Traffic Act was proposed to include safe

passing distances between motorists and cyclists. **'The purpose of this Act is to educate the public and in particular motorists about the safe passing of cyclists and to provide the police with both an educational and enforcement tool that will reduce injuries and fatalities.'** (DiNovo 2010)

On 7 April 2014, Queensland introduced legislation to trial a 'minimum passing distance of at least 1m in a 60km/h or less speed zone and 1.5m if the speed limit is over 60km/h for motorists passing cyclists'.

'Other road rules have also been changed to allow motorists to cross centre lines, straddle lane lines or drive on painted traffic islands to make it easier for them to pass cyclists, when it is safe to do so.

This change will be trialled for 2 years to test how the 1m and 1.5m minimum passing distance works in practice' (Department of Transport and Main Roads, Queensland Government 2014). Australian drivers will be penalised three demerit points and given a AU\$341



fine if in breach of the minimum distance when passing a cyclist. If the matter goes to court, a maximum fine of AU\$4,554 can apply.

In 1973, Wisconsin became the first US state to enact such a law. Many states in the USA have since passed minimum three feet (0.9 metre) passing distance laws. Pennsylvania has extended this distance to four feet (1.2 metres) (National Conference of State Legislatures 2014).

While enforcement can be challenging, there are instances, similar to the following distance rules, where this law will be of value when witnesses can report there was no question that an event resulted from a passing distance of significantly less than one metre. Such a law also helps to inform discussion on appropriate driving behaviours, such as motorists waiting behind cyclists if necessary, passing at a safer slower speed, or clearly using the opposing traffic lane to overtake rather than trying to 'squeeze' past in the same lane. Although enforcement is subject to proving a breach of the minimum, it is a tool the Police and other agencies can use that sends a strong message to motorists.

### Current cycling initiatives

- Minimum passing distances are included as a guideline in the Road Code. Also refer to careless/dangerous driving provisions in the Land Transport Act 1998 and Land Transport (Road User) Rule 2.6 on passing safely.



(Source: Queensland Government, Brisbane)

*The Panel recommends:*

### HIGH PRIORITY ACTIONS

- i. Trial mandatory minimum passing distances when drivers overtake cyclists (one metre is suggested for speed limits up to 60km/h, and 1.5 metres for speeds that are 61km/h and above).

## SAFE ROAD USE

### Increase cyclist safety around commercial vehicles

#### Why workplace safety matters to the Panel

As noted in the Executive Summary while cars remain the greatest source of risk for cyclists, trucks are disproportionately represented in cyclist crashes involving death or serious injury – regardless of who is at fault. Factors increasing death and serious injury risk include the obvious size disparity between cyclists and trucks, truck blind spots, and the ‘wind’ created by trucks, which may cause a cyclist to wobble and either fall onto the road shoulder or underneath the truck.

As well as improvements to roads and roadsides, speed management and vehicles, there are steps that both cyclists and truck drivers can take under the ‘Safe Use’ element that would improve safety. Including cyclist safety in workplace policies and practices is essential for truck drivers and their relevant business owners or employers.

The Pike River tragedy of 2010 has highlighted the importance of taking a whole-of-system approach to safety in the workplace. A key recommendation from both the Royal Commission on the Pike River Coal Mine Tragedy and the Independent Taskforce on Workplace Health and Safety was the need for an independent workplace health and safety regulatory agency – WorkSafe New Zealand was established for this purpose.

WorkSafe NZ is guided by the Health and Safety in Employment Act 1992 and promotes a range of measures to improve workplace safety. In addition, the Business Leaders’ Health and Safety Forum is a coalition of business and government leaders committed to improving the performance of workplace health and safety in New Zealand. Their vision is ‘... all business leaders passionately committed to achieving Zero Harm Workplaces’.

#### Commercial vehicles are a place of work

Under the 1992 Act:

**person who controls a place of work** in relation to a place of work, means a person who is—

(a) the owner, lessee, sublessee, occupier, or person in possession, of the place or any part of it...

**place of work** means a place (whether or not within or forming part of a building, structure, or vehicle) where any person is to work, is working, for the time being works, or customarily works, for gain or reward;

The emphasis of the law is on the systematic management of health and safety at work. It requires employers and others to maintain safe working environments, and implement sound practice. It recognises that successful health and safety management is best achieved through good faith co-operation in the place of work and, in particular, through the input of those doing the work.

From WorkSafe NZ <http://www.business.govt.nz/worksafe/information-guidance/legal-framework/hse-act-1992>

## The Health and Safety Reform Bill increases the duties on both employers and workers for workplace safety

Following on from the Independent Task Force Review and the establishment of WorkSafe NZ the government has also reviewed the workplace health and safety legislative framework resulting in the Health and Safety Reform Bill introduced in March 2014.

Specifically, the Health and Safety Reform Bill will:

- Put more onus and legal requirements on managers and company directors to manage risks and keep their workers safe.
- Require greater worker participation so workers are more involved in health and safety in their workplace.
- Establish stronger penalties, enforcement tools, graduated offence categories and court powers.
- Amend the WorkSafe New Zealand Act 2013, Hazardous Substances and New Organisms Act 1996, Accident Compensation Act 2001, Employment Relations Act 2000 and other Acts

The Health and Safety Bill will create the new Health and Safety at Work Act, replacing the Health and Safety in Employment Act 1992. It is expected to pass into law by the end of the year and will come into force in April 2015.

The Bill will be supported by two phases of regulations, expected to be released for consultation later this year.

WorkSafe New Zealand will support businesses and workers in the transition and beyond with education and information.

From a media release by the Hon Simon Bridges, Minister of Labour, 10 March 2014 <http://www.beehive.govt.nz/release/health-and-safety-reform-bill-introduced>

## An opportunity to improve workplace policies and practices to reduce risks for cyclists

The Panel considers that the new legislation provides an important opportunity to expand and strengthen awareness of cycling safety issues among the road freight industry and drivers and promote measures to reduce risk. We would like to see stronger incentives that reward responsible businesses, whether large companies or owner-operators, for taking a pro-active approach to cycling safety. At the same time, of course, we agree with the Road Transport Forum that there is scope to increase cyclists' awareness of the specific dangers of riding near heavy vehicles and how to keep themselves safe. This is addressed later on in the section on improving road user attitudes and behaviours (pp. 42-43).

### Current Cycling Initiatives

- The Cycling Advocates' Network has been running road user workshops for a number of years where commercial bus and truck drivers come together with regular cyclists to literally 'sit in each other's seats'. They discuss how best to interact with each other on the road in an empathetic, non-confrontational setting. To date, over 300 commercial drivers have been through this programme.
- The NZ Transport Agency has recently set up a Road User Workshop Working Group as a deliverable through the Road Safety Trust contract "Safer Journey for those who cycle". Members include: Heavy Transport Operators, Bus and Coach Operators, Cycling Advocates' Network, NZ Police, Taxi Federation, Accident Compensation Commission, Territorial Local Authorities, BikeNZ and the Transport Agency. Essentially the purpose is for the group to own and share the responsibility for the issues involving cyclists and heavy vehicle drivers.



## Other relevant programmes

- The **Fleet Safety** programme is a partnership between the ACC, the Transport Agency, New Zealand Police and WorkSafe NZ under Safer Journeys. Safer business vehicle fleets contribute to a safer vehicle fleet overall. The Fleet Safety programme proactively targets businesses that can most benefit from improving their fleet safety. It does this by analysing a fleet's traffic infringement, crash and other fleet statistics held by the Police and the Transport Agency, then combining them with ACC injury claims and MBIE employer data.
- ACC also runs **Fleet Saver** – a complete package covering workplace, on-road and in-cab safety, the programme offers levy reductions to eligible businesses who demonstrate a strong safety culture and a commitment to the highest standards of safety among their employees. The programme is designed for businesses who own five or more vehicles weighing more than 3,500kg each and can demonstrate strong safety management practices. Through the programme, businesses can reduce their ACC motor vehicle levies by 10 – 40%. See [www.acc.co.nz/for-business/small-medium-and-large-business/how-to-pay-less/fleet-saver/index.htm](http://www.acc.co.nz/for-business/small-medium-and-large-business/how-to-pay-less/fleet-saver/index.htm)

## Trucks you want to be around – ACC's Fleet Saver Programme

### GIVE YOUR BUSINESS A VISIBLE ADVANTAGE

There are three levels of ACC Fleet Saver accreditation through which your business can progress, from entry level Bronze to Silver and Gold. A particular level may be more appropriate to your specific business than the others, but all carry the same prestige.

Depending on the level your business achieves, you'll receive either Bronze, Silver or Gold accreditation badges for each vehicle in your fleet.



Fonterra's commitment to driver training, health and safety shows how safety can become part of a company's brand



More than a driver, our Tanker Operators are the face of Fonterra at the farm-gate and on the road. They are professional drivers, with high industry standards and a commitment to everyone's health and safety.

[www.fonterra.com/global/en/Hub+Sites/Careers/Tanker+Drivers/Our+Tanker+Drivers](http://www.fonterra.com/global/en/Hub+Sites/Careers/Tanker+Drivers/Our+Tanker+Drivers)



## Companies across Britain implement Crossrail lorry safety requirements

Crossrail builds rail infrastructure in Britain, with a heavy emphasis on London. A joint road safety event between the company and police is Exchanging Places, held on London roads and in schools. It gives cyclists the chance to sit in a lorry driver's seat and understand the blind spots faced by Heavy Goods Vehicle (HGV) drivers.

*Crossrail's rigorous safety requirements for any HGV working on their projects is leading to widespread change in the UK haulage industry as vehicles are upgraded with new safety equipment to alert drivers to vulnerable road users. Crossrail requires all HGVs delivering to its worksites to have cycle safety equipment and for regular drivers to undergo a one day intensive training course regarding vulnerable road users. Lorries are inspected when arriving at site to ensure the required safety equipment is fitted and in working order.*

*Crossrail requirements include that HGVs are fitted with Fresnel lenses or cameras, blind spot detection equipment that warns the driver when a cyclist is in the near-side blind spot and under-run guards to prevent cyclists from coming into contact with lorry wheels. Vehicles must also carry warning signs to alert cyclists and pedestrians of the risks they face by getting too close to HGVs.*

Eleftheriou (2014)

*The Panel recommends:*

### HIGH PRIORITY ACTIONS

- i. a) All employees who drive a heavy vehicle as the primary activity of their employment must receive cycle safety-specific driver training; and  
  
b) develop and provide training and resources for cyclists to raise awareness of the risks of riding near heavy vehicles.

### MEDIUM PRIORITY ACTIONS

- i. Work with the freight industry to improve safe driving practices and vehicle standards.
- ii. Extend the Cycling Advocates' Network delivery of cycle/bus/truck workshops.
- iii. Use ACC levies and insurance premiums to reward corporate responsibility and actions to improve cycle safety.



## SAFE ROAD USE

### Increase the safety of cycling to school through a package of Safe System measures

Only a small percentage of children are being taught cycling skills and these skills are often not adequate to cope with most traffic situations. The majority of skills training is at grade 1 level, which has no on-road component. The grade 2 courses give children confidence and the skills to cycle in a variety of traffic environments and the Panel would like to see more of grade 2 delivered. Adults are even less likely to have received some formal cycle skills training, and currently there are very few opportunities around the country for adult riders of any level of experience to obtain training by certified instructors. High-quality international assessments of the current evidence about cycle skills training and school travel planning conclude a lack of evidence of effectiveness at improving safety or participation outcomes for both these interventions.

Intuitively it would seem self-evident that better cycle skills will reduce crash risk, especially with two thirds of crashes not involving a motor vehicle.

Despite the lack of solid evidence in this area the Panel considers cycle skills training and education regarding the key risks for people who cycle will improve safety outcomes where the school route infrastructure is improved.

As referenced earlier, more people cycling improves all road users' safety outcomes and teaching a young person cycle skills is far more practical than trying to teach adults, given the difficulty of attracting adults to cycle skills courses.

A 2009 study found that 8.6 percent of intermediate school students surveyed cycled to school, but 22.2 percent wanted to (Mackie 2009).

School	Approx % cycling	% of students who would like to bike to school	Theoretical max % cycling A (a)	Theoretical max % cycling B (b)
Avondale Intermediate	1%	17%	20%	55%
Kowhai Intermediate	7%	24%	14%	23%
Wesley Intermediate	2%	13%	31%	58%
			<b>(c)</b>	<b>(d)</b>
Devon Intermediate	14%	35%	29%	58%
Tauranga Intermediate	8%	23%	17%	34%
Mount Maunganui Intermediate	20%	N/A	16%	36%
Average (SD)	8.6% (6.3%)	22.2% (8.3%)	21.5% (8.6%)	44% (15.0%)

(a) Not including pedestrians, public transport users and those who live greater than a 2km radius from school

(b) Including pedestrians, public transport users and those who live greater than a 2km radius from school

(c) Students who live within a 0.75-2km radius from school on reasonable cycling routes

(d) PLUS all students who live more than a 2km radius from the school on good cycling routes



## Current cycling initiatives

Government is co-investing in cycle skills training and providing guidance on school travel planning. However, delivery is inconsistent and limited.

Bikes in Schools is a biking package implemented within a school that enables all students to ride a bike on a regular basis. It is targeted at lower decile primary schools, often with a large Māori and Pacifica student population. The package includes new bikes, helmets, riding and pump tracks within the school grounds and a storage facility. A bike coach is used to introduce the programme and teach basic riding skills. There are currently over 30 schools utilising the Bikes in Schools package.

The Panel likes the Bikes in Schools model where children who may not otherwise have the opportunity to cycle can learn to ride a bike in a safe-school playground-environment. The Panel would like to see more research on the impact on the children partaking in Bikes in Schools, in terms of numbers cycling outside the school grounds, crash incidence versus non-Bikes in Schools children and general health outcomes.

### Orewa College cycle training

In February 2014, Harbour Sport delivered a one-day cycling programme to 447 Year 7 and 8 Orewa College students. The evaluation indicated a 26 percent increase in bike and road user knowledge and a 24.2 percent increase in being able to ride in a straight line.

Students reported a 29 percent increase in feeling 'very confident', and a 12 percent decrease in 'not confident'.

Following the cycle training, a bike rack count revealed that 52 (11 percent) year 7 and 8 students were cycling to school, an increase from 6 percent (27 students) since 2013.

The Transport Agency, other road controlling authorities, the Ministry of Education and School Boards of Trustees should collaborate to increase the availability and quality of cycle skills training in schools. Cycle skills training should have an increased focus on grade 2 and above to school-aged children, as this level has a greater emphasis on on-road riding and dealing with traffic and intersections.

### *The Panel recommends:*

#### HIGH PRIORITY ACTIONS

- i. Create and implement comprehensive school travel planning packages incorporating improved routes to schools, appropriate speed limits, community engagement and increased access to cycle skills training.

#### MEDIUM PRIORITY ACTIONS

- i. Developing the Bikes in Schools model further to ensure the longer-term success within schools, ongoing funded training assistance and bike maintenance and integrating Bikes in Schools with an increase in grade 2 cycle skills training.



The Christchurch City Council funds the Cycle Safe Programme for year six pupils (10–11 years old); it has been running since 1998. During the 1980s, the Ministry of Transport Road delegated cycling instruction to classroom school teachers. However, the instructors required for the high ratio of one instructor for six pupils for on-road instruction were unavailable. Concerns that a generation of children would miss out on essential safety skill training led the Christchurch Road Safety Co-ordinating Committee to set up a programme.

Two full-time and a pool of part-time instructors were employed to deliver the on-road component of the Cycle Safe Programme. The programme’s popularity

required the addition of a second team in 1999; ever since approximately 90 percent of children in year 6 have been trained to ride their bicycles with confidence and be road-wise. Of those children who received cycle training, 95 percent achieved competencies assessed at grade 2.

Christchurch’s Cycle Safe Programme is considered one of the best in the country and is used as a leading delivery model. In 2007 the Cycle Safe team worked with Land Transport NZ to develop the current national cyclist skills training guidelines. The course usually takes 10 and a half hours, made up of seven modules of 90 minutes each, including seven hours of on-road instruction.

An independent evaluation has shown that the children are learning and using the cycle skills and those who pass the test are more likely to have parents who permit them to ride to school.

Assessment of Police reported crashes of 11-13 year old cyclists, following the introduction of Cycle Safe:			
Year cyclist turned 10 years old	1994-97	1999-2002	2003-06
Christchurch City	No on-road training 64 injury crashes	On-road training: 39 injury crashes 39% reduction	On-road training: 21 injury crashes 67% reduction
Other comparable cities with minimal school based training.		No training 25% reduction	No training 32% reduction

Note: This table follows the subsequent crash history when aged 11-13, of children who turned 10 years old in the years shown, before and after the Christchurch Cycle Safe programme began in 1998. So if a child turned 10 in 2002, the crashes when they turned 11-13 would appear in the 1999-2002 column.



## SAFE ROAD USE

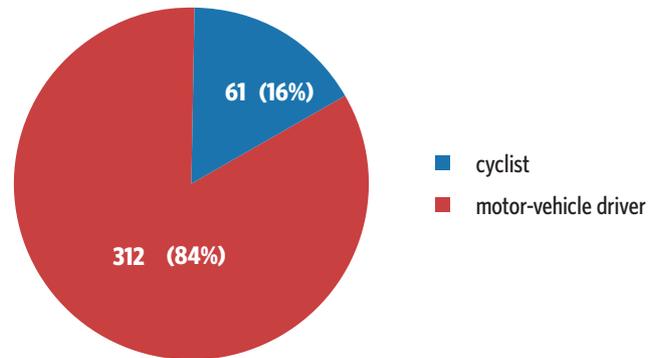
### Improve road user attitudes and behaviours

Many crashes are caused by inattention, inappropriate behaviour (whether intentional or not) and lack of knowledge by both motorists and cyclists. The Safe System approach starts from the principle that 'people make mistakes', meaning that human error needs to be accommodated within a forgiving road system that manages crash forces to survivable levels. The safe road use element of the approach aims to reduce human error or to minimise its effects, while recognising that it cannot be entirely eliminated. Although safe road use can be encouraged through safe roads and roadsides, safe travel speeds and safe vehicles, this section considers actions aimed mainly at attitudes, behaviour and regulation.

Some motorists find cyclists unpredictable and inconvenient (Ngatuere 2014). The Panel notes that where the road system makes inadequate provision for cycling, conflict points and tensions can develop more easily on both sides. With improved infrastructure, sharing the road would become much easier.

Road user guidance already exists, but is not obvious or easily accessible to road users. The Road Code includes a chapter advising motorists on how to share the road with cyclists and advises cyclists on safe road use practices. Many road users do not seem to be aware of the finer points of this guidance, which contributes to misunderstandings, antagonism and crashes. Additionally, some legislation is ambiguous or changes with circumstances, for example overtaking on the left when riding.

### Party that failed to give way in urban fatal and serious cyclist crashes (2008-12)



#### Current cycling initiatives

- See the Person, Share the Road public awareness campaign. The Transport Agency website also contains tips for motorists about sharing the road with cyclists
- Road Code (general)
- Code for Cyclists
- Bike Wise funded by the Transport Agency, is New Zealand's national programme of cycling activities. It is supported by the Bike Wise Reference Group, which includes representatives from BikeNZ, Cycling Advocates' Network, New Zealand Police, Ministry of Transport, ACC and several others.
- Safety tips for cyclists and truck and bus drivers: This leaflet provides some practical advice on how cyclists, buses and trucks can share the road together safely.
- With funding from the Road Safety Trust, Bike NZ and Cycling Advocates' Network deliver 'Making the journey safer for people who cycle'. This project has a clear aim of targeting high-risk areas for cycling in New Zealand to improve road safety outcomes by training and certifying instructors for cycle skills training, holding road user workshops for commercial drivers and cyclists, and developing informational material on safe road use behaviours when/near cycling.



### Alcohol-impaired cycling

Negative road user behaviour that is not normally associated with cycling is inappropriate alcohol consumption. The Land Transport Act only requires that drivers of motor vehicles restrict their blood alcohol content to prescribed levels, leading some people to think that cycling home from the pub is the safer option. As advised by Alcohol Healthwatch, several cyclists are killed each year because of alcohol-related impaired judgment (Huhn 2013; Crocker et al 2010). The data in this area is weak and the Panel would like more information to gauge the magnitude of this issue.

### *The Panel recommends:*

#### HIGH PRIORITY ACTION

- i. The Transport Agency develop a best practice communication programme to promote 'sharing the road safely' to cyclists and motor vehicle drivers.

#### MEDIUM PRIORITY ACTIONS

- i. Add questions to the driver licence test regarding passing cyclists and interaction with pedestrians and cyclists. Investigate if driving instructors are appropriately qualified, and have relevant resources, to teach young drivers to be mindful of cyclists.
- ii. Create adult cycling training opportunities.
- iii. Collect information on impaired cycling, with a particular focus on blood alcohol content.

#### Other safe use issues

**Helmets** The Panel had several discussions on the law applying to helmet wearing in New Zealand and received a number of submissions advocating for a change from the current mandatory wearing of helmets. While the Panel considers increasing the number of people who cycle will reduce personal injury

risk there is not enough evidence that changing the helmet law would see a sufficient increase in cycling to offset the increase and severity in head injuries that would result from fewer people wearing helmets. In particular the Panel notes that two-thirds of on-road crashes do not involve a vehicle, and often in these instances wearing a helmet can mean the difference between a nasty shock with an accompanying headache and a long-term brain injury or death. Therefore the Panel does not agree that cyclist safety would be improved by revoking legislation that makes helmets compulsory, and supports the status quo.

**High-visibility clothing** is an issue often raised by Coroners and journalists. The Panel encourages people to wear bright clothing and reflective garments when cycling (especially in busy or dark environments), but does not support suggestions that these be mandated. Available research does not demonstrate a significant cause and effect between wearing high-visibility clothing and reduced risk of death or serious injury (Tin Tin et al 2014; Koorey 2014).

**Riding two abreast** Some submitters suggested that if mandatory minimum passing distances were trialled then cyclists should no longer be allowed to ride two abreast. The Panel does not agree with this view or that it is a valid 'trade off' for minimum passing distances. The Road Code already provides that cyclists should move back to single file if necessary to allow other traffic to pass. Talking to other cyclists makes cycling a more enjoyable social activity as well as a means of transport. Parents and trainers usually need to ride alongside learner riders for safety and to provide guidance. Riding two abreast also helps cyclists to be more visible.



## SAFE ROAD USE

### Review road rules that may be putting cyclists at risk

Many existing traffic regulations were designed largely with motorists and pedestrians in mind; often they are not equally sensible when cyclists are involved. One example is the prohibition of encroaching on a flush median to overtake a vehicle in Road User Rule 2.6 under the Land Transport Act 1998. New Zealand research shows that cyclists are actually safer if vehicles were permitted to do so (Turner et al, 2009). In the case of no passing lines the current Road User Rule 2.9 has caused confusion in practice by stating that motor vehicles may not cross a no-passing line to pass another motor vehicle or a horse drawn vehicle. This has been wrongly interpreted as extending the prohibition to passing cyclists. Crossing the no-passing line to pass a cyclist is not prohibited provided all the other requirements of safe passing are met. Making the rule in relation to cyclists more explicit would help all road users. Publicity after such rule changes could then encourage motor vehicle drivers to leave a safe distance when overtaking cyclists, without fear of infringement.

Other issues requiring review include providing separate cyclist only phases at traffic signals, overtaking on the left, riding between traffic lanes, riding on footpaths and using pedestrian crossings.

A legislative review of provisions for vulnerable road users was initiated in 2006 but never completed. Work on changes to the give way rules, graduated driver licensing and drink driving took precedence. Now that the changed give way rules and stricter drink-driving rules have been implemented, the Panel recommends that the earlier work be refreshed and completed, perhaps in conjunction with an investigation of any trial mandatory minimum passing distances.

The flush median and no-passing line examples above present opportunities for 'quick wins' using the regular omnibus process for minor regulatory changes.

## *The Panel recommends:*

### MEDIUM PRIORITY ACTIONS

- i. Amend:
  - Road User Rule 2.6 to provide that a motor vehicle may encroach on a flush median to overtake a cyclist if it is otherwise safe to do so; and
  - Road User Rule 2.9 to provide expressly that a motor vehicle may cross a no-passing line to pass a cyclist if it is otherwise safe to do so.
- ii. Revisit and revitalise legislative recommendations from the work on vulnerable road users commenced in 2006. This could be done in conjunction with work to mandate minimum passing distances.

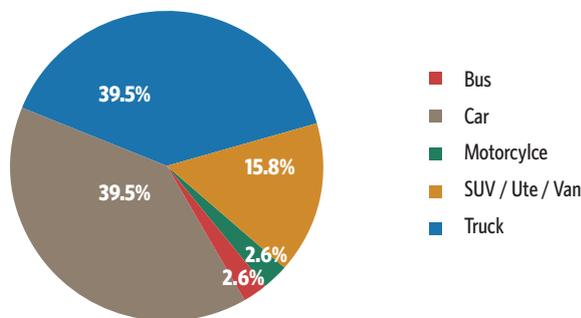


## SAFE VEHICLES

### Investigate the safety benefits of truck side under-run protection and other vehicle features

Although cars and other light vehicles make up a greater proportion of vehicles involved in cyclist deaths than trucks, trucks are still over-represented in crashes causing cycling deaths and serious injuries. Between 2003 and 2012, trucks were involved in 33 percent of urban cyclist deaths. The seriousness of trucks mixing with cyclists has recently seen Transport for London ban unauthorised heavy vehicles from the central city (see next page). As well as the roads and roadside measures already recommended, there is scope for in-vehicle enhancements to reduce both the risk and severity of such crashes.

**Vehicles involved in urban cyclist deaths 2003-12**



The Ministry of Transport has reviewed literature on side under-run protection systems (SUPS) and concludes that 'the evidence suggests that existing SUPS designs have been effective at reducing the severity of injury sustained by cyclists in collision with heavy goods vehicles'. A preliminary analysis of recent cycle-truck crashes in New Zealand suggested a statistically significant reduction in the incidence and severity of such crashes had SUPS been present; further investigation would also be useful to assess whether additional benefits of SUPS to pedestrians, motorcyclists and light motor vehicles might also be obtained.



From April 2015 Boston City Council will require city-contracted trucks over 4.5 ton to be equipped with side guards. (Source: Boston Public Health Commission)

Given the prevalence of SUPS in comparable jurisdictions and evidence of their effectiveness, the Panel considers that the issue is worthy of further investigation in the New Zealand context. We note that further investigation would require close consultation with freight operators and representative organisations on whether SUPS should apply to new vehicles only and options for funding or other financial incentives, together with detailed cost-benefit analysis.

In addition to SUPS, other technological safety features can improve visibility and communication between trucks and cyclists. British supermarket chain Sainsbury's has added several features to its truck fleet. These include proximity sensors along the sides of the vehicle to alert the driver to other road-users, cameras on the front, rear and side of the truck and extended side and rear guards to stop cyclists from getting trapped under the wheels. To avoid crashes when trucks turn left across the path of cyclists, LED indicators will make it clearer when a truck is planning to turn left and a large warning sticker will tell cyclists when they are in the driver's blind-spot (Withnall 2014).



Graphic showing (1) the system of front, rear and side cameras; (2) new proximity sensors and LED indicators; (3) extended side and rear guards with reflective infills. (Source: Evening Standard)

### London Safer Lorry Scheme

Between 2008 and 2012, 53 percent of cycling fatalities in London involved lorries, though they make up only around 4 percent of the traffic. National legislation requires trucks to fit side guards and extended mirrors, but exemptions are allowed to skip operators with vehicles under 18 tonnes and a large number of these exempted vehicles are killing cyclists.

The safety equipment for the Safer Lorry Scheme is defined as:

Class V and VI mirrors will be required by all HGVs over 3.5 tonnes irrespective of current exemptions

Side guards will be required for all vehicle types, irrespective of current exemptions.

Basic safety equipment is relatively inexpensive, especially when compared to typical heavy vehicle purchase and operating costs. A close proximity mirror costs around £300 and side guards around £1,000, including installation.

Transport Research Laboratories (2014) estimate that, for collisions with HGVs without side guards where the impact point is at the side of the lorry and the vehicle manoeuvres are going ahead in a straight line, then between 50 percent and 74 percent of cycling fatalities may be prevented if side guards had been present.

Transport for London (2014)

*The Panel recommends:*

### HIGH PRIORITY ACTIONS

- i. The Ministry of Transport and the Transport Agency, in consultation with industry representatives, complete investigations of the cost-effectiveness of truck side under-run protection and other vehicle technology improvements such as collision detection systems, additional mirrors or cameras.



## SAFE VEHICLES

### Improve standards for bicycle lights and e-bikes

#### Bike lights

Lack of cyclist conspicuity is one of the biggest factors contributing to a crash. A well-lit bicycle is one of the easiest ways for a cyclist to be more visible at night and reduce the risk of a crash.

The quality and brightness of bicycle lights has changed dramatically over the last decade. There is now a wide range of lights available from dazzling to dim, which can lead to frustration and confusion on the part of all road users. While dazzling lights are not showing up in CAS data as a contributing factor to bicycle crashes, lights that are too dim or no lights at all are a regular contributing factor. The use of dim lights (compared with no lights) may increase crash risk due to risk compensation behaviour.

New Zealand has no technical standards that apply to bicycle lights for sale. New ISO standards are currently being developed. These will control the lights available for purchase in the countries that choose to adopt them.

For bicycle light performance on public roads, Land Transport Rule: Vehicle Lighting 2004, Rule 32005 applies and may be enforced by the Police. This requires that bicycle lights be visible from 100m in fine conditions, between 30 minutes after sunset and 30 minutes before sunrise. These requirements are so weak that even the poorest lights on the New Zealand market will pass. By comparison, the Australian regulation requires that bicycle lights be visible from 200m between sunset and sunrise.

#### Electric bicycles

Electric bicycles (e-bikes) are not an issue, yet. Based on e-bike sales in Asia, Europe and Australia over recent years, e-bike sales in New Zealand are likely to increase dramatically in the near future. Approximately 10,000 e-bikes were sold in Australia in 2013.

As no standards are in place to regulate the speed of an e-bike, an issue could arise where unlicensed people (including children) are riding e-bikes that are very similar to motorbikes.

In response to growing concerns over e-bike safety, the Australian government has adopted the European Standard for Power Assisted Pedal Cycles (EN15194), which requires pedalling to activate the motor and cuts power to the motor once a speed of 25km/h is reached. The standard also limits the electric motor power to 250 watts – any higher and the bike faces similar regulation to mopeds. E-bikes meeting the European standard are almost twice as likely to be involved in a crash than a classic bicycle, but it appears the risk is limited by the restrictions (Schepers et al 2014).

New Zealand regulations limit e-bike motor power to 300 watts, and there is no cut-out at any speed. Despite the extra challenges involved in controlling an e-bike, there is no age limit for e-bike use in New Zealand. In the United Kingdom, where e-bikes are typically limited to 200 watts, riders must be at least 14 years of age<sup>3</sup>.

#### Current cycling initiatives - bicycle lights and e-bikes

- Bicycle light requirements are contained in the Land Transport Rule: Vehicle Lighting 2004, Rule 32.
- Be Bright campaign is run by Bikewise and many Councils around New Zealand: [www.gw.govt.nz/be-bright/](http://www.gw.govt.nz/be-bright/)
- Greater Wellington Regional Council and Consumer NZ have undertaken bicycle light testing.

<sup>3</sup> [www.govt.nz/electric-bike-rules](http://www.govt.nz/electric-bike-rules)



*The Panel recommends:*

## **HIGH PRIORITY ACTIONS**

- i. Pending the development of a new international ISO bike light standard, the standard in the Land Transport Road User Rule be amended as follows:
  - when operated between sunset and sunrise or in low light conditions, [bicycles] must be fitted with lights that are visible from a distance of 200 metres (this may be steady or flashing).

Note: The existing provision that lights should not dazzle or confuse other road users would remain.

## **MEDIUM PRIORITY ACTIONS**

- i. Investigate the adoption of the new ISO bicycle lights standards (or a New Zealand adaptation).
- ii. Investigate the adoption of the European standard for Electrically Power Assisted Cycles (EN15194) in New Zealand.
- iii. Investigate an age limit for e-bike use on public roads.



# EVALUATION AND MONITORING – MEASURES OF SUCCESS

The Panel has discussed how the success of its recommendations can be measured. The main key performance indicators will be progressive reductions in on-road cycling fatalities until our Vision Zero is achieved, accompanied by on-going reductions in serious injuries. If these results are achieved alongside increasing participation in cycling, we will be very pleased with the results.

The Panel has not been established as an on-going performance monitoring body for cycling safety. Once central and local government have decided which recommendations will be implemented, it will be essential for their work programmes to include monitoring and evaluation requirements so that results can be measured and evaluated accurately. The Safe System approach involves continuous improvement

as lessons are learned about what works and what does not and then fed back to the next planning and investment round. The improvements in data collection and analysis suggested under recommendation 3 are vital to this process.

The Transport Agency has established a Cycling Team as well as an internal governance group. We understand that the new cycling team will have a large role in developing and overseeing the work programme flowing from government decisions on our recommendations. We are heartened by these developments.

The following table sets out possible performance measures for our recommendations:

Recommendations	Possible performance measures
Safety outcomes	<ul style="list-style-type: none"> <li>Reduction in death and serious injuries per kilometre travelled/time spent cycling/total numbers.</li> <li>Percentage increases in cycling deaths and serious injuries not to exceed/be less than any percentage increase in cycling participation.</li> </ul>
Perception outcomes	<ul style="list-style-type: none"> <li>Perceived safety of cycling, eg percentage of people who feel safe/unsafe while cycling.</li> <li>Reduced percentage of people who do not cycle because they think cycling is an unsafe activity.</li> <li>Reduced percentage of parents who think it is too dangerous for their children to cycle to school.</li> </ul>
Panel's work	<ul style="list-style-type: none"> <li>Number of panel recommendations implemented fully/partially by [date].</li> <li>Establishment of on-going monitoring mechanism/advisory body.</li> <li>Encouragement/support by a benchmarking programme.</li> </ul>
Safe roads and roadsides	<ul style="list-style-type: none"> <li>Establishment/enhancement of relevant design guidelines.</li> <li>Reduced risk of death and serious injury on roads where the infrastructure has been improved.</li> <li>Stocktake and ongoing measurement of various types of infrastructure for cycling (needs consistent national definitions) eg kilometres of segregated or off-road cycle paths.</li> </ul>

Safe speeds	<ul style="list-style-type: none"> <li>▪ Increased kilometres of roads, used regularly by cyclists, with lowered speed limits.</li> <li>▪ Reduced deaths and serious injuries where speeds have been lowered.</li> </ul>
Adoption of Safe System principles	<ul style="list-style-type: none"> <li>▪ Proactive recognition of cycling in planning and investment processes.</li> <li>▪ Increased investment (absolute/percentage) in improving actual/perceived cycle safety.</li> </ul>
Safe road use	<ul style="list-style-type: none"> <li>▪ Increased percentage of school children who receive cycling skills training to level 2.</li> <li>▪ More positive attitudes from motorists to cyclists and vice versa (increasing mutual respect and understanding).</li> <li>▪ Reduced deaths and serious injuries from crashes involving heavy vehicles and cyclists.</li> </ul>
Safe vehicles	<ul style="list-style-type: none"> <li>▪ Percentage of bikes with lights that meet standards.</li> <li>▪ Percentage of heavy vehicle fleet with side underrun protection.</li> <li>▪ Percentage of motor vehicles with collision warning/avoidance systems.</li> </ul>
Participation outcomes	<ul style="list-style-type: none"> <li>▪ Uptake cycling, eg kilometres cycled or time spend cycling (eg by age group, region), increased percentage of trip legs in the New Zealand Household Travel Survey. Increased participation is a sign that perceived fear has decreased.</li> <li>▪ Number of RCAs fully engaged with a benchmarking programme.</li> <li>▪ Increased percentage of commuters cycling to work (census data).</li> <li>▪ Increased percentage of children cycling to school (count the bikes in school bike racks).</li> </ul>



# APPENDIX I: TAKING A SAFE SYSTEM APPROACH

## A 'whole-of-system' approach to improving road safety for people who cycle

The Panel's Terms of Reference require it to take into account the Safe System approach to road safety, which the Government has adopted under *Safer Journeys: New Zealand's Road Safety Strategy 2010–2020*. The Panel has found this a useful framework. This section explains the whole-of-system approach in more detail to put the Panel's comments and recommendations into context.

The Safe System approach is usually illustrated by this diagram (Ministry of Transport 2010, p10):

The vision at the centre of the diagram of 'a safe road system increasingly free of death and serious injury' has been adapted by the Panel, to create a cycling specific vision, as set out earlier: 'a safe road network with zero fatalities and reduced serious injuries for people who cycle'.

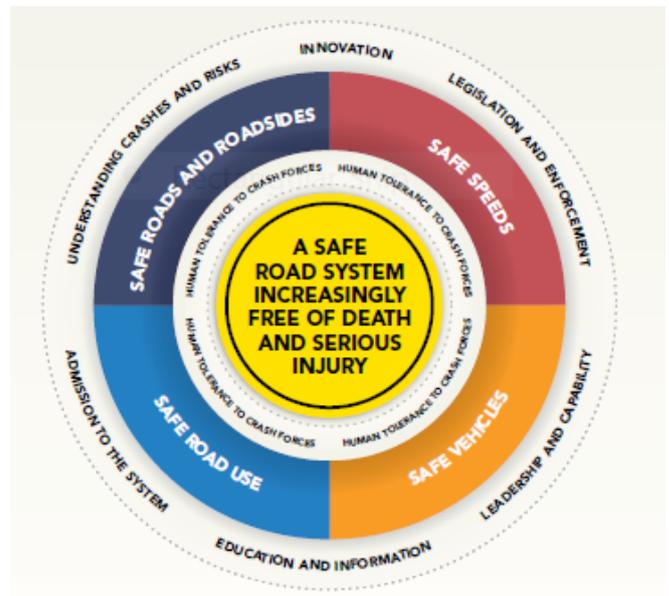
In New Zealand the Safe System approach also incorporates four principles:

**1** People make mistakes

**2** People are vulnerable

**3** We need to share responsibility

**4** We need to strengthen all parts of the system



### **Human tolerance to crash forces**

Next to the central vision is the recognition of 'human tolerance to crash forces' – this is the second of the four principles – people are vulnerable and have limited tolerance to crash forces. Therefore, the rest of the road system has to be designed around managing crash forces so that people are not killed or seriously injured.

### **Elements of the Safe System approach**

The coloured segments in the circle diagram are the 'elements' or 'pillars' of the Safe System:

- safe roads and roadsides
- safe road use
- safe vehicles
- safe speeds

All the elements need to take into account the principles – particularly that 'people make mistakes'.

### **Shared responsibility and strengthening all parts of the system**

The outermost ring of the diagram links mainly to the two remaining principles of shared responsibility and strengthening all parts of the system and to 'enablers' for implementing the approach. These factors have less direct impact on individual crashes but hugely influence the overall safety of the road system. These are:

- understanding crashes and risks
- innovation
- legislation and enforcement
- leadership and capability
- education and information
- admission to the system

The Panel proposes to make recommendations in all these areas because, without a coherent system-wide approach and shared responsibility, there is a risk of fragmented and ad hoc attempts to improve cycling safety, which may inadvertently lead to more deaths and serious injuries.





**Wider institutional and societal factors affecting cycling safety and participation**

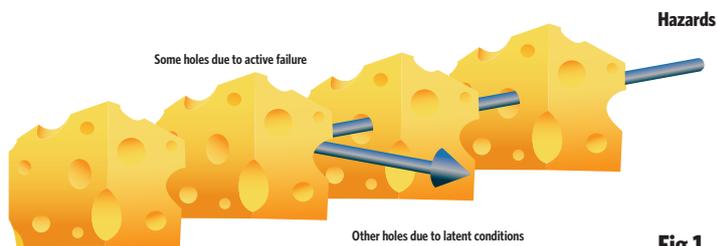
Moving beyond the boundaries of the Safe System diagram there are a range of inter-related wider institutional and societal factors affecting road safety in general, cycling safety and more broadly cycling participation.

**How do crashes happen?**

When looking at improving cycle safety, it is vital to look beyond the immediate causes of crashes and the natural desire to allocate blame. In almost every crash there will be a mix of contributing factors – for instance availability of funds for infrastructure, investment criteria, road design, the speed limit, cyclist and/or driver behaviour, financial or social pressure to hurry, applicable road rules, the weather and time of day and so on. To illustrate this James Reason’s ‘Swiss Cheese Model’ is often used:

James Reason developed the Swiss Cheese Model following his work in the nuclear industry. However, the model has now been applied in most safety critical industries including road transport.

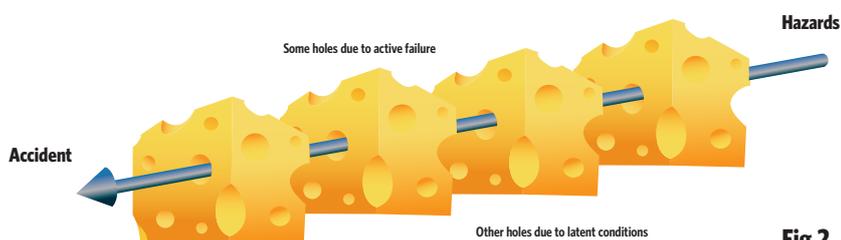
The figure below provides a visual representation of the Swiss Cheese Model. In the model, the slices of cheese represent the various system defences against adverse events and the holes represent latent and active errors or mistakes. Latent errors are factors not directly linked, but contributing to the incident (e.g. organisational level failures). Active errors are unsafe acts that can be directly linked to the incident.



Holes = hazards such as user behaviour, inappropriate speed limits, inadequate road or shoulder space etc

**Fig 1.**

Solid cheese = system defences such as user training, appropriate speed limits, signage, physical separation of users.



James Reason: 'Swiss Cheese' Model of Error

Figure provided by : <http://www.evidenceintopractice.scot.nhs.uk/patient-safety/what-is-patient-safety.aspx>.

Original model: Reason, J. (1990). Human Error, Cambridge University Press.

**Fig 2.**

An example of the application of this model in a vehicle versus cycle crash might be a situation where a driver fails to see a person on a cycle and crashes into him or her. In this situation both active and latent failures could be identified:

▪ **Active**

- Driver failed to notice a person on a cycle.

▪ **Latent**

- Driver was fatigued.
- Vehicle tyres were worn limiting grip on the road.
- Given the speed limit, road function and traffic volumes physically separated infrastructure should have been provided.
- The relevant RCA had found it difficult to obtain funding for infrastructure improvements due to restrictive investment criteria.

- Mistakes may occur many times without an obvious consequence, making them seem trivial and unimportant. However, the 'holes in the cheese' only have to align once to cause a serious crash.
- Incidents/crashes are usually caused by multiple systems failures. Therefore, a systems approach to safety improvement is essential.
- Many errors do not result in harm. However, they provide opportunities for learning and preventing harm before it occurs.
- Because incidents and crashes often occur as a result of behaviours that a road user may have engaged in many times before without harm, most road users fail to fully understand how risky some of their behaviours are. For example, drivers may routinely exceed the speed limit without fully understanding the risks and implications of doing so because crashing is such a rare event.

The key principles of the Swiss Cheese Model have a number of important implications for the Safe System approach:



# APPENDIX II: INTERNATIONAL PEER REVIEW

To ensure that the Panel's work and recommendations were consistent with international best practice and supported by available evidence, the Transport Agency commissioned Dr Cameron Munro of CDM Research, Melbourne, to carry out a peer review of the draft report published on 25 September 2014. The criteria for the review were to advise on:

- any gaps or deficiencies in the review of the evidence
- the linking of evidence to recommended actions
- the likely effectiveness and practicality of the proposed recommendations
- whether the recommendations represent accepted best practice
- the links between the recommendations and the wider policy framework, and most particularly the Safe System approach, and
- whether any further research or issues should be considered.

Here are Dr Munro's key findings from the Executive Summary (p.iii) - references are to the draft report dated 25 September 2014:

**In my view, the recommendations of the cycling panel are generally appropriate countermeasures to redress the cyclist injury burden and consistent with our best understanding of cyclist injury causation.**

The evidence on the effectiveness of the recommendations is generally patchy due to very limited evaluation that is typically conducted of the interventions (and the technical challenges of doing so). Some of the recommendations may have a much greater likelihood of being effective at reducing cyclist injuries than others; the lack of evidence though means that there is room for debate in balancing between the recommendations. Furthermore, the costs (both financial and political) of the measures will differ. The panel have implicitly recognised this by dividing actions into high and medium priority. I would suggest that the overall recommendations could likewise be prioritised. Adopting the approach of high-medium-low priority recommendations I would suggest (numbers in brackets are the corresponding recommendation in the report):

#### **High priority:**

- Manage motor vehicle speeds (6)
- Minimise conflict through infrastructure provision (4)
- Safe provision for active modes is considered at all stages of planning and investment (1)
- Establish strong leadership and accountability (2)



### Medium priority:

- Improve and expand cycling information collection (3)
- Provide safe on-road connections to cycle trails (5)
- Investigate side under-run protection for heavy vehicles (12)
- Increase support for school travel plans and cycle skills training (8)
- Develop programmes to improve road user behaviour and awareness (9)

### Low priority:

- Mandate minimum passing distances (7)
- Encourage corporate responsibility (10)
- Refresh the legislative review of regulatory provisions (11)
- Adopt improved standards for bicycle lights and e-bikes (13)

### Panel response

The Panel welcomes Dr Munro's overall endorsement of its work and recommendations, and appreciates his detailed and constructive feedback - most of which has been taken on board in finalising the report and recommendations. In relation to the division of recommendations into high, medium and low priority, the list of high level recommendations does not indicate their priority order. The Panel has developed them as an integrated package, requiring a whole-of-system approach to improving cycling safety. Within the draft 16 high level recommendations, some were divided into high and medium priority actions. However, to recognise the importance and effectiveness of speed management in reducing risk for cyclists, the Safe Speeds recommendation has been given greater prominence by placing it immediately after the 'Safe System enablers' recommendations. The Panel does not consider any of its recommendations to be of low priority.



## Other reviewer comments and suggestions with the Panel's response

Reviewer comment	Panel's response
<p>Trials of innovative infrastructure and non-infrastructure countermeasures</p> <p>Signalised and unsignalised intersection treatments</p>	<p>Recommendation 6 now includes trials of innovative treatments for intersections. Recommendation 9 covers development of national guidelines for cycling infrastructure.</p>
<p>Strict liability</p>	<p>This issue was raised by several submitters and in Panel discussions. Changing the burden of proof for selected offences would raise complex criminal law issues beyond the scope of the Panel's work. It is also unclear how such a change would contribute to reducing deaths and serious injuries in the New Zealand context.</p>
<p>Rural road shoulders</p>	<p>Improved rural space management, including shoulder widening and smooth surfacing is covered as a high priority action under Recommendation 9.</p>
<p>Engineering guidance</p>	<p>Many submitters and the 17 October summit also called for up-to-date and comprehensive engineering guidelines – covered by Recommendation 9.</p>

## 2. Philosophical and ethical approach to reducing fatalities and injuries

<p>Vision should be of zero fatalities and zero serious injuries – it is not ethical to accept any level of injury.</p> <p>'Our aim should be to reduce absolute injury burden, irrespective of any change in cycling participation and the wider societal benefits that will accrue. As such, success should not be seen in terms of risk reduction but rather overall injury reduction.'</p>	<p>The Panel agrees that no level of injury or fatalities can be considered acceptable ethically. The Safe System approach is founded on this philosophy. The Panel's Vision Zero for fatalities is more ambitious than the vision set out in the Safer Journeys strategy 2010–2020, which is 'A safe road system increasingly free of death and serious injury'.</p> <p>The Panel has considered whether Vision Zero for deaths should be extended to serious injuries, but considers that until there are no cycling fatalities on a sustained basis, it is more credible to aim for progressively reducing serious injuries in the meantime.</p>
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### 3. Conflation of cycling safety with cycling promotion

'[W]hile I support the general contextual statements about the societal benefits [of cycling] these should not be conflated with the injury burden. In other words, I am morally uncomfortable with the notion that we can "justify" cyclist injuries on the basis that the overall societal health gains are far greater. Increasing numbers need to be accompanied by other measures to make the system safer.'

The Panel shares the view that 'trading off' an increase in cycling deaths or injuries for greater societal gains is not acceptable. The Panel's remit is to recommend measures to improve cycling safety. Such measures may well increase participation in cycling, which may ultimately contribute to greater safety – both through continuing improvements in infrastructure and because motorists become more aware of cyclists and will result in societal health benefits.

Please see the box on p15 for further comment on 'safety in numbers'.

### 4. Reporting injury risk rates or absolute numbers

'[A] fatality or serious injury to a road user is a tragedy irrespective how much of that activity is undertaken. At a strategic level it is not clear how reporting crash risks rather than frequencies guides us towards better policy making.

Secondly, it is not obvious what the most obvious rate should be for cycling (e.g. per participant, trip, distance or time) and nor is there likely to be adequate data to use as the denominator.

I would argue that risk is something of a red herring for what should be the main issue – an absolute reduction in cyclist injuries. Success should not be seen in terms of risk reduction but rather overall injury reduction.'

While agreeing with the moral principle that all cycling deaths and serious injuries should be eliminated, the Panel does not accept that monitoring and reporting of risk rates is irrelevant. All the denominators mentioned are useful in different contexts. Understanding relative risk across the network is essential to targeting investment to risk and assessing whether interventions are working. Rates are also essential for comparing performance with other countries.

The Panel's recommendations on performance monitoring and indicators include continued measurement of both risk rates and absolute numbers.



## 5. Safe Speeds

Recommendation 6 refers to the need to 'Manage motor vehicle speeds to minimise cycle crash risk and severity'. 'In my view this represents the **single most effective of all the recommendations**, at least where the recommendation entails reductions in the posted speed limit and/or physical measures which seek to reduce motorist speeds. There is an overwhelming amount of research to demonstrate the safety benefits of lower speed limits on all types of roads. The panel may wish to consider briefly documenting some of the key research and practical safety outcomes from this research in the final report to reiterate the strength of the empirical data. Further, there would be merit including a box and chart illustrating the well-known relationship between vehicle speed and pedestrian fatality risk.'

The Panel welcomes the endorsement of its recommendation for better speed management to improve cycling safety.

The Panel's work has coincided with the most recent stages of the development of the Safer Speeds Programme by the Ministry of Transport and the Transport Agency. The Panel supports this work and sees no need to duplicate it. The revised recommendation seeks assurance that decision making under the programme takes appropriate account of the needs of cyclists.

The Panel has proposed three medium priority actions for speed management:

Reduce vehicle speeds by using traffic calming, self-explaining street treatments and lower speed limits around key destinations, such as schools and shops, along key cycling network routes where separated facilities are not present and in local neighbourhood streets.

Reduce vehicle speeds in conjunction with physical separation where cycle and freight routes are unable to be separated.

Reduced and more appropriate speeds on rural roads where cyclists are most at risk.

The report now includes a chart prepared by Hamish Mackie showing the relationship between speed and pedestrian fatality risk, based on a review of the most recent research – see p27.



## 6. Minimum passing distance

'In my personal view there is unlikely to be a significant cyclist injury reduction as a result of the introduction of a minimum passing distance rule. There are, in my opinion, sufficient rules within the existing traffic legislation to allow Police to prosecute motorists who pass at an 'unsafe' distance from riders. What is more likely, and is noted in the panel report, is that a mandated minimum distance may improve community awareness of their obligations towards cyclists, provide explicit guidance as to what clearance they should give riders and encourage more proactive Police enforcement.'

The lack of research providing evidence of effectiveness is also noted. Dr Munro concludes that pursuing this recommendation should not be at the expense of other recommendations that are more likely to be effective.

The Panel has carefully considered the arguments for and against mandatory minimum passing distances. On balance it has concluded that there is merit in maintaining this recommendation, but with the qualification that the rule should be trialled as in Queensland. The final form of the recommendation responds to the level of concern about the issue expressed by the cycling community, balanced with practical, economic and safety concerns expressed by some stakeholders. The Panel has stated the proposed rule in general terms and recognises that further refinement will be needed in any ultimate regulation to cater for situations where the minimum distance may not be practicable, or other factors that need to be taken into account.

## 7. Cycle skills training

'As noted in the panel report, there is a lack of evidence to suggest that cycle training reduces cyclist injuries. This is not to suggest that such an effect is not present however. What is probable is that skills training in combination with other measures such as infrastructure provision provide a net positive safety benefit (as well as encouraging greater riding, which offers significant overall societal benefits). Training for both children and adults is probably warranted; the latter in part to instil a level of confidence that is often cited as a barrier to riding. There is evidence from Australia to suggest that in collisions with motor vehicles child cyclists are more likely to be at fault than adult cyclists, further suggesting that teaching children appropriate techniques for riding in traffic are warranted.'

It is also important that cycle skills programmes have longevity and are as widespread as possible – small scale, under-funded programmes are to be avoided.

While the Panel does not see training as a panacea, in conjunction with other measures such as comprehensive school travel plans, it is likely to have a positive safety effect.

The Panel also strongly considers that development of 'traffic sense' from an early age, provided risks are well-managed, will promote safer driving by young people when they move on to motor vehicles.



## 8. Corporate responsibility and side under-run protection

'The panel recommends three high priority actions with regard to corporate responsibility, all of which involve some level of training or encouragement. While laudable, it seems these programs already exist in some way (although the level of funding and their breadth of coverage could be improved). Furthermore, the turnover of staff in some businesses (such as couriers) is likely to be substantial, requiring a strong commitment to ongoing training. I am not aware of any evidence on the efficacy of such programs, although there is little doubt they do no harm. However, given the principles of the Safe System approach I am not convinced that an education-based approach is sufficient in its own right to substantially alleviate the risks involved between riders and heavy vehicles sharing road space.'

'The panel do not make any recommendations with regard to additional blind spot mirrors but do recommend further investigation of side under-run protection for trucks. While again the efficacy of these measures is open to debate it appears to this reviewer that these measures ought to assist in reducing the risks of side swipe collisions and often fatal consequences (which are often related to riders falling under the wheels of trucks). It appears there is sufficient international evidence to suggest side under-run protection can be beneficial to cyclist safety, and in my view this priority could be given a higher level of endorsement in the recommendations (which currently recommend only that the responsible authorities complete a business case into these options).'

The Panel has noted the current initiatives and agrees they should be strengthened. The more proactive duties imposed on business owners by changes to workplace health and safety legislation provide an opportunity for this.

Recommendation 15 includes other technologies besides side under-run protection.

The cost and efficacy of in-vehicle features still needs to be assessed in more detail in New Zealand conditions, so the Panel has recommended further investigation rather than immediate introduction.



## 9. Bicycle lights and e-bikes

Support for increasing light visibility from 100m to 200m.

'However, as noted in the panel report almost all cycling lights available meet or significantly exceed this 200 m requirement. As a result, changing the road code would be unlikely to significantly change safety outcomes. Instead, there is empirical evidence to suggest that light power is in itself insufficient as a measure of lighting visibility to other road users. It is suggested that empirical measurements by local advocacy groups and perhaps general advice provided by [NZTA] to riders may assist in encouraging riders to purchase the most visible lights available (and not simply those with visibility at 200 m directly ahead).'

It is important to have a relatively straightforward standard for the Road Code and for enforcement. The Transport Agency will continue to provide practical advice on the options available.

High-visibility clothing – agreement with Panel's conclusion. Suggests including support for reflective devices attached to knees and ankles.

Refer to comments on p43

E-bikes – not currently an issue in New Zealand, but appears to be merit in bringing the New Zealand standard more in line with EU practices.

Some submitters expressed concern about adopting the EU standards without further investigation. An investigation is now recommended.

## 10. Performance indicators

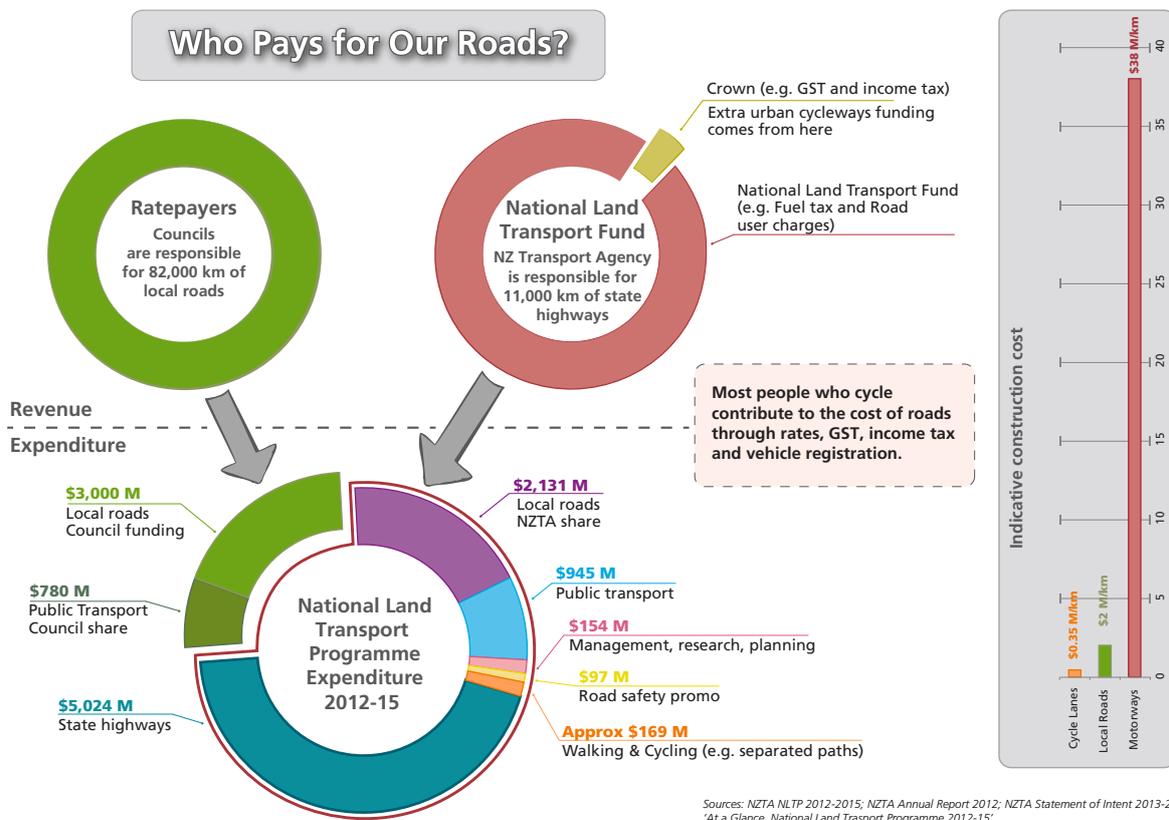
Recommends that the list be shortened so that the cost of collection and analysis is not disproportionate. Delete indicators that are not linked to recommendations. Overall injury numbers rather than rates. Participation rates are peripheral to the Panel's main focus.

Produce a table linking recommendations, action and indicators.

The proposed table will be developed by the Transport Agency as the first stage of implementation.



# APPENDIX III: ROAD USER ATTITUDES



Source: Simon Kennett, Greater Wellington Regional Council

## "Cyclists don't pay"

A frequent complaint from motorists is that cyclists do not pay petrol taxes, registration, road user charges or ACC levies. Over 80 percent of Cycling Advocates' Network members own a car and therefore do pay road taxes. Moreover, a majority of land transport revenue pays for building new roads to the standards required by motor vehicles. Land transport revenue also pays for road maintenance to repair damage to roads caused by heavier vehicles. Bicycles do not damage roads due to their low weights, so the cost of having a cyclist on the road is comparably low (Cycling Christchurch 2013 and Greater Wellington Regional Council 2014).

Anyone who owns or rents a home contributes to local council rates, which pay for a percentage of local roads. People who work are paying income tax and ACC levies; and anyone who consumes goods and services is paying GST.

## "Cyclists are a law unto themselves"

Under the Land Transport Act 1998, 'driver' includes a person riding a bicycle. Therefore, people who cycle must obey all the road rules applying to drivers of motor vehicles and vehicles. It is difficult to quantify the extent to which cyclists are involved in traffic offences because of the practical difficulties involved in bringing prosecutions. Anecdotally, letters to the editor and media reports indicate that many motorists find cyclists' misbehaviour frustrating and annoying. In turn, most cyclists can relate incidents and near misses involving motorists driving with inattention or flagrant disregard of cyclists' safety. A 'them and us' culture has developed. In the Panel's view the progressive improvement of cycling infrastructure will help reduce tensions by eliminating many conflict points. At the same time there is scope for investment in a social marketing campaign to improve mutual understanding between cyclists and motorists - covering issues such as courtesy and patience, as well as understanding of the road rules.



# APPENDIX IV: CYCLE SKILLS TRAINING

There are three levels of training in the Transport Agency approved programme.

Grade 1 cycle skills training is targeted to 8+ years old (year 4,) takes three hours and is held in a non-traffic environment (e.g. playground, netball court). The trainee to instructor ratio is 30:1 (theory) and 15:1 (practical).

Grade 2 training takes seven to eight hours in total (30 minutes theory and six hours riding on local roads). The trainee to instructor ratio is 30:1 (theory) and 6:1 (practical). Target group is 10+ years old (year 6)

Grade 3 training takes two to eight hours and takes place in more challenging traffic environments. It is aimed at 12+ year olds (year 8) and requires a trainee to instructor ratio of 3:1.



# APPENDIX V: THE HUMAN IMPACT OF CYCLING DEATHS

On Monday 30 September 2014, Ming Chih Hsieh, a 33 year old Taiwanese man on a working holiday in New Zealand was killed in a collision with a truck in Christchurch. He was an electrical engineer and accomplished triathlete. John Thom and Julie Wagner, his hosts in Okains Bay, wrote to the Akaroa Mail about their feelings at his death. They hope that his death may focus efforts on improving cyclists' safety. Their letter is reproduced here with their permission and that of Ming's family in Taiwan, who have also pleaded for improved safety: [www.radionz.co.nz/news/regional/256167/cyclist's-father-pleads-for-safety-boost](http://www.radionz.co.nz/news/regional/256167/cyclist's-father-pleads-for-safety-boost)

The death was referred to the Coroner.

## A very sad loss indeed

Sir,

Over many years we have hosted a hundred or more people from all over the world as helpers under the Wwoof and HelpX schemes. They have all been nice people and good helpers.

Many have been memorable.

Most have been young, all a long way from home and although it is a simple work for board exchange it's easy to become involved in their big adventure and sometimes feel a bit parental.

Many have become long term friends, some have proposed here, some married and some stayed to make a life in NZ.

One rolled our ute and wrote it off but both him and his passengers walked clear.

Recently we joined Warmshowers.org, another worldwide scheme, offering a bed, a meal and whatever other hospitality members can offer to travelling cyclists.

The payoff is receiving the same welcome from other members when you travel.

Our last guest was Ming Chih Hsieh, a young Taiwanese two years into a world cycling tour.

We were anxious when he was late arriving and drove to meet him, finding him close to home at twilight having pedalled from Christchurch, including the climb over the

hilltop from Little River.

We could hardly lift his heavy bike and attached luggage into our truck.

He was very fond of New Zealand as many of our young visitors are.

While he was with us the weather turned foul and a planned short stay turned into four days.

He was pleased to accept a ride to the hilltop on his way back to Christchurch and we farewelled him with a wish for happy travels and a huge rice ball wrapped in cellophane to fuel him on his way.

Within days we were shocked to learn that his life had ended under a truck in Christchurch.

His family arrived in New Zealand to take him home and we were able to contact them.

By happy coincidence they were in Akaroa retracing some of Ming's moves.

We met them by the foreshore in a raging southerly and brought them home for a cup of tea, a grieving family in a strange country living out a parent's worst fear.

Through an interpreter we were able to fill in some details of Ming's time with us and even shared a few laughs about his prodigious cyclist's appetite.

They were very grateful for the small consolation we could offer and left with a little weight off their shoulders.

We told them that we admired their forgiveness and lack of blame for the

accident that took Ming's life.

Also that we shared their hope that his death may focus efforts on improving cyclist's safety in this country.

We promised to keep in contact with them and try to help make something positive come out of this sad event.

John Thom  
and Julie Wagner

# APPENDIX VI: THE BENEFITS OF INVESTING IN CYCLING

## Investing in cycling; in numbers

Danish levels of cycling in the UK would **save the NHS**

**£17 billion** within 20 years



... and **increase mobility** of the nation's **poorest families by 25%**

Cycling saves a **third of road space** compared to driving, to help **cut congestion**



**More cycling** and other sustainable transport could **reduce road deaths by 30%**



**Bike lanes** can **increase retail sales by a quarter**



**Bike parking** takes up **8 times less space** than cars, helping to free up space



Shifting just **10%** of journeys from car to bike would reduce **air pollution** and save **400 productive life years**



Adopting **Dutch safety standards** could reduce **cycling casualties by two thirds**



This report was commissioned by British Cycling and made possible through support from law firm, Leigh Day

Source: Aldred (2014)

# APPENDIX VII: SUMMARY OF SUBMISSIONS

## FEEDBACK FROM CONSULTATION

This appendix lists the organisations and individuals who have made submissions. The Panel is very grateful to everyone who has taken the time and trouble to put forward their views and provide information. The complete transcript of submissions runs into several hundred pages and it is obviously impossible to do justice to all of them within the limitations of this report.

The main themes in the submissions were, in no particular order:

- Need for greater clarity and forcefulness in the recommendations
  - Overwhelming support for giving cycling greater priority in the GPS and other key planning and investment documents
  - Call for more money to be invested in both cycling safety and increasing cycling participation, and for the \$100 million Crown funding to be renewed for future planning periods
  - Increase in the funding assistance rate for cycling projects
  - Significant support for mandating minimum passing distances and side under-run protection on trucks
  - Concern that minimum passing distances would not be workable given the many narrow roads in New Zealand
  - The Transport Agency needs to work more in partnership with local government
  - Comprehensive and up-to-date guidelines developed for cycling infrastructure, including intersection treatments
  - Innovation encouraged and trials carried out to build support in communities
  - A wish to see a detailed action plan with clear accountabilities and timelines
  - A national cycling strategy is needed
  - Both cyclist and motor vehicle drivers need to show greater care and consideration for each other – the equivalent of ‘Ghost Chips’ for cycling is needed
  - Cycling advocacy groups and the Automobile Association supported progressive removal of parking from arterial routes, consistent with the One Network Road Classification programme. However, Councils are concerned about the practicality and local politics involved.
  - Concern about planning processes and the amount of consultation required – sometimes the cost of consultation was greater than the value of the work for small infrastructure projects
  - Overseas cycling tourists commented on how dangerous cycling here feels compared with Europe and the USA
  - More emphasis needs to be given to understanding cyclist-only crashes and developing solutions to address these
  - Changing the ‘medium’ priority given to walking and cycling in Safer Journeys to ‘high’
- A few submitters called for repeal of the compulsory helmet wearing law because of its perceived negative impact on cycling participation. Other submitters promoted particular items of equipment or road treatments. Alcohol Healthwatch provided a very useful submission on cycling while alcohol impaired, and the Panel agrees that further investigation into this issue is needed.
- The Panel sees the level of positive and constructive feedback as an endorsement of its proposals. We have revised the report to clarify the recommendations and the reasoning and evidence behind them.



The following comments explain our approach to issues where the Panel might not have gone as far as some submitters would have liked.

### **Funding increases**

It will be a challenge for both the Transport Agency and local government to fully utilise all the available funding from the National Land Transport Programme and the Crown through to 30 June 2018. Sector capacity to deliver best practice infrastructure and other interventions will take time to develop. Interested parties will have the opportunity during the development of the GPS 2018–2021 to assess the progress that has been made, what is proposed and whether it is adequate.

### **Funding assistance rate (FAR)**

The Transport Agency has just completed a major review of the FAR. Proposing another review would not be useful.

### **National Cycling Strategy**

This is outside the Panel's terms of reference.

### **Cycling Action Plan**

Our terms of reference and resources did not extend to developing an action plan. The Transport Agency's new National Cycling Team is developing a work programme to support implementation of the recommendations accepted in whole or in part by the government. It will also work closely with local government and provide input to the development of the next Safer Journeys Action Plan 2016–2020.

### **Safer Journeys priority**

The Safer Journeys priorities were determined objectively from death and serious injury rates by mode or cause. The medium priority reflects the fact some other issues have a higher impact on overall death or serious injuries than cycling. These include alcohol, speed and motorcycling. The medium priority has been an issue in some cycling projects failing to get funding approval. The Transport Agency is developing its Investment Assessment Framework for 2015–2018. We understand that cycling could be given a higher priority for strategic fit on the basis of the final version of the GPS and the priority signalled by the Crown funding injection.

Recalibrating one Safer Journeys priority in isolation from the others is difficult to justify, without a fuller investigation, which is outside the Panel's remit.

### **Other issues raised**

The following issues were raised by relatively few people or organisations; the Panel's responses are noted for completeness.

### **Allow cyclists to ride facing on-coming traffic**

Although the Road Code recommends that where there is no footpath pedestrians should walk so as to face on-coming traffic, the Panel does not agree that riding on the right would work for cycling. Crashes resulting from cycling in the opposite direction at driveways and intersections would increase by more than the crashes that such a measure tries to avoid.



## Bunch riding

Bunch riding is a source of aggravation for some motorists. A few submitters wished to see it abolished. The Panel does not agree that this is necessary, but accepts there is a need to raise awareness of the guidance already available in the Road Code for Cyclists [www.nzta.govt.nz/resources/roadcode/cyclist-code/about-cycling/cyclist-responsibilities.html#groups](http://www.nzta.govt.nz/resources/roadcode/cyclist-code/about-cycling/cyclist-responsibilities.html#groups) and on many cycling group websites. For instance, in response to crashes on Tamaki Drive, Cycle Action Auckland led the development of the Good Bunch, a voluntary protocol for bunch riding: see <http://caa.org.nz/general-news/the-good-bunch-changing-minds-on-tamaki-drive/>



## Strict liability

Please refer to the comments on the peer review for the Panel's views on this issue (p57).

## Road Transport Forum

The Road Transport Forum is the national body representing about 80% of all road transport operators providing commercial freight services. Its main concerns can be summarised as:

- The document lacks balance and the recommendations relating to heavy freight transport are extremely biased and inappropriate.

- The draft report reflects the Panel's composition with no input from a Heavy Motor Vehicle perspective and an extremely cycling centred focus.
- Cyclists need guidance on measures that can be taken to improve their safety. The document is permeated with cyclist self-entitled doctrine and fails to recognise or promote a shared responsibility for improving safety.
- The freight industry takes extreme issue with the anti-trucking sentiment that is woven throughout the document. Our concern is not that the road freight industry is targeted but rather that the Panel has been distracted from their real task.
- Crash statistics show that any person embarking on a cycling journey has three times more risk of being involved in a fatal accident with a car than with a truck; is 11 times more likely to suffer serious injury as a result of colliding with a light vehicle, and 18 times more likely to suffer minor injuries. That is the reality that cyclists must be made aware of.
- Demonising trucks does nothing to increase cycling safety.
- The international comparisons used are invalid. Configurations and dimensions of heavy vehicles in NZ are significantly different to overseas jurisdictions. The New Zealand cyclist profile is probably different also.
- The sensible proposition is to encourage all road users to act more responsibly towards each other's road sharing and safety needs before looking to impose heavy handed regulations

## Cycling Safety Panel's response

The Panel acknowledges that it has a pro-cycling focus but this is consistent with its terms of reference. It is not "anti-truck", but has highlighted the part that the freight industry can and should play in improving cycling safety. Other commentary and recommendations address the responsibilities that cyclists have as road users.



The text relating to the disproportionate representation of trucks in cycling fatalities has been amended to clarify that most fatalities involve cars, but we note that the involvement of trucks in cycling fatalities is still disproportionate compared to the proportion of trucks in the total vehicle fleet or the proportion of total vehicle kilometres travelled by trucks.

The law is clear that trucks (and other vehicles) driven for reward are workplaces. The people or businesses in charge of large and potentially dangerous machines have a duty to make them as safe as possible. In a factory, failure to fit protective equipment would not be acceptable. We question why it is acceptable for most trucks to have such extensive blind spots or lack equipment to prevent people from being swept under the wheels? While educating cyclists about the current dangers is important, it is not the complete or long term answer.

Under the Safe System shared responsibility is essential. The Panel welcomes the Transport Agency's recent establishment of a Road User Workshop Working Group involving representatives from the freight, taxi and coach industries as well as local government and cycling advocacy groups to collaborate on cycling safety issues.

## Cycling Safety Panel – list of organisations making submissions

### Local government

Auckland Council

Auckland Transport

Wellington Regional Transport Committee

Tasman District Council

Kapiti Coast District Council

Nelson City Council

Tauranga City Council

Palmerston North City Council

Marlborough District Council

### Health related

SafeKids

Hawkes Bay District Health Board

Alcohol Healthwatch

Bay of Plenty DHB Public Health Service

Mid Central Health

Auckland Regional Public Health Service

### Cycling advocacy groups

Bike On New Zealand Charitable Trust

Cycle Aware Manawatu

Cycling Advisory Group Gisborne

Hutt Cycle Network

Cycle Aware Wellington

Cycle Action Auckland

Cycle Action Waikato

North Taranaki Cycle Advocates

Spokes Dunedin

Spokes Canterbury

Cycling Advocates' Network

Bicycle Nelson Bays

Nelson Tasman Cycles Trails Trust

Gisborne Cycling Tours

Frocks on Bikes

Heart of Biking Nelson-Tasman

### Central government agencies

Ministry of Education

### Other stakeholders

Local Government New Zealand

Automobile Association

Road Transport Forum

Green Party of Aotearoa

BRAKE (Road Safety charity)

School Speeds

Generation Zero

### Professional organisations and service providers

IPENZ – Institution of Professional Engineers New Zealand

SASTA – Safe and Sustainable Transport Association

Architectural Centre

MWH NZ

### Commercial providers

Via Cycles

West Coast Shuttle

Fusion Processing

### Regional Sports Trust

Harbour Sport



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## Individual submissions

Richard Ashurst	David Garland	Amy Mitrovic
Dr Mark Austin	Colin Gauld	Julia Moss
Babbage Family	David & Leigh Goodman	Mark Ngatuere
Martin Ball	Travis Gray	Greg Nikoloff
Chris Ballantyne	Carol Green	Michael Norton
Rudy Baptist	Marion Groth	Matthew Naery
Terry Baucher	Ken Guest	Liam O'Leary
Robin Benson	Tim Gummer	Monique Olivier
Heather Blair	Dr Marc Gutenstein	Lyneke Onderwater
Roger Boulter	Quinn Hamill	Bryce Pearce
Mark Bracey	Aaron Hall	Christopher Pearce
Adam Brasell	Stuart Harwood	Ari Pfeiffenberger
Allan Bridge	Mike Haworth	Teresa Porter
Terry Brown	Ryan Hepburn	Carmen Potter
Martin Burwood	Tim Holvey	Robbie Price
Rex Bushell	Celia & Tim Hope	Tony Reynolds
David Catling	Chris House	Max Robitzsch
Rob Champion	Richard Hovey	David Robinson
Jacques Charroy	Josie Howitt	Dr Edgar Rodriguez-Ramirez
Beatrice Cheer	Lou Hoyte	Richie Russell
Ian Chesterman	Robert Hynson	Megan Salole
Nat Christensen	Ross Inglis	Kolja Schaller
Claire	Anna-May Isbey	Hanno Schoonraad
Barry Coates	David Jackson	Bruce Scott





Tamlin Conner	Jack J Jiang	Dara Walsh Severn
Simon Cross	Fenja Jones	John Sharp
R A Culver	Evan Keating	Dylan Smith
Tom Davies	Dan Kelly	Dave Slomp
Rob Davidson	Paul Kelway	Gayle Somerville
Greg Dawes	Arla Kerr	Linda Sorensen
Dani de Thierry	David Kraitzick	Ben Stantiall
Holly Dixon	Samara Kruskpof	Ina Stenzel
Janet Dixon	Rebecca Lamb	Isabelle Stewart
David Do	Richard Latty	Templeton Family
Damian Dobbs	Nick Leach	Natalie Thomson
Joe Ede	Brenda Leeuwenberg	David Tong
Rosamund Edwards	Ian Lightbody	David & Helen Tripp
Logan Elliott	Zara Lynch	Inge Verstraaten
Scott Espie	Claire Macky	Kathy Voyles
Eveleens-Van Staveren Family	Stewart McKenzie	Leomie Wade
Alan Eyes	Ben Male	Dara Walsh Severn
Ilka Fedor	Chris McArthur	Brook Warner
Robert Fleming	Hayden McFarland	Karen Watson
Hilary Fowler	Kirsty McKenzie	Rachael Williams
Martin Fraser	Tadeas Mejdr	Christopher Wilson
Scott Gamble		Hans Wiskerke



# APPENDIX VIII: MEASURING LOCAL SUCCESS

Local authorities wanting to achieve cycling success may assess their performance, measure their progress and look to the most successful locations for inspiration. Benchmarking is a systematic process that facilitates self-assessment, identifies who is succeeding, what really works, and how to move from where they are to where they want to be. “Yardstick” is a benchmarking process that has successfully supported delivery of local authority parks, recreation and leisure services since 2001<sup>1</sup>.

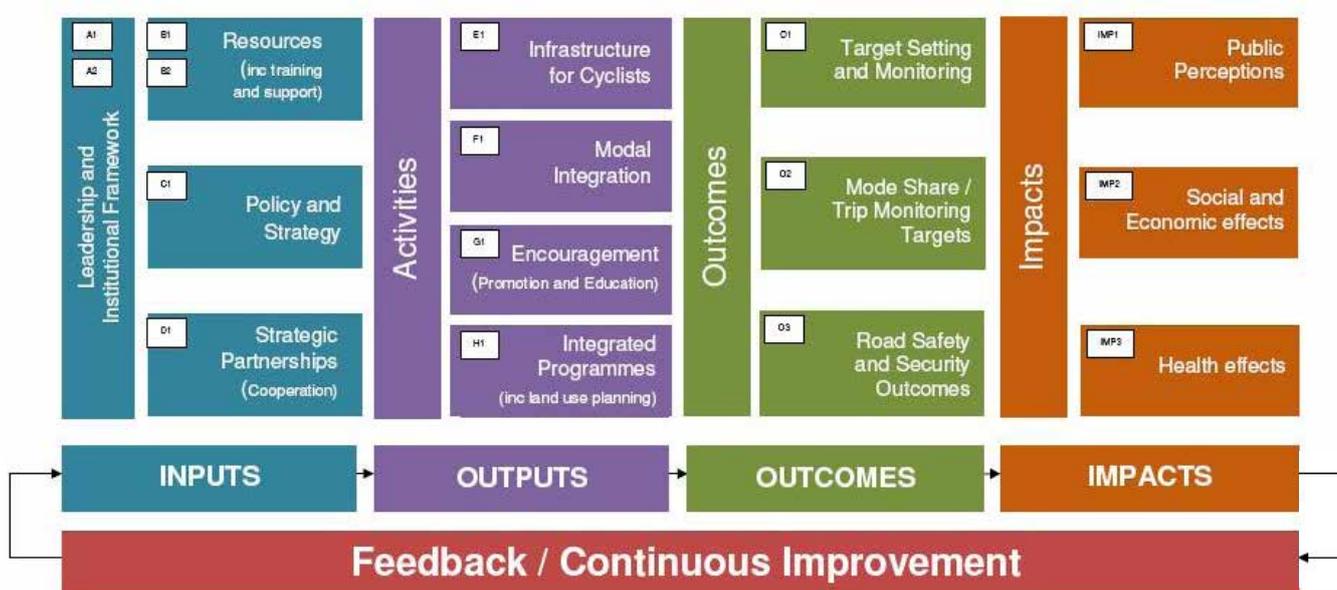
Participation was envisaged at three levels;

- 1) Self-assessment against quality descriptors.
- 2) Completion of a questionnaire.
- 3) Mutual peer reviews with similar authorities and expert audits.

Benchmarking examples support provision for cycling in Britain, Continental Europe and the USA. In 2010 the Transport Agency reviewed these examples and in collaboration with local government, developed a framework that was refined and shared in workshops with local government and stakeholders throughout New Zealand (Cheesbrough and Hughes 2010).

Although it was well supported, no further work was undertaken on the tool at that time. Recent government announcements to invest heavily in cycling give cause to refresh the benchmarking framework and support its implementation by local authorities.

The structure was based on the proven European Quality Framework and covers all key aspects from leadership, policies and resources, activities delivered, immediate outcomes and ultimate impacts, as illustrated below.



<sup>1</sup> [www.yardstickglobal.org](http://www.yardstickglobal.org)

# GLOSSARY

**ACC** – Accident Compensation Corporation

**CAS** – Crash Analysis System

Managed by the Transport Agency, CAS is a map-based tool used to record all traffic crashes in New Zealand reported by the Police; it holds data from 1980 to the present. For each crash the following information is provided: crash location, injuries, vehicle movements, contributing factors. Data outputs include crash plots and maps, crash listings, site summaries, tables and collision diagrams, roading information. For more information see: [www.nzta.govt.nz/resources/crash-analysis-reports/briefing-notes.html](http://www.nzta.govt.nz/resources/crash-analysis-reports/briefing-notes.html)

## Defining and managing risk

Collective risk measures the crash density along a road. That is, the number of crashes per kilometre. Each individual vehicle may have a low personal risk of crashing, but a large number of vehicles add up to a high collective risk. Roads with high traffic volumes are likely to have more crashes unless they have specific safety treatments. The greatest safety gains can be made through infrastructure improvements to roads of high collective risk and high traffic volume; and where enforcement may be more effective. These roads are also likely to be economically important and so safety treatments have a higher economic benefit.

Personal risk measures the risk of a crash per 100,000 kilometres travelled on a particular stretch of road. A road with low volumes of vehicles can have high personal risk but high-cost infrastructure changes are unlikely to be cost effective. In this case other lower-cost Safe System interventions will be needed.

Both measures are used in KiwiRAP – see below.

## Key strategic documents

The Transport Agency's **Economic Evaluation Manual** (EEM) is the industry's standard for the economic evaluation of transport activities. The EEM is used by approved organisations for economic evaluation and the preparation of funding applications to the Transport Agency.

The **Government Policy Statement** on Land Transport Funding (GPS) is the Government's main lever for setting priorities and funding levels for land transport investment.

The draft GPS 2015 includes:

- national objectives for land transport
- the results the Crown wishes to achieve from the allocation of funding from the National Land Transport Fund
- the Crown's land transport investment strategy
- the Crown's policy on borrowing for the purpose of managing the National Land Transport Programme.

The GPS cannot determine which projects will be funded, or how much funding any particular project will receive. Rather, the GPS sets ranges of funding that government will make available for different types of activity. The Transport Agency then determines which projects receive funding – and to what level – within those overall funding ranges.

The **Transport Agency's Statement of Intent (Sol)** sets out an approach and course of action for the next three years that will contribute to the delivery of the government's land transport objectives and wider transport vision. It includes performance measures and what is intended to be measured (and how) and details of what is expected to be accomplished. The document also includes full financial statements. The Sol is a statutory compliance document.

**KPI** – key performance indicator

**KiwiRAP** is the award-winning New Zealand Road Assessment Programme (RAP), developed in partnership by the Automobile Association, Ministry of Transport, NZ Police, ACC and the NZ Transport Agency.

There are three protocols: risk mapping, star rating and performance monitoring.



Risk mapping uses historical traffic and crash data to produce colour coded maps that illustrate the relative levels of collective and personal risk on sections of the road network.

Performance tracking involves a comparison of crash rates over time to establish whether fewer, or more, people are being killed or injured, and to determine if measures to improve safety have been effective.

Star ratings are based upon the engineering features of a road. Between one and five stars are awarded to road links depending on the level of safety 'built in' to the road.

An excellent correlation between injury crash rates and star ratings demonstrates the strong technical basis underlying KiwiRAP and provides confidence that improvements to the star rating of a road will deliver the expected crash reductions.

For more information see: <http://www.kiwirap.org.nz/>

### **One Network Road Classification (ONRC)**

The ONRC's purpose of is to:

- recognise the role and function of each type of road in the road network
- provide a basis for establishing consistent levels of service for each category of road (including levels of service for safety)
- use this information to guide decisions about the design and management of the road, including safe operating speeds to ensure it can fulfil its role in the transport network.

For more information see: [www.nzta.govt.nz/projects/road-efficiency-group/onrc.html](http://www.nzta.govt.nz/projects/road-efficiency-group/onrc.html)

**OSH** - occupational health and safety

**RCAs** - road controlling authorities (e.g. Auckland Transport)

**SUPS** - side under-run protection systems



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