KiwiRAP

NEW ZEALAND ROAD ASSESSMENT PROGRAMME

2008

HOW SAFE ARE OUR ROADS?

Rating New Zealand's State Highways for Risk

The New Zealand Road Assessment Programme (KiwiRAP) has been initiated in New Zealand as a partnership between government transport agencies and the New Zealand Automobile Association.

These organisations have an interest in road safety and in achieving the aims of the government's Road Safety to 2010 strategy. This strategy aims to reduce road casualties to no more than 300 deaths and 2,200 hospitalisations (hospitalisations greater than one day) a year by 2010. In 2006, 393 people died on New Zealand roads. There were many more – around 3,000 – seriously injured.

The following organisations are partners in KiwiRAP:

> **NEW ZEALAND AUTOMOBILE ASSOCIATION (NZAA)**
The New Zealand Automobile Association represents over 1.2 million Members and has a strong interest in road safety. Overseas automobile clubs have been heavily involved in the development of road assessment programmes globally and the NZAA has been able to link into that network to make the expertise available to New Zealand.

> **MINISTRY OF TRANSPORT**
As the government's principal transport policy adviser, the Ministry both leads and generates policy. The government's New Zealand Transport Strategy (NZTS) provides the framework within which transport policy is developed. The Ministry is responsible for developing and coordinating implementation of the government's Road Safety to 2010 strategy.

> **TRANSIT NEW ZEALAND**
Transit New Zealand is the Crown entity responsible for the state highway network - the strategic roads and motorways that make up about 12% (10,894 km) of all New Zealand's roads, and account for about half of the 36 billion vehicle kilometres we travel every year.

> **LAND TRANSPORT NEW ZEALAND**
Land Transport New Zealand is a Crown entity formed to promote land transport sustainability and safety, and allocate government funding for land transport.

> **ACCIDENT COMPENSATION CORPORATION**
The Accident Compensation Corporation (ACC) administers New Zealand's accident compensation scheme, which provides personal injury cover for all New Zealand citizens, residents and temporary visitors to New Zealand. The ACC has an interest in injury prevention and therefore road safety.

> **NEW ZEALAND POLICE**
New Zealand Police is responsible for the enforcement of the majority of road safety rules and regulations.

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Introduction

What is KiwiRAP?

KiwiRAP is part of an international family of Road Assessment Programmes (RAP) under the umbrella of the International Road Assessment Programme, iRAP. Similar programmes have been implemented in Europe (EuroRAP), Australia (AusRAP) and the United States of America (usRAP) and developments are underway for a programme in Africa.

The objectives of KiwiRAP are:

- to reduce deaths and injuries on New Zealand's roads by systematically assessing risk and identifying safety shortcomings that can be addressed with practical road improvement measures
- to have risk assessment as a key factor in strategic decisions on road improvements, crash protection and standards of road management
- to provide meaningful information on where the greatest levels of risk are faced, and in turn to influence behaviour.

How does a Road Assessment Programme work?

Road Assessment Programmes internationally consist of three 'protocols'.

1. **Risk Mapping** – uses historical traffic and crash data to produce colour-coded maps which illustrate the relative level of risk on sections of the road network.
2. **Performance Tracking** – involves a comparison of crash rates over time to establish whether fewer – or more - people are being killed or injured and determine if countermeasures have been effective.
3. **Star Rating** – road inspections look at the engineering features of a road (such as lane and shoulder width or presence of safety barriers). Between 1 and 5 stars are awarded to road links depending on the level of safety which is 'built-in' to the road.

This report

This report publishes the results of the first KiwiRAP protocol – Risk Mapping.

The Risk Maps in this document are based on traffic and crash data for the five-year period between 2002-2006 and focus on the state highway network. There could be potential in the future to extend the analysis to tourist routes or key regional non-state highway routes. The state highway network makes up about 12% of New Zealand's roads, but accounts for about half of the 36 billion vehicle kilometres travelled every year. Approximately 32% of all fatal and serious injury crashes in 2006 occurred on open road sections of the state highway network.

The Risk Maps use actual crash data to highlight how the risk of having a fatal or serious injury crash varies across the state highway network. Each crash represents a failure in one element, or a combination of elements, of the 'safe system' – the vehicle, the driver or the road itself.

The Risk Maps include results for a total of 172 links and 10,856 kilometres of the state highway network. The links range in length from 2.4 to 318 kilometres with an average length of 63 kilometres.

The national summary of statistics for the state highway network is shown in the table below. The table shows what percentages and how many kilometres of the state highway network fall within the five risk categories.

	High	Medium-High	Medium	Low-Medium	Low
COLLECTIVE RISK (Average annual fatal and serious injury crashes per km)	8% 811 km	14% 1560 km	22% 2344 km	27% 2967 km	29% 3174 km
PERSONAL RISK (Average annual fatal and serious injury crashes per 100 million vehicle-km)	21% 2258 km	25% 2703 km	28% 3030 km	15% 1637 km	11% 1228 km

* Percentages may not add to 100% due to rounding

The New Zealand Police use crash data mapping to identify risk areas as part of their planning for road safety activity. A different methodology which is focused on smaller sections of highways is used.

Future work under development

Work is currently underway on a Star Ratings trial. The third protocol, Star Ratings looks into the contribution that the road itself makes towards road safety. This information will be valuable in educating the public about what makes one road safer than another, and enable them to identify what road or roadside features change their level of risk, so they can adapt their driving accordingly.

Consideration will be given to the second protocol, Performance Tracking once crash data is available for the future periods.

How can KiwiRAP help save lives?

In 2006, 393 people died on New Zealand roads. There were many more – around 3,000 – seriously injured. Preventing, or at least reducing, this road trauma requires vehicle manufacturers, road authorities and drivers to share responsibility for road safety.

The safe road system

Road safety can be considered from a systems point of view, with three elements contributing to road safety – the driver, the vehicle and the road itself.

To effectively increase road safety means improvements in all three elements of the system; that is, safer drivers in safer vehicles on safer roads. Reasonably objective and accepted measures are currently available to help define what constitutes a safe driver and a safe vehicle. A safe driver is one who is licensed and obeys the law and acts responsibly, with regard for the safety of themselves and others. A safe vehicle is one that rates well under the Australasian New Car Assessment Programme (ANCAP), which crash-tests cars and assigns a star rating out of five - the more stars the safer the vehicle.

KiwiRAP provides a systematic and internationally recognised way of measuring what constitutes a safe road. By giving New Zealand's roads a safety rating, KiwiRAP will be able to communicate the risk of death and injury more meaningfully. It will help drivers understand how risk can vary according to changes in the road environment. A risk-aware driver will be more likely to adapt their driving to reduce their risk of being involved in a crash.

Risk ratings will provide road planners and engineers with vital benchmarking information to show how well, or how poorly, a particular road performs in comparison to other roads.

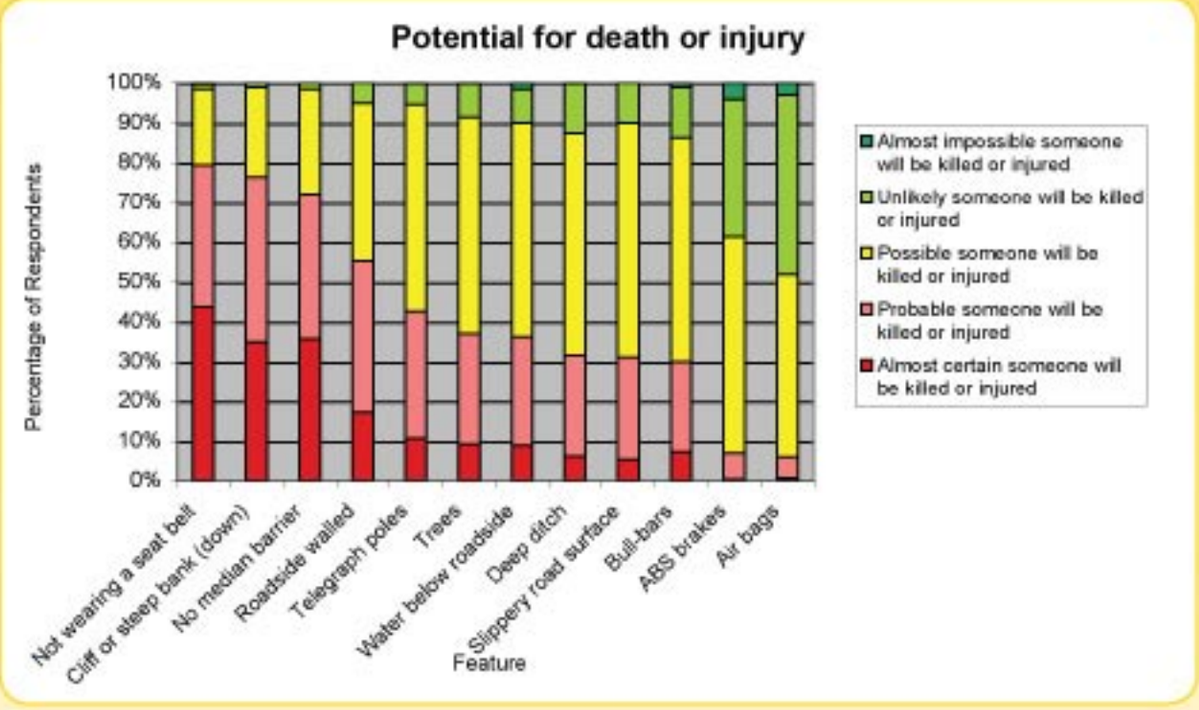
The Government's Road Safety to 2010 strategy proposed various interventions to develop safer drivers, safer vehicles and safer roads. The strategy forecasted that 42 lives a year could be saved through improvements in road engineering. The remainder can be saved through improvements in driver behaviour, vehicles, and current initiatives (efficiency). According to the Government's Road Safety to 2010 strategy, the lives that can be saved by each of these initiatives is shown in the picture below.

What do drivers think about road engineering?

As part of its July 2007 membership opinion survey, the New Zealand Automobile Association included a series of questions to measure how motorists assessed different hazards or road safety features.

The respondents were given photos of different roads and asked to mark on a scale how safe or how dangerous they thought the roads were. The respondents were able to identify that a road with a median barrier was safer, and that a road with a cliff or steep bank was more dangerous. However, respondents did not identify roads with roadside hazards, such as ditches or poles, as dangerous.

This lack of knowledge was confirmed when respondents were asked to imagine a situation where they were driving and lost control of a medium sized car on the open road at 70km/h. They were asked to identify the likelihood of someone in their vehicle being killed or injured due to the existence (or absence) of a number of features. The survey results are illustrated in the graph below.



The benefits of wearing a seat belt are obviously well known, with almost 80% of respondents marking it either probable or almost certain that someone would be killed or injured by not wearing a seatbelt. The dangers of a cliff or a steep bank were also identified, with 75% of respondents thinking that a cliff or steep bank would mean it was probable or almost certain that someone would be killed or injured.

In contrast, roadside hazards such as deep ditches and trees were recognised by few. In fact, around 12% of respondents thought it would be almost impossible or unlikely someone would be killed or injured by a deep ditch.

Crash statistics show that 50% of rural and 28% of urban accidents in New Zealand involve a roadside hazard and the majority of these are 'single vehicle loss of control' crashes. Major hazard types are upright cliff banks, ditches, trees and poles, with water bodies and trees contributing to particularly severe crash outcomes.

How can engineering make our roads safer?

Road crashes are almost always multi-factor events involving the driver, vehicle and/or the environment, including the road. There are many elements of the road that contribute to safety outcomes including its width, alignment, the presence and type of intersections, and roadside hazards such as trees, poles and drains.

It is recognised that whatever we do to make drivers more alert, law abiding and competent, some will still make mistakes, but should not have to suffer unnecessarily harsh crash outcomes (i.e. serious injury or death). We must work on designing and operating a road network that is more forgiving.

We can reduce both the number of crashes that happen and the severity of those that do occur, by re-designing roads to make them safer. However, risk cannot be eliminated through infrastructure improvements alone, there must be improvements to the driver, the vehicle and the road. The driver must always share responsibility for a safe road system. Engineering measures can influence the messages we receive by making a road more 'self explaining'. The messages we receive and the way we react can have a significant influence on crash occurrence and outcomes. Examples of specific treatments, their potential effect on the four main crash types, and their relative costs are given in the table on the next page.

Potential Reductions (%) in Various Injury Crash Types

Treatment		Lost Control (Bends and Straights)	Head-on	Collisions with Roadside Objects	Intersection Collisions	Relative Cost to Implement
Road signs – e.g. curve coming up, suggested speeds		15-35	15-35	15-35	15-35	$
Road marking (painted lines and white pickets)		10-40	10-40	10-40		$
Reduce speeds (per 10km/h reduction in speed)		15-30	15-30	15-30	15-30	$
Rumble strips (edge lines or centre lines that generate a noise and vibration when driven over)		20-45	20-35	20-45		$$
Lighting		5-10	5-10	5-10	10-20	$$
Removal of roadside objects (e.g. power poles, trees)				60-80		$$
Roadside barriers		20-40		20-40		$$
Dedicated lanes for turning traffic					20-40	$$
Widen sealed edge of road		10-30	10-30	10-30		$$
Improved anti-skid road surface		10-40	10-40	10-40		$$
Overtaking lanes		20-40	20-40	20-40		$$$
Divided roads and /or median barriers			70-90			$$$
Roundabouts					40-80	$$$
Straighten out curvy roads		30-50	30-50	30-50		$$$

NOTE: The effect of combined treatments is not cumulative, as various treatments are often targeting the same types of crashes.

KEY

$	Less than $50,000 per km or low cost
$$	$50,000 to $500,000 per km or medium cost
$$$	Greater than $500,000 per km or high cost

What do I do if I'm driving on a riskier stretch of road?

As a driver you should always take care regardless of the road you drive on. It is always important to adapt your driving to respond to the conditions you face on a particular stretch of road.

Each of the roads highlighted in this report as being higher risk than others are likely to have unique reasons for why they are riskier. Drivers should consider what is contributing to the risk of the particular stretch of road, as this will help them decide how best to respond - remembering that the road, vehicle and driver can all contribute to a safe road system.

Variables to keep in mind when driving, especially on stretches of road with a higher crash risk include:

The Road

Slower driving is required on winding roads, sharp turns or steep gradients and gravel surfaces than on flat, straight stretches. When road conditions change for the worse, reduce your speed so that you are always in control. Some stretches of road are more forgiving than others if you have an accident, depending on the particular roadside features (e.g. trees, ditches) and the engineering features that may be in place to reduce risk (e.g. guardrails or median barriers).

The Weather

Rain quickly reduces tyre grip and hitting ice too fast can be fatal. Wind gusts can side-swipe you unexpectedly, while sun glare or fog can blind you. Drive responsibly and reduce your speed in tricky weather conditions. If weather conditions are poor, consider rescheduling your journey and travel only if you have to.

The Traffic

When traffic is dense, such as in rush hour, during holidays or special events, you need to go with the flow, avoid risky overtaking and remember to keep a safe following distance. There are situations when travelling at the speed limit is not the safe option.

The Unexpected

Children stepping out without looking, heavy vehicles pulling onto the road, livestock and road works can be unexpected and easily surprise you. It is up to you to reduce your speed so you have time to react safely if the unexpected happens.

Your Vehicle

You should always ensure your car is in sound condition and ready for safe travel.

This includes:

- **Warrant of Fitness:** always ensure it's current – but don't rely on that alone.
- **Tyres:** check regularly (including the spare) for correct pressure, and that they have sufficient tread.
- **Lights:** check often or you won't know if bulbs have blown.
- **Windscreen wipers:** replace when worn.
- **Windows and mirrors:** keep them clean. A dirty windscreen can worsen headlight and sun glare and can make it impossible for the driver to see clearly.

Yourself

Fatigue and sleepiness are a major hazard. Schedule a break at least once every two hours and whenever you begin to feel sleepy. During a break get out of your vehicle and have a walk, or some form of exercise, to increase alertness. If you realise you need a nap, don't wait. Find the safest place to pull over and remember to take security precautions (choose a well-lit spot, lock your doors and windows and even phone someone to let them know where you are). Try to avoid napping in the driver's seat, and try not to nap for longer than 40 minutes. Naps up to 40 minutes can be very refreshing, but naps longer than 40 minutes can leave you feeling groggy and disoriented for up to 10 to 15 minutes after you wake up.

Remember, a power nap isn't as regenerative as a good night's sleep. A rested and alert driver can adjust better to the conditions as well as the errors of other drivers. If you have any doubts – don't drive! Be as objective as possible about your fitness to drive, whether the trip is long or short. When you don't feel up to it, postpone the trip or have someone else drive.

Driving requires a high level of concentration and focus, and you should minimise activities that will distract you (for example talking on a cell phone).

Risk Maps – How the sections were defined

For the purpose of comparing the level of risk of crashes between different parts of the network, the state highway network was broken up into road sections (known as 'links').

This report focuses on state highway links that are typically outside the urban area – that is, state highway links that have speed limits of 80km/h or more.

The state highways were split into links using three criteria.

1. To increase the statistical reliability of the results, each link should be long enough to have a minimum of 20 fatal or serious crashes over the last five year period.
2. Links should be meaningful and distinct to drivers, i.e. trips between locations that are understandable and recognisable, such as towns or major intersections.
3. Links should have broadly similar road characteristics along their length, such as one lane in each direction without a median barrier.

The Risk Maps include results for a total of 172 links, and 10,856 kilometres of the state highway network. The links range in length from 2.4 to 318 kilometres, with an average length of 63 kilometres.

Each of these links has been assigned a rating for both Collective and Personal Risk. The methodology used to do this is discussed in the following section.

Measures of risk and what they mean

For the purposes of displaying the safety risk of the state highway network, we look at two different measures of risk, Collective Risk (or Crash Density) and Personal Risk. The focus of both is on crashes where people have been killed or seriously injured. The crash statistics used for the calculations are for the five-year period between 2002–2006.

THE DEFINITIONS OF FATAL AND SERIOUS INJURIES ARE:

FATAL INJURIES – Injuries that result in death within 30 days of the crash.

SERIOUS INJURIES – Fractures, concussion, internal injuries, crushings, severe cuts and lacerations, severe general shock necessitating medical treatment and other injury involving removal to and detention in hospital.

Collective Risk (or Crash Density)

Collective Risk is a measure of the total number of fatal and serious injury crashes per kilometre over a section of road, as described in the following equation. Collective Risk can also be described as the Crash Density.

$$\text{Collective Risk} = \frac{\text{(Fatal crashes + serious injury crashes) / number of years of data}}{\text{Length of road section}}$$

Because Collective Risk is measured in terms of the number of crashes per kilometre of state highway, you would generally expect that those with higher traffic volumes would have a higher Collective Risk. For example SH 1 from Pukerua Bay to MacKays Crossing, or SH 16 north of Auckland.

However, this is not always the case, as some road sections can have a high traffic volume but a relatively low Collective Risk. For example SH 1 between Albany and Orewa. Two road sections could have the same traffic volumes, but because of their engineering have quite different levels of safety – for example a road with a median barrier versus one without, or a roadside free of power poles and other roadside hazards versus a roadside with them.

Personal Risk

Personal Risk is a measure of the danger to each individual using the state highway being assessed.

$$\text{Personal Risk} = \frac{\text{(Fatal crashes + serious injury crashes) / number of years of data}}{\text{Distance travelled / number of years of data}}$$

Unlike Collective Risk, Personal Risk takes into account the traffic volumes on each section of state highway.

Difference between the two risk types

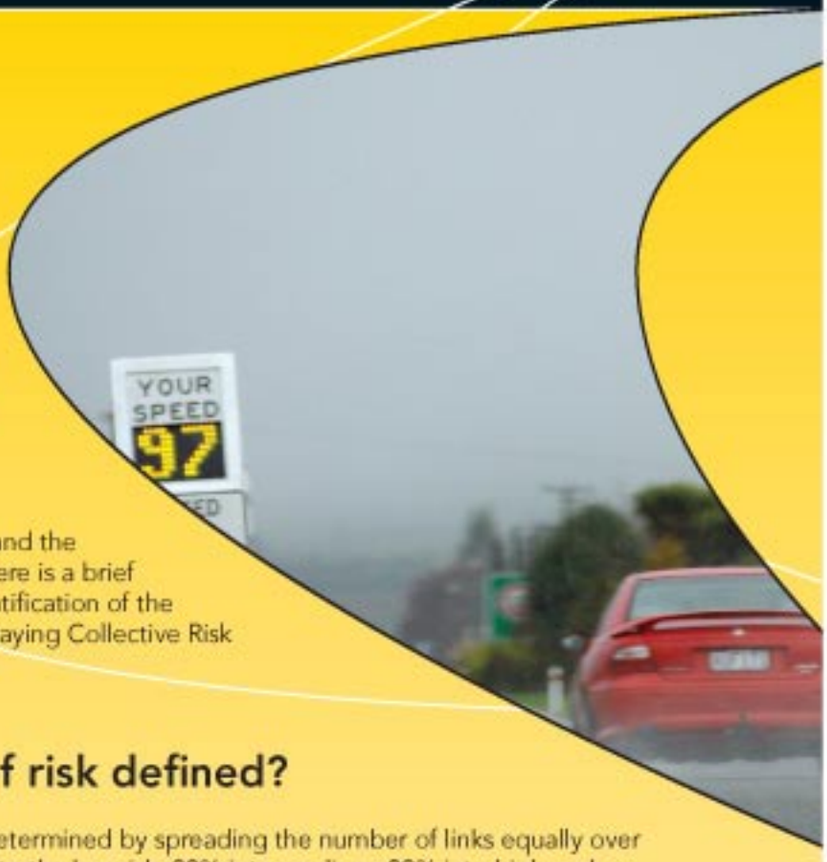
In this report the roads highlighted as being of higher risk than others are likely to have specific reasons why. The road, the car and the driver each contribute to risk.

Collective Risk highlights which road links have a high number of fatal and serious crashes on them – which can be used to help determine where the greatest road safety gains can be made from investment in engineering. Collective Risk is perhaps of most interest to the road controlling authority, Transit New Zealand.

However, as stated previously, risk cannot be eliminated through infrastructure improvements alone. The driver must always share responsibility for a safe road system. The Risk Maps strengthen the connection between infrastructure and personal responsibility by highlighting sections of road where safety improvements are warranted, but also where drivers may need to take extra care to minimise their risk until road improvements are made.

Personal Risk shows the likelihood of a driver, on average, being involved in a fatal or serious road accident on a particular stretch of road. Personal Risk is of most interest to the public, as it shows the risk to road users, as individuals. A risk aware driver will be better informed and more able to identify situations along their journey where they need to modify their behaviour to respond to the conditions. Personal Risk is typically higher in more difficult terrain where traffic volumes and road standards are often lower.

Presentation of Risk Maps



The following section presents the Risk Maps.
The North Island has been split into four regions, and the South Island into two regions. For each region, there is a brief summary of the risks in each region (including identification of the riskiest sections) followed by two maps – one displaying Collective Risk and one displaying Personal Risk.

How are the various levels of risk defined?

The bands for the different risk levels have been determined by spreading the number of links equally over the five risk categories. That is, 20% of the links into the low risk, 20% into medium, 20% into high and so on.

This equates to the following thresholds:

RISK RATING	COLLECTIVE RISK Average annual fatal and serious injury crashes per km	PERSONAL RISK Average annual fatal and serious injury crashes per 100 million vehicle-km	COLOUR
Low	≤0.039	<4	
Low-medium	0.04 ≤ 0.069	4 ≤ 4.9	
Medium	0.07 ≤ 0.10	5 ≤6.9	
Medium-high	0.11 ≤ 0.189	7 ≤ 8.9	
High	0.19+	9+	

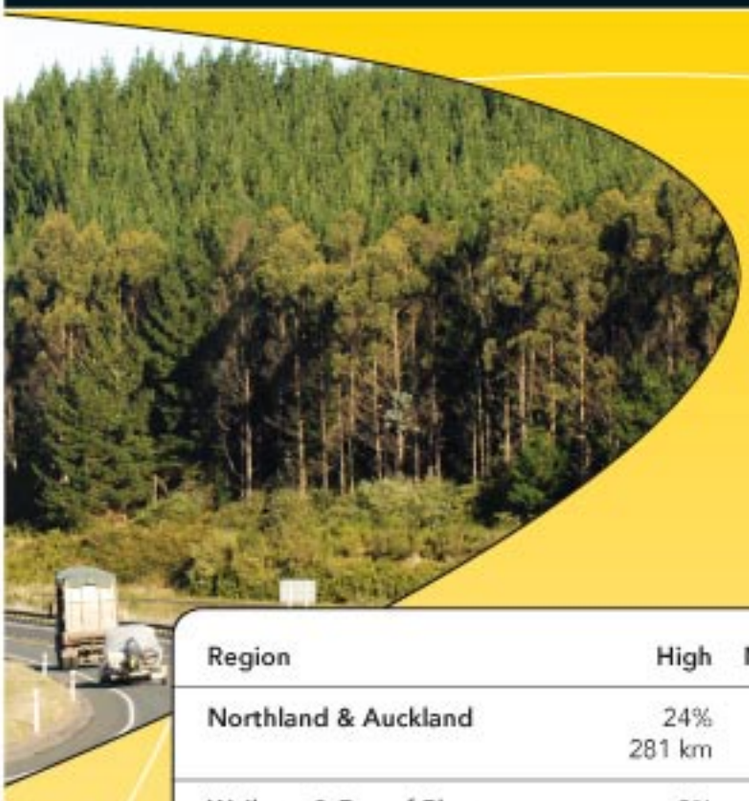
Summary of results

The Collective Risk and Personal Risk tables show the results for each region. The results illustrate what percentages and how many kilometres of the state highway network fall within the five risk categories.

Collective Risk

Region	High	Medium-high	Medium	Low-medium	Low
Northland & Auckland	29% 346 km	11% 136 km	21% 254 km	18% 217 km	20% 233 km
Waikato & Bay of Plenty	11% 241 km	24% 547 km	25% 576 km	27% 620 km	13% 302 km
Gisborne & Hawke's Bay	5% 46 km	8% 76 km	27% 256 km	30% 286 km	31% 300 km
Taranaki, Manawatu-Wanganui & Wellington	9% 149 km	29% 472 km	26% 427 km	20% 324 km	15% 246 km
Tasman, Nelson, Marlborough, West Coast & Canterbury	<1% 10 km	3% 95 km	18% 521 km	24% 686 km	55% 1594 km
Otago & Southland	1% 20 km	12% 234 km	16% 310 km	44% 834 km	26% 499 km
NATIONAL NETWORK	8% 812 km	14% 1560 km	22% 2344 km	27% 2967 km	29% 3174 km

* Percentages may not add to 100% due to rounding



Personal Risk

Region	High	Medium-high	Medium	Low-medium	Low
Northland & Auckland	24% 281 km	21% 248 km	28% 337 km	6% 71 km	21% 249 km
Waikato & Bay of Plenty	9% 196 km	24% 558 km	35% 793 km	23% 530 km	9% 209 km
Gisborne & Hawke's Bay	18% 175 km	53% 513 km	28% 274 km	0	<1% 2 km
Taranaki, Manawatu-Wanganui & Wellington	14% 222 km	19% 306 km	33% 537 km	24% 385 km	10% 167 km
Tasman, Nelson, Marlborough, West Coast & Canterbury	14% 413 km	21% 600 km	26% 767 km	20% 587 km	19% 540 km
Otago & Southland	51% 971 km	25% 478 km	17% 322 km	3% 64 km	3% 61 km
NATIONAL NETWORK	21% 2258 km	25% 2703 km	28% 3030 km	15% 1637 km	11% 1228 km

* Percentages may not add to 100% due to rounding

National Ranking

Collective Risk

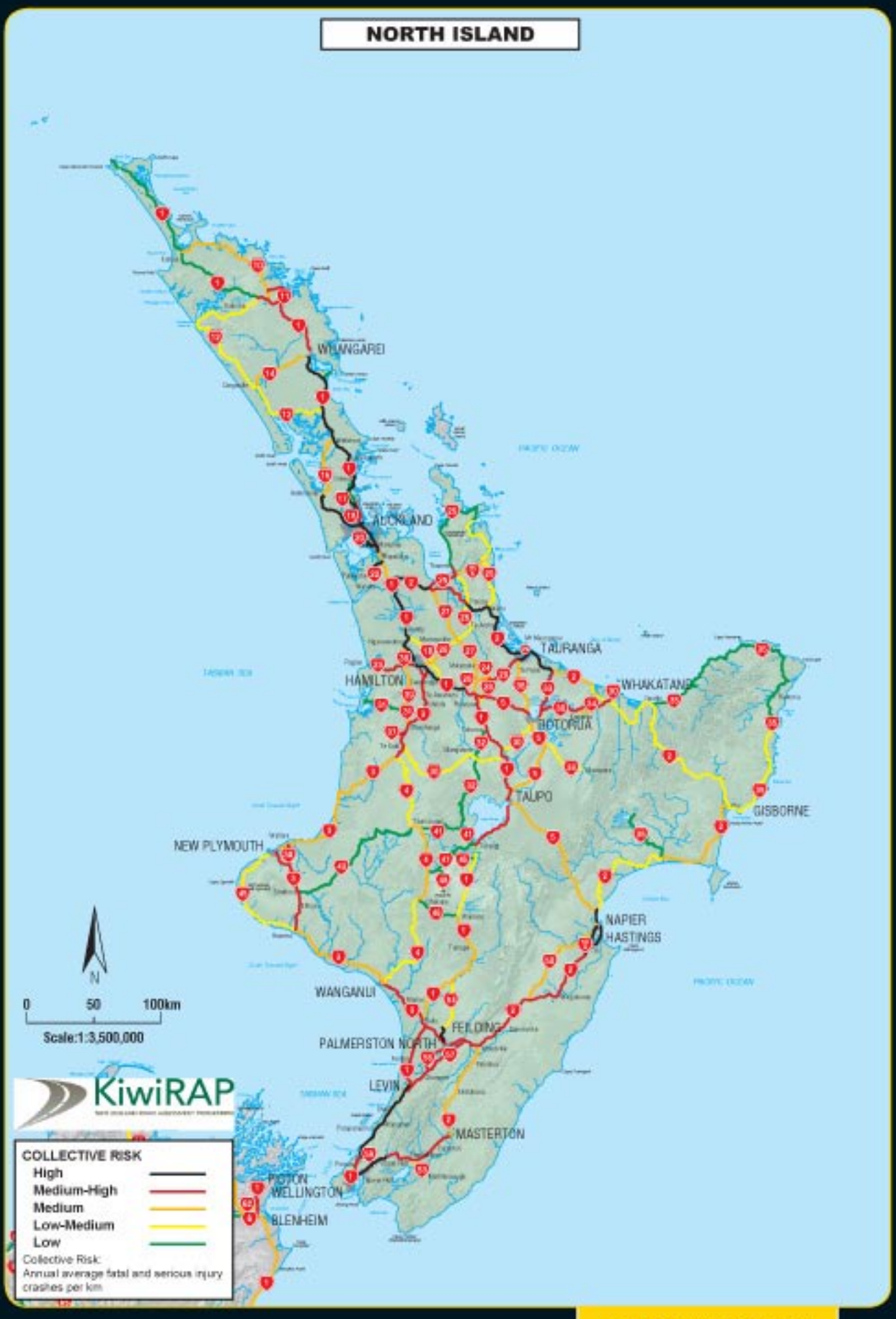
The table below shows the national ranking for the links described as having high Collective Risk.

RANK	LINK	REGION
1	SH 2 from Napier to Hastings	Gisborne and Hawke's Bay
2	SH 2 from Mount Maunganui (SH 29) to Paengaroa (SH 33) 3	Waikato and Bay of Plenty
3	SH 2 from Bay View (SH 5) to Napier	Gisborne and Hawke's Bay
4	SH 22 from Drury to Pukekohe	Northland and Auckland
5	SH 1 from Paraparaumu to Levin	Taranaki, Manawatu-Wanganui and Wellington
6	SH 18 Upper Harbour Highway	Northland and Auckland
7	SH 1 from Warkworth to Wellsford	Northland and Auckland
8	SH 2 from Pokeno (SH 1) to Mangatarata (SH 25)	Waikato and Bay of Plenty
9	SH 1 from Orewa to Warkworth	Northland and Auckland
10	SH 58 from Porirua to SH 2 Upper Hutt	Taranaki, Manawatu-Wanganui and Wellington
11	SH 1A and SH 1 through Orewa	Northland and Auckland
12	SH 1 from Auckland to Takanini	Northland and Auckland
13	SH 29 and SH2 within Tauranga	Waikato and Bay of Plenty
14	SH 1 from Meremere to Rangiriri	Waikato and Bay of Plenty
15	SH 1 from MacKays Crossing to Paraparaumu	Taranaki, Manawatu-Wanganui and Wellington
16	SH 2 from Paeroa to Katikati	Waikato and Bay of Plenty
17	SH 16 from Parnell to Hobsonville	Northland and Auckland
18	SH 1 from Pukerua Bay to MacKays Crossing	Taranaki, Manawatu-Wanganui and Wellington
19	SH 16 from Helensville to West Harbour (SH 18)	Northland and Auckland
20	SH 1 from Marsden Point (SH 15A) to Whangarei	Northland and Auckland
21	SH 1 from Huntly to Hamilton	Waikato and Bay of Plenty
22	SH 2 from Wellington to Upper Hutt	Taranaki, Manawatu-Wanganui and Wellington
23	SH 1 from Ruakaka to Wellsford	Northland and Auckland
24	SH 54 from Feilding to SH 3 (Palmerston North)	Taranaki, Manawatu-Wanganui and Wellington
25	SH 17 Albany to Silverdale	Northland and Auckland
26	SH 2 from Katikati to Tauranga	Waikato and Bay of Plenty
27	SH 1 from SH 74 to SH 73 Christchurch	Tasman, Nelson, Marlborough, West Coast and Canterbury
28	SH 1 from Dunedin to Mosgiel (SH 87)	Otago and Southland
29	SH 20 Wiri to Mt Roskill, SH 20A and SH 20B to Auckland Airport	Northland and Auckland
30	SH 1 from Hamilton to Cambridge	Waikato and Bay of Plenty
31	SH 1 from Cambridge to Piarere (SH 29)	Waikato and Bay of Plenty
32	SH 50 and SH 50A Taradale Rd to Pakipaki	Gisborne and Hawke's Bay

Personal Risk

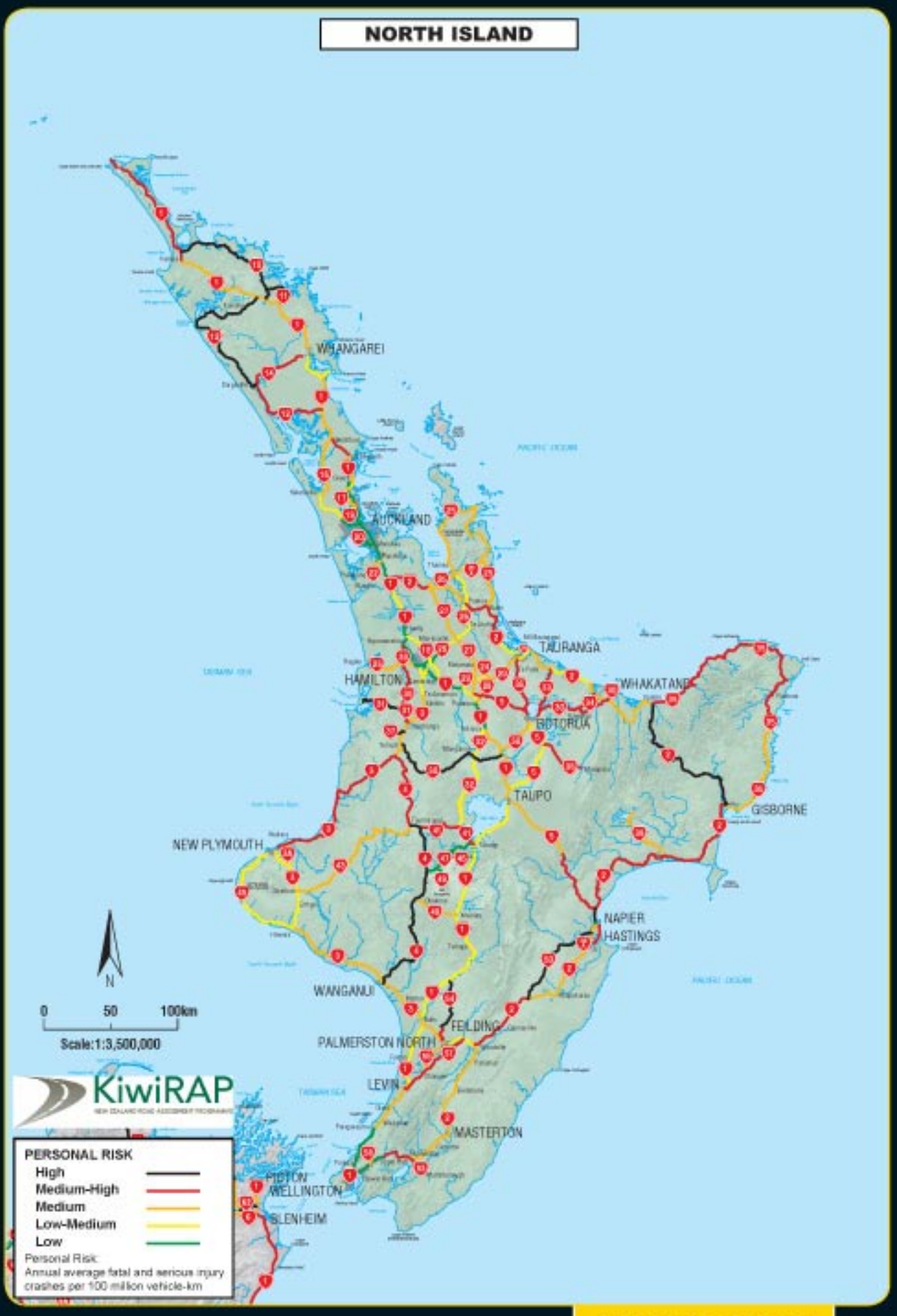
The table below shows the national ranking for the links described as having high Personal Risk.

RANK	LINK	REGION
1	SH 62 from Spring Creek (SH 1) to Renwick (SH 6)	Tasman, Nelson, Marlborough, West Coast and Canterbury
2	SH 37 to Waitomo Caves	Waikato and Bay of Plenty
3	SH 94 from Te Anau to Milford	Otago and Southland
4	SH 4 from Raetihi to Wanganui	Taranaki, Manawatu-Wanganui and Wellington
5	SH 31 from Kawhia to SH 39	Waikato and Bay of Plenty
6	SH 30 from Te Kuiti to Atiamuri	Waikato and Bay of Plenty
7	SH 8 from Alexandra to Milton	Otago and Southland
8	SH 96 from Mataura to Ohai	Otago and Southland
9	SH 1 from Invercargill to Bluff	Otago and Southland
10	SH 11 from Kawakawa to Puketona (SH 10)	Northland and Auckland
11	SH 50 from Napier to Takapau	Gisborne and Hawke's Bay
12	SH 12 from Dargaville to Ohaeawai	Northland and Auckland
13	SH 8 from Omarama to Cromwell and SH 8A	Tasman, Nelson, Marlborough, West Coast and Canterbury and Otago and Southland
14	SH 6 and SH 67 from Murchison to Westport	Tasman, Nelson, Marlborough, West Coast and Canterbury
15	SH 6 from Haast to Wanaka	Tasman, Nelson, Marlborough, West Coast and Canterbury and Otago and Southland
16	SH 8 from Alexandra to Palmerston	Otago and Southland
17	SH 4 from Taumarunui to Raetihi	Taranaki, Manawatu-Wanganui and Wellington
18	SH 2 from Opotiki to Gisborne via Waioeka Gorge	Waikato and Bay of Plenty and Gisborne and Hawke's Bay
19	SH 10 from Awanui to SH 1 south (Pakaraka)	Northland and Auckland
20	SH 94, SH 95, SH 97 from Lumsden to Manapouri	Otago and Southland
21	SH 93 from Clinton to Mataura	Otago and Southland
22	SH 2 from SH 5 Bay View to Napier	Gisborne and Hawke's Bay
23	SH 7 from Hanmer Springs to Reefton	Tasman, Nelson, Marlborough, West Coast and Canterbury
24	SH 60 from Motueka to Collingwood	Tasman, Nelson, Marlborough, West Coast and Canterbury
25	SH 1 from Oamaru to Dunedin	Otago and Southland
26	SH 54 from Vinegar Hill (SH 1) to Feilding	Taranaki, Manawatu-Wanganui and Wellington



COLLECTIVE RISK MAP

COLLECTIVE RISK MAP



PERSONAL RISK MAP

PERSONAL RISK MAP

Northland and Auckland Regions

The combined Northland and Auckland regions have approximately 1,200 kilometres of open road state highway network.

Collective Risk

The state highway network within this combined region has been split into 25 links. The links which have either a high or medium-high Collective Risk are:

1. SH 22 from Drury to Pukekohe
2. SH 18 Upper Harbour Highway
3. SH 1 from Warkworth to Wellsford
4. SH 1 from Orewa to Warkworth
5. SH 1A and SH 1 through Orewa
6. SH 1 from Auckland to Takanini
7. SH 16 from Parnell to Hobsonville
8. SH 16 from Helensville to West Harbour SH 18
9. SH 1 from Marsden Point (SH 15A)
10. SH 1 from Ruakaka to Wellsford to Whangarei
11. SH 17 Albany to Silverdale
12. SH 20, Wiri to Mt Roskill, 20A and 20B to Auckland Airport
13. SH 1 Northern Motorway
14. SH 1 from Whangarei to Ohaeawai
15. SH 11 from Kawakawa to SH 10

The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Collective Risk	High	Medium-high	Medium	Low-medium	Low
Northland and Auckland	29% 346 km	11% 136 km	21% 254 km	18% 217 km	20% 233 km

* Percentages may not add to 100% due to rounding

Personal Risk

The links with either a high or medium-high Personal Risk are:

1. SH 11 from Kawakawa to Puketona (SH 10)
2. SH 12 from Dargaville to Ohaeawai
3. SH 10 from Awanui to SH 1 south (Pakaraka)
4. SH 14 from Whangarei to Dargaville
5. SH 12 from Dargaville to SH 1
6. SH 1 from Warkworth to Wellsford
7. SH 1 from Cape Reinga to Kaitaia

The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Personal Risk	High	Medium-high	Medium	Low-medium	Low
Northland and Auckland	24% 281 km	21% 248 km	28% 337 km	6% 71 km	21% 249 km

* Percentages may not add to 100% due to rounding

Link	Length (km)	Serious Injury Crashes 2002 to 2006	Fatal Crashes 2002 to 2006	Collective Risk Annual average fatal and serious injury crashes per km	Collective Risk Band	Personal Risk Annual average fatal and serious injury crashes per 100 million vehicle-km	Personal Risk Band
SH 1 Northern Motorway	35.5	22	3	0.14	Medium-high	0.7	Low
SH 1 from Albany to Orewa and SH 1A	34.5	4	0	0.02	Low	0.4	Low
SH 1 from Auckland to Takanini	50.7	54	14	0.27	High	1.2	Low
SH 1 from Cape Reinga to Kaitaia	109.8	9	7	0.03	Low	7.6	Medium-high
SH 1 from Kaitaia to Ohaeawai	80.1	11	2	0.03	Low	6.4	Medium
SH 1 from Orewa to Warkworth	26	24	10	0.3	High	5.2	Medium
SH 1 from Ruakaka to Wellsford	53.9	41	12	0.21	High	6.3	Medium
SH 1 from Marsden Point (SH 15A) to Whangarei	24.6	19	8	0.22	High	4.9	Low-medium
SH 1 from Takanini to Pokeno*	48.3	17	6	0.1	Medium	1.1	Low
SH 1 from Warkworth to Wellsford	18.7	18	10	0.31	High	7.7	Medium-high
SH 1 from Whangarei to Ohaeawai	70.6	30	16	0.14	Medium-high	5.6	Medium
SH 1A and SH 1 through Orewa	7.4	5	1	0.28	High	4.8	Low-medium
SH 10 from Awanui to SH 1 South (Pakaraka)	103.8	41	9	0.1	Medium	9.8	High
SH 11 from Kawakawa to Puketona (SH 10)	29.6	14	2	0.13	Medium-high	11.8	High
SH 12 from Dargaville to Ohaeawai	147.6	25	8	0.05	Low-medium	11.1	High
SH 12 from Dargaville to SH 1	69.7	11	6	0.06	Low-medium	7.9	Medium-high
SH 14 from Whangarei to Dargaville	49.6	15	3	0.07	Medium	8.8	Medium-high
SH 15A Marsden Point	8.6	0	1	0.02	Low	4.2	Low-medium
SH 16 from Helensville to West Harbour (SH 18)	30.5	21	7	0.22	High	4.6	Low-medium
SH 16 from Parnell to Hobsonville	37.9	35	7	0.23	High	1.6	Low
SH 16 from Wellsford to Helensville	57.7	12	6	0.07	Medium	5.7	Medium
SH 17 Albany to Silverdale	19.7	15	3	0.2	High	5.5	Medium
SH 18 Upper Harbour Highway	16.4	9	1	0.31	High	5.4	Medium
SH 20 and SH 20A and SH 20B	47.1	35	3	0.19	High	2.2	Low
SH 22 from Drury to Pukekohe	13	17	4	0.33	High	6.3	Medium

* These links cross map boundaries, so will appear in more than one regional list

COLLECTIVE RISK MAP

PERSONAL RISK MAP

Waikato and Bay of Plenty Regions

The combined Waikato and Bay of Plenty regions have approximately 2,300 kilometres of open road state highway network.

Collective Risk

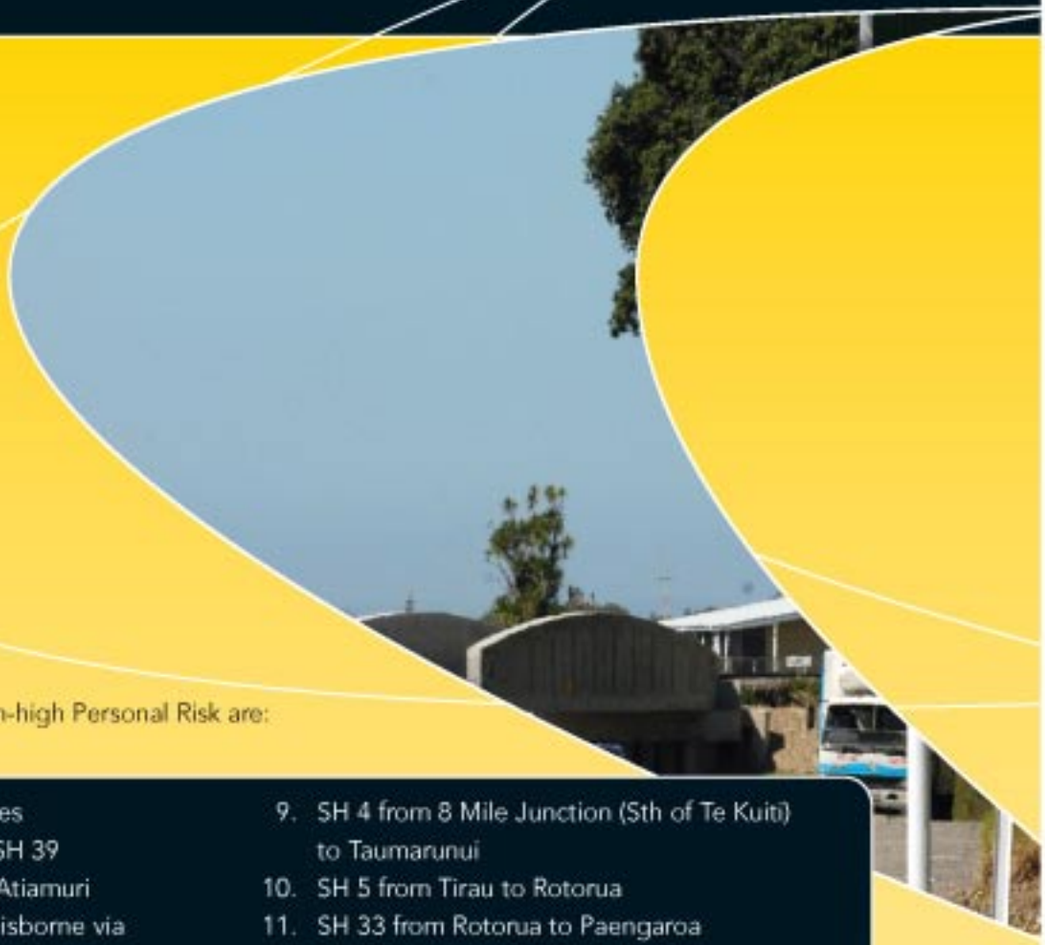
The state highway network within this combined region has been split into 53 links. The links with a high or medium-high Collective Risk are:

1. SH 2 from Mount Maunganui (SH 29) to Paengaroa (SH 33)
2. SH 2 from Pokeno (SH 1) to Mangatarata (SH 25)
3. SH 29 and SH 2 within Tauranga
4. SH 1 from Meremere to Rangiriri
5. SH 2 from Paeroa to Katikati
6. SH 1 from Huntly to Hamilton
7. SH 2 from Katikati to Tauranga
8. SH 1 from Hamilton to Cambridge
9. SH 1 from Cambridge to Piarere (SH 29)
10. SH 29 from Kaimai Ranges to Tauranga
11. SH 3 from Hamilton to Te Awamutu
12. SH 37 to Waitomo Caves
13. SH 5 from Tirau to Rotorua
14. SH 33 from Rotorua to Paengaroa
15. SH 1 from Piarere to Putaruru
16. SH 30 from Rotorua to Whakatane
17. SH 3 from Te Awamutu to Te Kuiti
18. SH 1 from Putaruru to Tokoroa
19. SH 1 from Tokoroa to Taupo
20. SH 23 from Hamilton to Raglan
21. SH 25 from Mangatarata (SH 2) to Thames
22. SH 2 from Mangatarata (SH 25) to Paeroa
23. SH 1 from Taupo to Turangi

The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Collective Risk	High	Medium-high	Medium	Low-medium	Low
Waikato and Bay of Plenty	11% 241 km	24% 547 km	25% 576 km	27% 620 km	13% 302 km

* Percentages may not add to 100% due to rounding



Personal Risk

The links with a high or medium-high Personal Risk are:

1. SH 37 to Waitomo Caves
2. SH 31 from Kawhia to SH 39
3. SH 30 from Te Kuiti to Atiamuri
4. SH 2 from Opotiki to Gisborne via Waioeka Gorge
5. SH 2 from Paeroa to Katikati
6. SH 34 from Edgecumbe (SH 2) to Kawerau (SH 30)
7. SH 38 from Rainbow Mountain to Murupara
8. SH 39 and SH 31 from Ngaruawahia to Otorohanga
9. SH 4 from 8 Mile Junction (Sth of Te Kuiti) to Taumarunui
10. SH 5 from Tirau to Rotorua
11. SH 33 from Rotorua to Paengaroa
12. SH 2 from Pokeno (SH 1) to Mangatarata (SH 25)
13. SH 30 from Rotorua to Whakatane
14. SH 41 from Taumarunui to Turangi
15. SH 36 from Tauranga to Ngongotaha
16. SH 3 from Te Kuiti to New Plymouth

The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Personal Risk	High	Medium-high	Medium	Low-medium	Low
Waikato and Bay of Plenty	9% 196 km	24% 558 km	35% 793 km	23% 530 km	9% 209 km

* Percentages may not add to 100% due to rounding

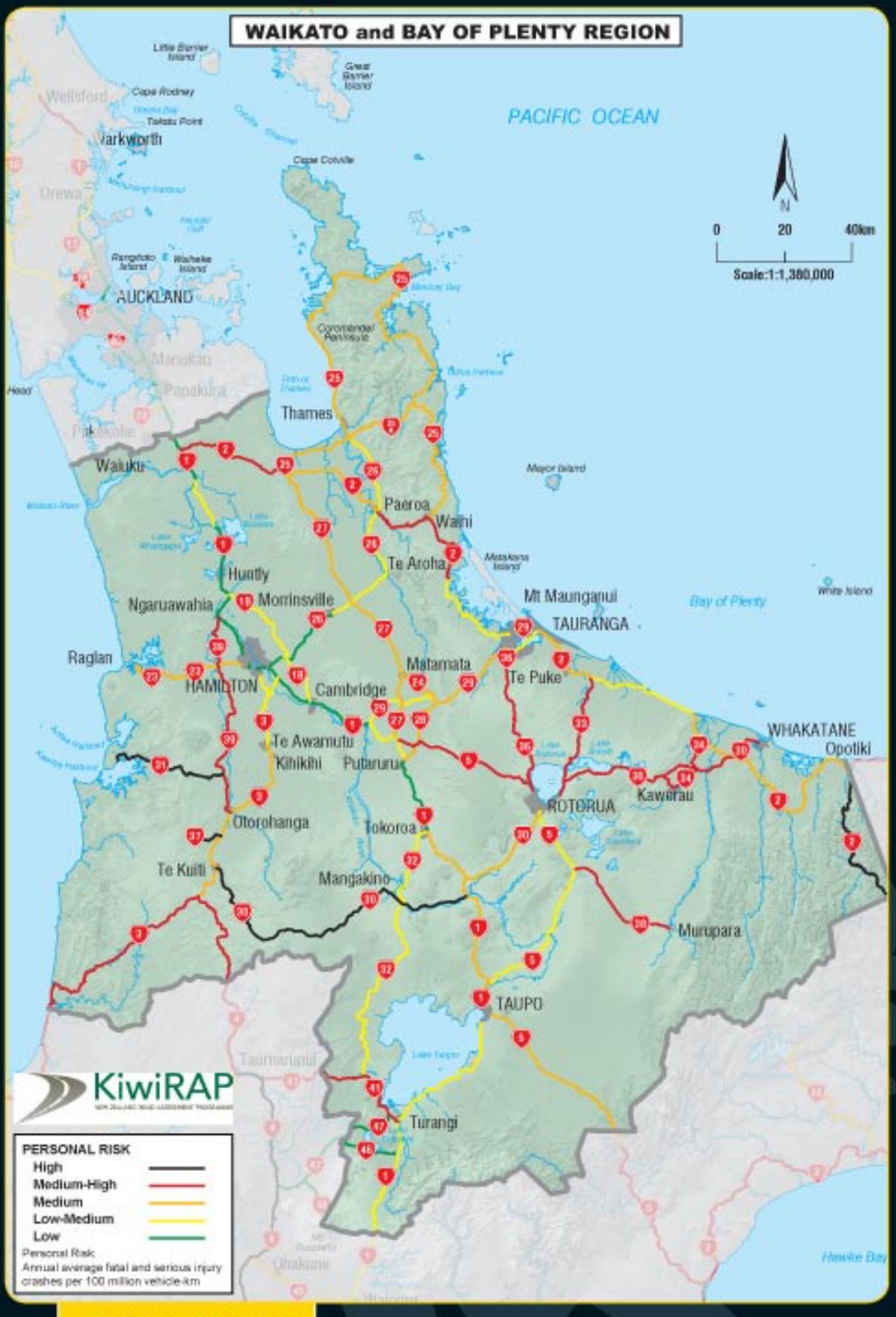
Link	Length (km)	Serious Injury Crashes 2002 to 2006	Fatal Crashes 2002 to 2006	Collective Risk Annual average fatal and serious injury crashes per km	Collective Risk Band	Personal Risk Annual average fatal and serious injury crashes per 100 million vehicle-km	Personal Risk Band
SH 1 from Cambridge to Piarere (SH 29)	20.9	14	4	0.19	High	3.8	Low
SH 1 from Hamilton to Cambridge	19.6	14	3	0.19	High	3.3	Low
SH 1 from Huntly to Hamilton	34.8	18	9	0.22	High	3.1	Low
SH 1 from Meremere to Rangiriri	17.6	13	9	0.25	High	4.5	Low-medium
SH 1 from Piarere to Putaruru	18.9	8	4	0.14	Medium-high	4.7	Low-medium
SH 1 from Pokeno to Meremere	16.7	5	2	0.08	Medium	2.1	Low
SH 1 from Putaruru to Tokoroa	25.8	7	6	0.13	Medium-high	3.9	Low
SH 1 from Rangiriri to Huntly	25.2	4	4	0.07	Medium	1.9	Low
SH 1 from Takanini to Pokeno*	48.3	17	6	0.1	Medium	1.1	Low
SH 1 from Taupiri to Cambridge	45.2	9	3	0.06	Low-medium	4.3	Low-medium
SH 1 from Taupo to Turangi	44.5	9	13	0.11	Medium-high	4.2	Low-medium
SH 1 from Tokoroa to Taupo	64.5	30	11	0.13	Medium-high	5.2	Medium
SH 1 from Turangi to Waiouru*	61.6	12	5	0.06	Low-medium	4.3	Low-medium
SH 2 from Katikati to Tauranga	30.6	19	9	0.2	High	4.3	Low-medium
SH 2 from Mangatarata (SH 25) to Paeroa	38.1	12	6	0.11	Medium-high	5.5	Medium
SH 2 from Matata to Opotiki	78.4	14	7	0.06	Low-medium	6.6	Medium
SH 2 from Opotiki to Gisborne via Waioeka Gorge*	138	26	12	0.06	Low-medium	9.9	High
SH 2 from Paeroa to Katikati	45.1	40	8	0.24	High	8.9	Medium-high
SH 2 from Pokeno (SH 1) to Mangatarata (SH 25)	35.6	37	18	0.31	High	7.4	Medium-high
SH 2 from Mount Maunganui (SH 29) to Paengaroa (SH 33)	24.4	22	12	0.38	High	5.9	Medium
SH 2 from SH 33 to Matata	33.8	9	5	0.08	Medium	4	Low-medium
SH 3 from Hamilton to Te Awamutu	30.2	15	5	0.16	Medium-high	4.6	Low-medium
SH 3 from Te Awamutu to Te Kuiti	60.3	24	8	0.13	Medium-high	6	Medium
SH 3 from Te Kuiti to New Plymouth*	145.8	48	13	0.09	Medium	7.1	Medium-high
SH 4 from 8 Mile Junction (Sth of Te Kuiti) to Taumarunui*	69.6	14	5	0.05	Low-medium	7.7	Medium-high

* These links cross map boundaries, so will appear in more than one regional list

Link	Length (km)	Serious Injury Crashes 2002 to 2006	Fatal Crashes 2002 to 2006	Collective Risk Annual average fatal and serious injury crashes per km	Collective Risk Band	Personal Risk Annual average fatal and serious injury crashes per 100 million vehicle-km	Personal Risk Band
SH 5 from Rotorua to Wairakei	69.8	21	9	0.09	Medium	4.2	Low-medium
SH 5 from Taupo to Tarawera*	60.9	15	7	0.07	Medium	5.4	Medium
SH 5 from Tirau to Rotorua	46.5	23	12	0.15	Medium-high	7.6	Medium-high
SH 23 from Hamilton to Raglan	40.1	19	4	0.12	Medium-high	6.3	Medium
SH 24 and SH 21 from Matamata to Putararu	33.8	8	1	0.06	Low-medium	5.3	Medium
SH 25 from Mangatarata (SH 2) to Thames	29.9	13	0	0.11	Medium-high	5.5	Medium
SH 25 from Thames to Whitianga via Coromandel	95.5	9	5	0.03	Low	6	Medium
SH 25 from Whitianga to Waihi	105.4	17	3	0.04	Low-medium	5.3	Medium
SH 25A from Kopu to Hikuai	28.2	6	4	0.07	Medium	5.7	Medium
SH 26 from Hamilton to Morrinsville	27.5	9	0	0.07	Medium	3.6	Low
SH 26 from Morrinsville to Kopu	68.1	11	4	0.05	Low-medium	4.1	Low-medium
SH 27 from Mangatarata (SH 2) to Tirau	92.5	32	14	0.1	Medium	5.3	Medium
SH 29 and SH2 within Tauranga	12.5	13	4	0.27	High	4.1	Low-medium
SH 29 from Kaimai Ranges to Tauranga	30.8	18	9	0.18	Medium-high	5.2	Medium
SH 29 from Piarere to the Kaimai Ranges	23.7	7	2	0.08	Medium	4.3	Low-medium
SH 30 from Rotorua to Atiamuri	31.8	9	0	0.06	Low-medium	6.7	Medium
SH 30 from Rotorua to Whakatane	70.2	35	8	0.14	Medium-high	7.4	Medium-high
SH 30 from Te Kuiti to Atiamuri	104.9	18	3	0.04	Low-medium	14.1	High
SH 31 from Kawhia to SH 39	42.5	5	1	0.03	Low	15.5	High
SH 32 from Tokoroa to Kuratau	94.7	7	0	0.02	Low	4.2	Low-medium
SH 33 from Rotorua to Paengaroa	40	20	9	0.15	Medium-high	7.5	Medium-high
SH 34 from Edgecumbe (SH 2) to Kawerau (SH 30)	25.2	6	5	0.09	Medium	8.9	Medium-high
SH 36 Tauranga to Ngongotaha	47.1	17	1	0.08	Medium	7.2	Medium-high
SH 37 to Waitomo Caves	7.3	5	1	0.16	Medium-high	32.1	High
SH 38 from Rainbow Mountain to Murupara	36.4	8	2	0.05	Low-medium	8.4	Medium-high
SH 39 and SH 31 from Ngaruawahia to Otorohanga	70.5	24	6	0.09	Medium	8	Medium-high
SH 41 from Taumarunui to Turangi*	58.4	8	0	0.03	Low	7.4	Medium-high
SH 46 SH 47 SH 48 from National Park to Turangi*	72.4	5	0	0.01	Low	2.5	Low

* These links cross map boundaries, so will appear in more than one regional list

COLLECTIVE RISK MAP



PERSONAL RISK MAP

Gisborne and Hawke's Bay Regions

The combined Gisborne and Hawke's Bay regions have approximately 1,000 kilometres of open road state highway network.

Collective Risk

The state highway network within this combined region has been split into 15 links. The links with a high or medium-high Collective Risk are:

1. SH 2 from Napier to Hastings
2. SH 2 from SH 5 Bay View to Napier
3. SH 50 and SH 50A Taradale Road to Pakipaki
4. SH 2 from Takapau to Hastings
5. SH 2 from Takapau to Woodville

The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Collective Risk	High	Medium-high	Medium	Low-medium	Low
Gisborne and Hawke's Bay	5% 46 km	8% 76 km	27% 256 km	30% 286 km	31% 300 km

* Percentages may not add to 100% due to rounding

Personal Risk

The links with a high or medium-high Personal Risk are:

1. SH 50 from Napier to Takapau
2. SH 2 from Opotiki to Gisborne via Waioeka Gorge
3. SH 2 from SH 5 Bay View to Napier
4. SH 2 from Gisborne to Wairoa
5. SH 35 from Opotiki to Tokomaru Bay
6. SH 2 from Napier to Hastings
7. SH 2 from Wairoa to SH 5 Napier
8. SH 5 from Tarawera to SH 2 Bay View (North of Napier)
9. SH 2 from Takapau to Woodville

The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Personal Risk	High	Medium-high	Medium	Low-medium	Low
Gisborne and Hawke's Bay	18% 175 km	53% 513 km	28% 274 km	0%	<1% 2 km

* Percentages may not add to 100% due to rounding

Link	Length (km)	Serious Injury Crashes 2002 to 2006	Fatal Crashes 2002 to 2006	Collective Risk Annual average fatal and serious injury crashes per km	Collective Risk Band	Personal Risk Annual average fatal and serious injury crashes per 100 million vehicle-km	Personal Risk Band
SH 2 from Gisborne to Wairoa	89.5	22	7	0.07	Medium	8.7	Medium-high
SH 2 from Napier to Hastings	14.3	22	6	0.4	High	8.2	Medium-high
SH 2 from Opotiki to Gisborne via Waioeka Gorge*	138	26	12	0.06	Low-medium	9.9	High
SH 2 from SH 5 Bay View to Napier	9.2	9	4	0.35	High	9.6	High
SH 2 from Takapau to Hastings	68.8	33	13	0.15	Medium-high	5.9	Medium
SH 2 from Takapau to Woodville*	58.9	31	4	0.13	Medium-high	7	Medium-high
SH 2 from Wairoa to SH 5 Napier	104.3	26	2	0.05	Low-medium	8.1	Medium-high
SH 2B Airport to Taradale Rd	2.4	1	0	0.08	Medium	2.8	Low
SH 5 from Tarawera to SH 2 Bay View (North of Napier)	61.5	22	8	0.1	Medium	7.5	Medium-high
SH 5 from Taupo to Tarawera*	60.9	15	7	0.07	Medium	5.4	Medium
SH 35 from Opotiki to Tokomaru Bay	236.1	17	10	0.02	Low	8.4	Medium-high
SH 35 from Tokomaru Bay to Gisborne	97.2	13	4	0.04	Low-medium	6.5	Medium
SH 38 from Wairoa to Waikaremoana	64	2	1	0.01	Low	6	Medium
SH 50 and SH 50A Taradale Rd to Pakipaki	22.6	14	8	0.19	High	5.5	Medium
SH 50 from Napier to Takapau	81.6	21	7	0.07	Medium	11.5	High

* These links cross map boundaries, so will appear in more than one regional list

COLLECTIVE RISK MAP

PERSONAL RISK MAP

Taranaki, Manawatu-Wanganui and Wellington Regions

The combined Taranaki, Manawatu-Wanganui and Wellington regions have approximately 1,600 kilometres of open road state highway network.

Collective Risk

The state highway network within this combined region has been split into 31 links. The links with a high or medium-high Collective Risk are:

1. SH 1 from Paraparaumu to Levin
2. SH 58 from Porirua to SH 2 Upper Hutt
3. SH 1 from MacKays Crossing to Paraparaumu
4. SH 1 from Pukerua Bay to MacKays Crossing
5. SH 2 from Wellington to Upper Hutt
6. SH 54 from Feilding to SH 3 Palmerston North
7. SH 1 from Wellington to Paramata Roundabout
8. SH 2 from Featherston to Upper Hutt
9. SH 2 from Featherston to Masterton
10. SH 3 and SH 1 from Wanganui to Palmerston North
11. SH 2 from Takapau to Woodville
12. SH 3 from Palmerston North to Woodville
13. SH 57 from Levin to Ashhurst
14. SH 3 and SH 3A from New Plymouth and Waitara to Hawera
15. SH 1 from Sanson to Levin
16. SH 56 from Makerua (SH 57) to Palmerston North

The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Collective Risk	High	Medium-high	Medium	Low-medium	Low
Taranaki, Manawatu-Wanganui and Wellington	9% 149 km	29% 472 km	26% 427 km	20% 324 km	15% 246 km

* Percentages may not add to 100% due to rounding

Personal Risk

The links with a high or medium-high Personal Risk are:

1. SH 4 from Raetihi to Wanganui
2. SH 4 from Taumarunui to Raetihi
3. SH 54 from Vinegar Hill (SH 1) to Feilding
4. SH 53 from Featherson to Martinborough
5. SH 57 from Levin to Ashhurst
6. SH 4 from 8 Mile Junction (Sth of Te Kuiti) to Taumarunui
7. SH 54 from Feilding to SH 3 Palmerston North
8. SH 41 from Taumarunui to Turangi
9. SH 2 from Featherston to Upper Hutt
10. SH 3 from Te Kuiti to New Plymouth
11. SH 2 from Takapau to Woodville

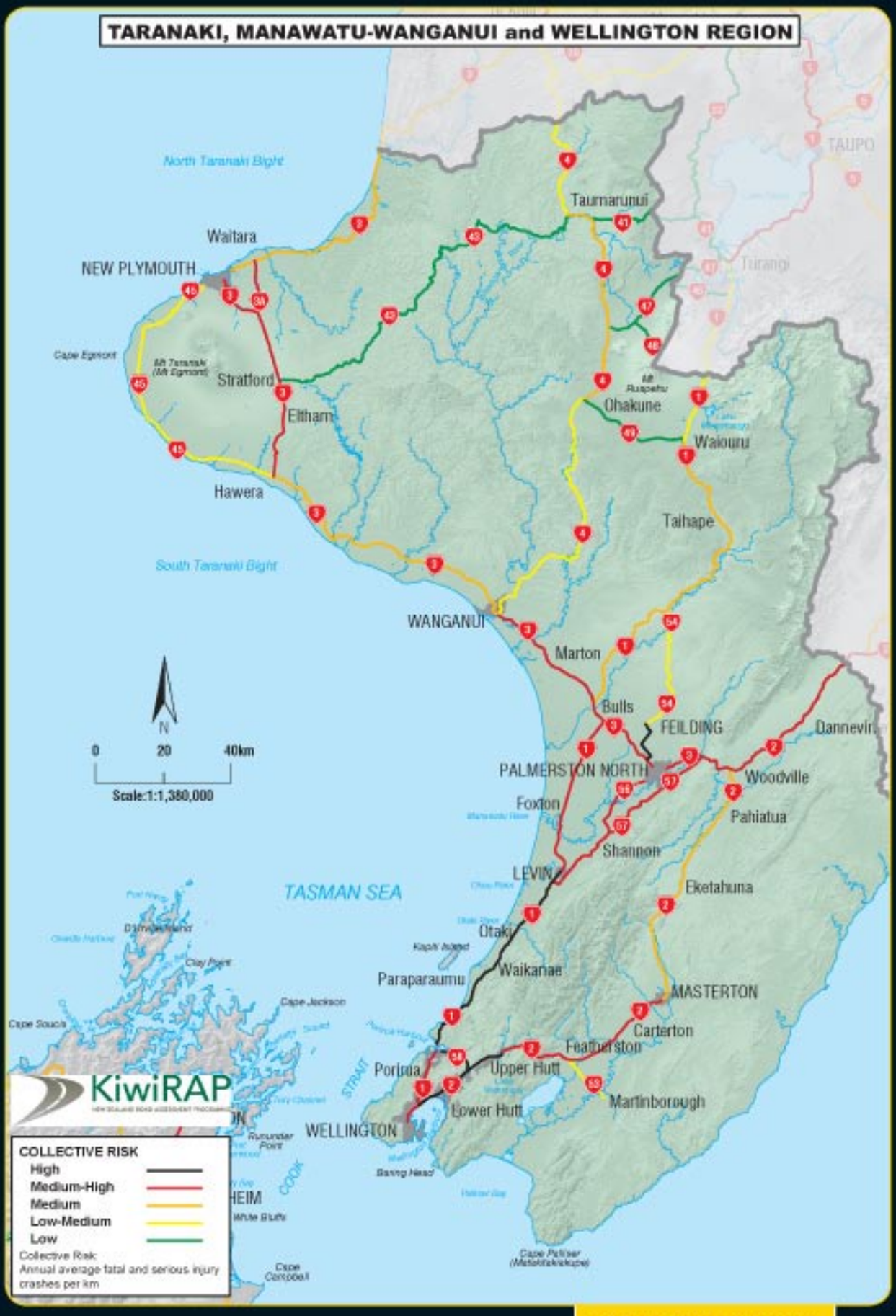
The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Personal Risk	High	Medium-high	Medium	Low-medium	Low
Taranaki, Manawatu-Wanganui and Wellington	14% 222 km	19% 306 km	33% 537 km	24% 385 km	10% 167 km

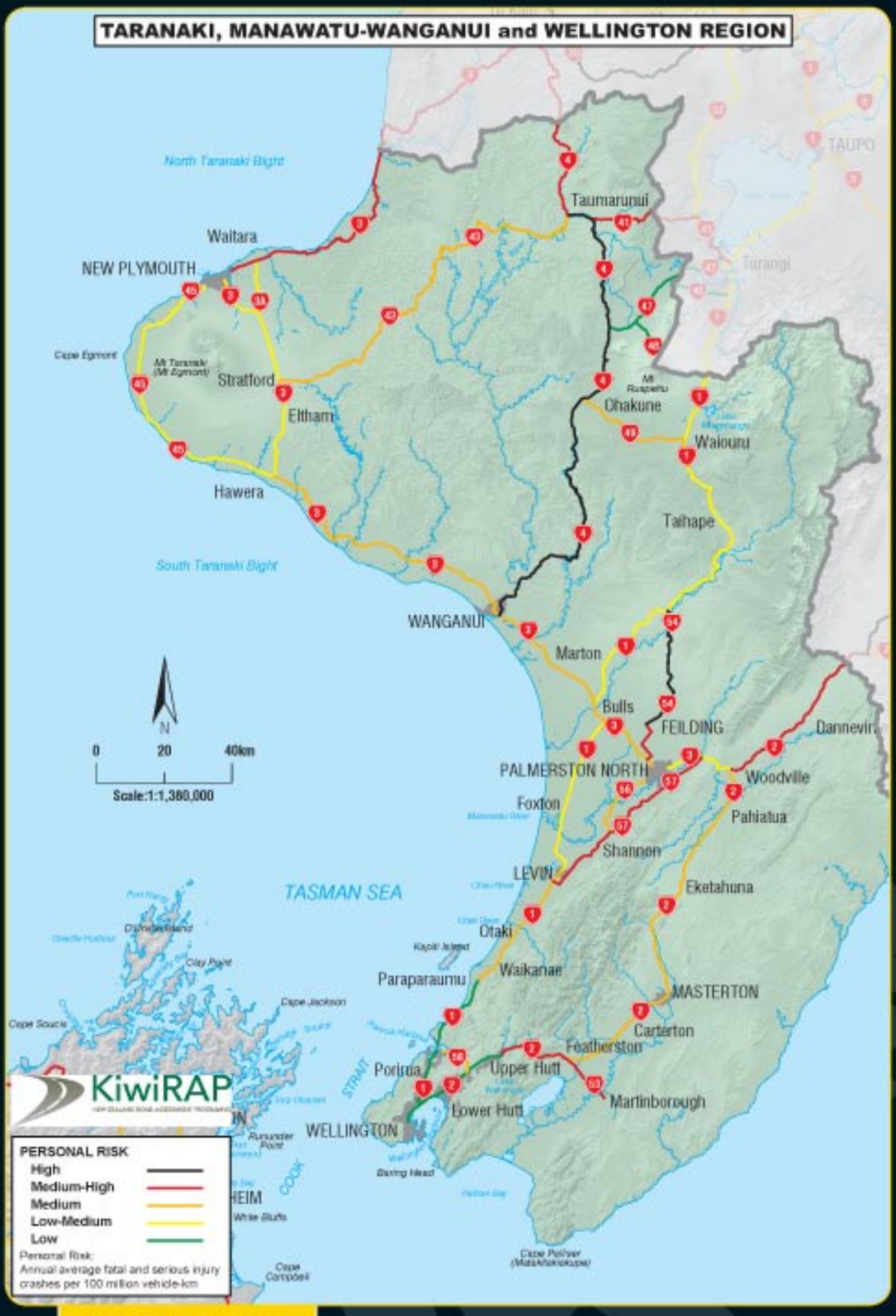
* Percentages may not add to 100% due to rounding

Link	Length (km)	Serious Injury Crashes 2002 to 2006	Fatal Crashes 2002 to 2006	Collective Risk Annual average fatal and serious injury crashes per km	Collective Risk Band	Personal Risk Annual average fatal and serious injury crashes per 100 million vehicle-km	Personal Risk Band
SH 1 from MacKays Crossing to Paraparaumu	10	8	3	0.25	High	3.8	Low
SH 1 from Paraparaumu to Levin	42	44	15	0.33	High	5.2	Medium
SH 1 from Pukerua Bay to MacKays Crossing	21.4	14	8	0.23	High	3.4	Low
SH 1 from Sanson to Levin	49.7	22	3	0.11	Medium-high	4.5	Low-medium
SH 1 from Turangi to Waiouru*	61.6	12	5	0.06	Low-medium	4.3	Low-medium
SH 1 from Waiouru to Bulls	110.1	36	10	0.09	Medium	4.8	Low-medium
SH 1 from Wellington to Paramata Roundabout	48.7	31	7	0.16	Medium-high	1.7	Low
SH 2 from Featherston to Masterton	35	15	4	0.15	Medium-high	5.3	Medium
SH 2 from Featherston to Upper Hutt	27.9	18	2	0.15	Medium-high	7.1	Medium-high
SH 2 from Takapau to Woodville*	58.9	31	4	0.13	Medium-high	7	Medium-high
SH 2 from Wellington to Upper Hutt	48.4	40	11	0.22	High	2.8	Low
SH 2 from Woodville to Masterton	81.6	16	8	0.07	Medium	5.4	Medium
SH 3 and 3A from New Plymouth and Waitara to Hawera	83	29	9	0.11	Medium-high	4.4	Low-medium
SH 3 and SH 1 from Wanganui to Palmerston North	68.4	36	10	0.14	Medium-high	5	Medium
SH 3 from Hawera to Wanganui	91.8	29	8	0.09	Medium	6.8	Medium
SH 3 from Palmerston North to Woodville	23.6	11	3	0.13	Medium-high	4.9	Low-medium
SH 3 from Te Kuiti to New Plymouth*	145.8	48	13	0.09	Medium	7.1	Medium-high
SH 4 from 8 Mile Junction (Sth of Te Kuiti) to Taumarunui*	69.6	14	5	0.05	Low-medium	7.7	Medium-high
SH 4 from Raetihi to Wanganui	97.4	22	7	0.06	Low-medium	16	High
SH 4 from Taumarunui to Raetihi	68.9	22	2	0.07	Medium	10	High
SH 41 from Taumarunui to Turangi*	58.4	8	0	0.03	Low	7.4	Medium-high
SH 43 from Stratford to Taumarunui	148	5	2	0.01	Low	6.7	Medium
SH 45 from New Plymouth to Hawera	97.3	11	5	0.04	Low-medium	4.3	Low-medium
SH 46 SH 47 SH 48 from National Park to Turangi*	72.4	5	0	0.01	Low	2.5	Low
SH 49 from SH 4 to Waiouru	36.1	5	1	0.03	Low	5.7	Medium
SH 53 from Featherston to Martinborough	17.7	3	1	0.05	Low-medium	8.6	Medium-high
SH 54 from Feilding to SH 3 Palmerston North	13.5	9	4	0.21	High	7.7	Medium-high
SH 54 from Vinegar Hill (SH 1) to Feilding	42.9	7	2	0.04	Low-medium	9.2	High
SH 56 from Makerua (SH 57) to Palmerston North	20.9	5	6	0.11	Medium-high	6	Medium
SH 57 from Levin to Ashhurst	63.5	33	8	0.13	Medium-high	7.8	Medium-high
SH 58 from Porirua to SH 2 Upper Hutt	13.2	15	5	0.3	High	6.8	Medium

* These links cross map boundaries, so will appear in more than one regional list



COLLECTIVE RISK MAP



PERSONAL RISK MAP

Tasman, Nelson, Marlborough, West Coast and Canterbury Regions

The combined Tasman, Nelson, Marlborough, West Coast and Canterbury regions have approximately 2,900 kilometres of open road state highway network.

Collective Risk

The state highway network within this combined region has been split into 36 links. The links with a high or medium-high Collective Risk are:

1. SH 1 from SH 74 to SH 73 Christchurch
2. SH 1 from Picton to Blenheim
3. SH 60 from Richmond to Motueka
4. SH 1 from Waipara to Kaiapoi

The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Collective Risk	High	Medium-high	Medium	Low-medium	Low
Tasman, Nelson, Marlborough, West Coast and Canterbury	<1% 10 km	3% 95 km	18% 521 km	24% 686 km	55% 1594 km

* Percentages may not add to 100% due to rounding

Personal Risk

The links with a high or medium-high Personal Risk are:

1. SH 62 from Spring Creek (SH 1) to Renwick (SH 6)
2. SH 6 and SH 67 from Murchison to Westport
3. SH 6 from Haast to Wanaka
4. SH 7 from Hanmer Springs to Reefton
5. SH 60 from Motueka to Collingwood
6. SH 1 from Kaikoura to Waipara
7. SH 1 from Blenheim to Kaikoura
8. SH 6 from Havelock to Nelson
9. SH 6 from Westport to Greymouth
10. SH 69 and SH 7 from Inangahua Junction (SH 6) to Greymouth
11. SH 65 from Ariki (SH 6) to Springs Junction

The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Personal Risk	High	Medium-high	Medium	Low-medium	Low
Tasman, Nelson, Marlborough, West Coast and Canterbury	14% 413 km	21% 600 km	26% 767 km	20% 587 km	19% 540 km

* Percentages may not add to 100% due to rounding

Link	Length (km)	Serious Injury Crashes 2002 to 2006	Fatal Crashes 2002 to 2006	Collective Risk Annual average fatal and serious injury crashes per km	Collective Risk Band	Personal Risk Annual average fatal and serious injury crashes per 100 million vehicle-km	Personal Risk Band
SH 1 Christchurch Northern Motorway	17.9	2	2	0.04	Low-medium	0.9	Low
SH 1 from Ashburton to Timaru	70.9	13	6	0.06	Low-medium	2.2	Low
SH 1 from Blenheim to Kaikoura	129.2	33	14	0.08	Medium	7.7	Medium-high
SH 1 from Christchurch to Ashburton	71.1	25	9	0.1	Medium	2.5	Low
SH 1 from Kaikoura to Waipara	123.7	36	13	0.08	Medium	8.1	Medium-high
SH 1 from Picton to Blenheim	27.9	13	5	0.15	Medium-high	6.3	Medium
SH 1 from SH 74 to SH 73 Christchurch	10	8	2	0.2	High	2.9	Low
SH 1 from Timaru to Oamaru*	93.2	27	6	0.09	Medium	4.9	Low-medium
SH 1 from Waipara to Kaiapoi	34.8	16	6	0.14	Medium-high	4.6	Low-medium
SH 6 and SH 67 from Murchison to Westport	95.7	14	5	0.04	Low-medium	10.2	High
SH 6 from Blenheim to Havelock	40.5	13	4	0.1	Medium	5.9	Medium
SH 6 from Greymouth to Haast	317.8	25	4	0.02	Low	4.9	Low-medium
SH 6 from Haast to Wanaka*	137.8	17	3	0.03	Low	10	High
SH 6 from Havelock to Nelson	73	31	6	0.1	Medium	7.5	Medium-high
SH 6 from Richmond to Murchison	109.2	28	6	0.06	Low-medium	6.7	Medium
SH 6 from Westport to Greymouth	93.2	10	6	0.04	Low-medium	7.5	Medium-high
SH 7 and SH 7A from Waipara to Hanmer Springs	76.1	11	6	0.05	Low-medium	4.9	Low-medium
SH 7 from Hanmer Springs to Reefton	128	16	5	0.03	Low	9.5	High
SH 8 from Fairlie to Omarama*	129.7	16	4	0.03	Low	5.6	Medium
SH 8 from Timaru to Fairlie	57.2	5	2	0.03	Low	3.1	Low
SH 60 from Motueka to Collingwood	84	24	0	0.06	Low-medium	9.4	High
SH 60 from Richmond to Motueka	32.5	17	6	0.15	Medium-high	5.8	Medium
SH 62 from Spring Creek (SH 1) to Renwick (SH 6)	12.7	2	4	0.09	Medium	722.4	High
SH 63 from Renwick to Kawatiri	117	10	1	0.02	Low	6.7	Medium
SH 65 from Ariki (SH 6) to Springs Junction	71.4	6	2	0.02	Low	7.1	Medium-high
SH 67 from Westport to Karamea	46.8	1	0	0.01	Low	1.4	Low
SH 69 and SH 7 from Inangahua Junction (SH 6) to Greymouth	109.6	14	2	0.03	Low	7.2	Medium-high
SH 73 from Christchurch to Darfield	33.8	7	1	0.05	Low-medium	2.9	Low
SH 73 from Darfield to Kumara	182.7	24	4	0.03	Low	6.1	Medium
SH 74 from Main North Rd to Burwood Rd	6.3	1	0	0.03	Low	0.6	Low
SH 75 from Christchurch to Akaroa	72.7	20	2	0.06	Low-medium	5.2	Medium
SH 77 from Ashburton to Darfield	93.7	6	1	0.02	Low	3.9	Low
SH 79 from Fairlie to Rangitata	61	5	0	0.02	Low	2.8	Low
SH 80 from Twizel to Mt Cook	54.6	3	1	0.01	Low	5.1	Medium
SH 82 from Kurow to SH 1	71	2	0	0.01	Low	2.6	Low
SH 83 from Omarama to SH 1*	109.2	5	3	0.02	Low	4.2	Low-medium

* These links cross map boundaries, so will appear in more than one regional list

COLLECTIVE RISK MAP

PERSONAL RISK MAP

Otago and Southland Regions

The combined Otago and Southland regions have approximately 1,900 kilometres of open road state highway network.

Collective Risk

The state highway network within this combined region has been split into 25 links. The links with a high or medium-high Collective Risk are:

1. SH 1 from Dunedin to Mosgiel (SH 87)
2. SH 1 from Mosgiel to Milton
3. SH 1 from Oamaru to Dunedin
4. SH 6 from Cromwell to Queenstown
5. SH 1 from Invercargill to Bluff

The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Collective Risk	High	Medium-high	Medium	Low-medium	Low
Otago and Southland	1% 20 km	12% 234 km	16% 310 km	44% 834 km	26% 499 km

* Percentages may not add to 100% due to rounding

Personal Risk

The links with a high or medium-high Personal Risk are:

1. SH 94 from Te Anau to Milford
2. SH 8 from Alexandra to Milton
3. SH 96 from Mataura to Ohai
4. SH 1 from Invercargill to Bluff
5. SH 8 from Omarama to Cromwell and SH 8A
6. SH 6 from Haast to Wanaka
7. SH 8 from Alexandra to Palmerston
8. SH 94, SH 95, SH 97 from Lumsden to Manapouri
9. SH 93 from Clinton to Mataura
10. SH 1 from Oamaru to Dunedin
11. SH 90 from Rays Junction to Gore
12. SH 98 and SH 99 from Dacre (SH 1) to Clifden
13. SH 6 from Cromwell to Queenstown
14. SH 1 from Milton to Gore
15. SH 1 from Mosgiel to Milton
16. SH 87 from Kyeburn to Mosgiel

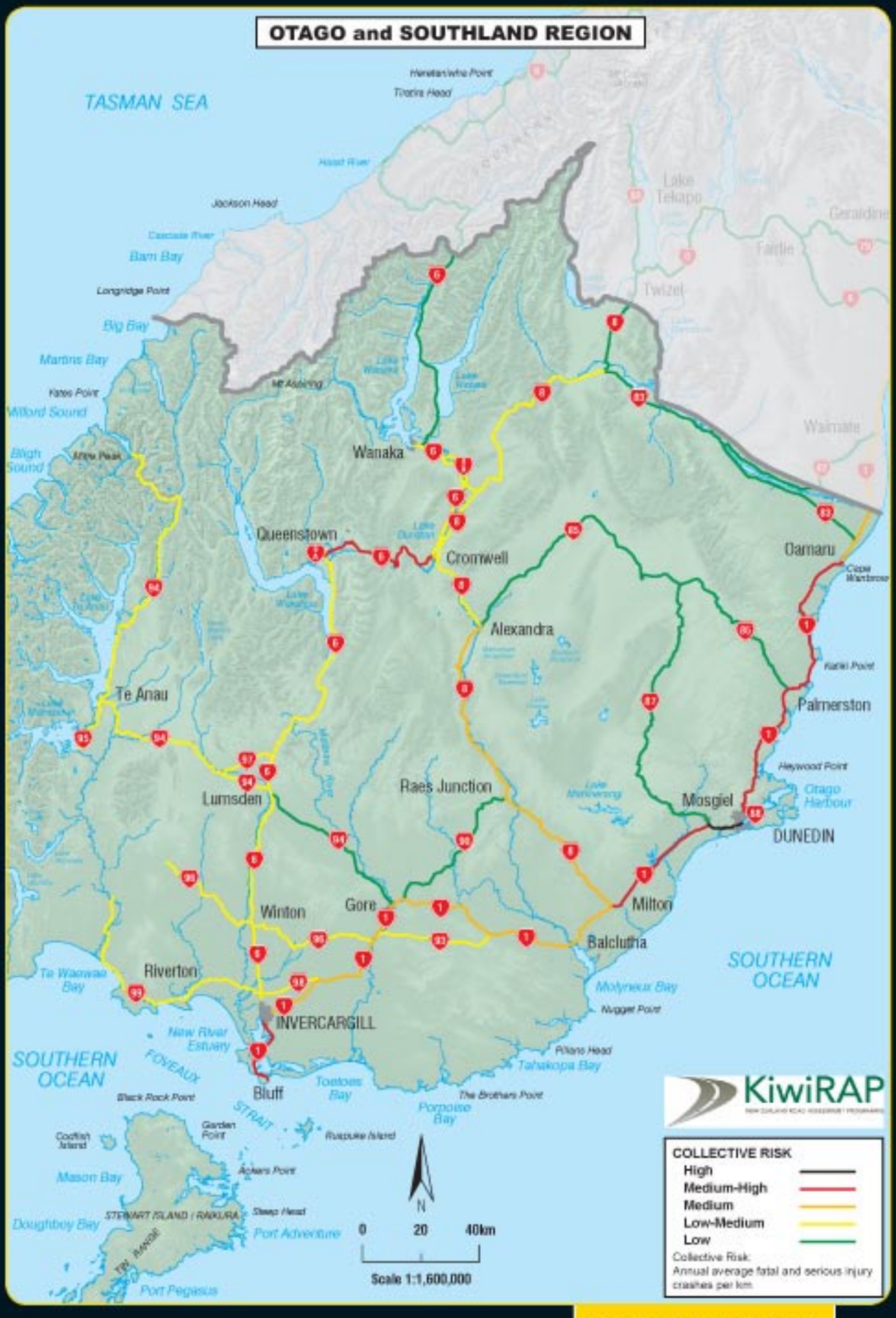
The percentage of kilometres and length of the state highway network within each risk category are shown in the table below.

Personal Risk	High	Medium-high	Medium	Low-medium	Low
Otago and Southland	51% 971 km	25% 478 km	17% 322 km	3% 64 km	3% 61 km

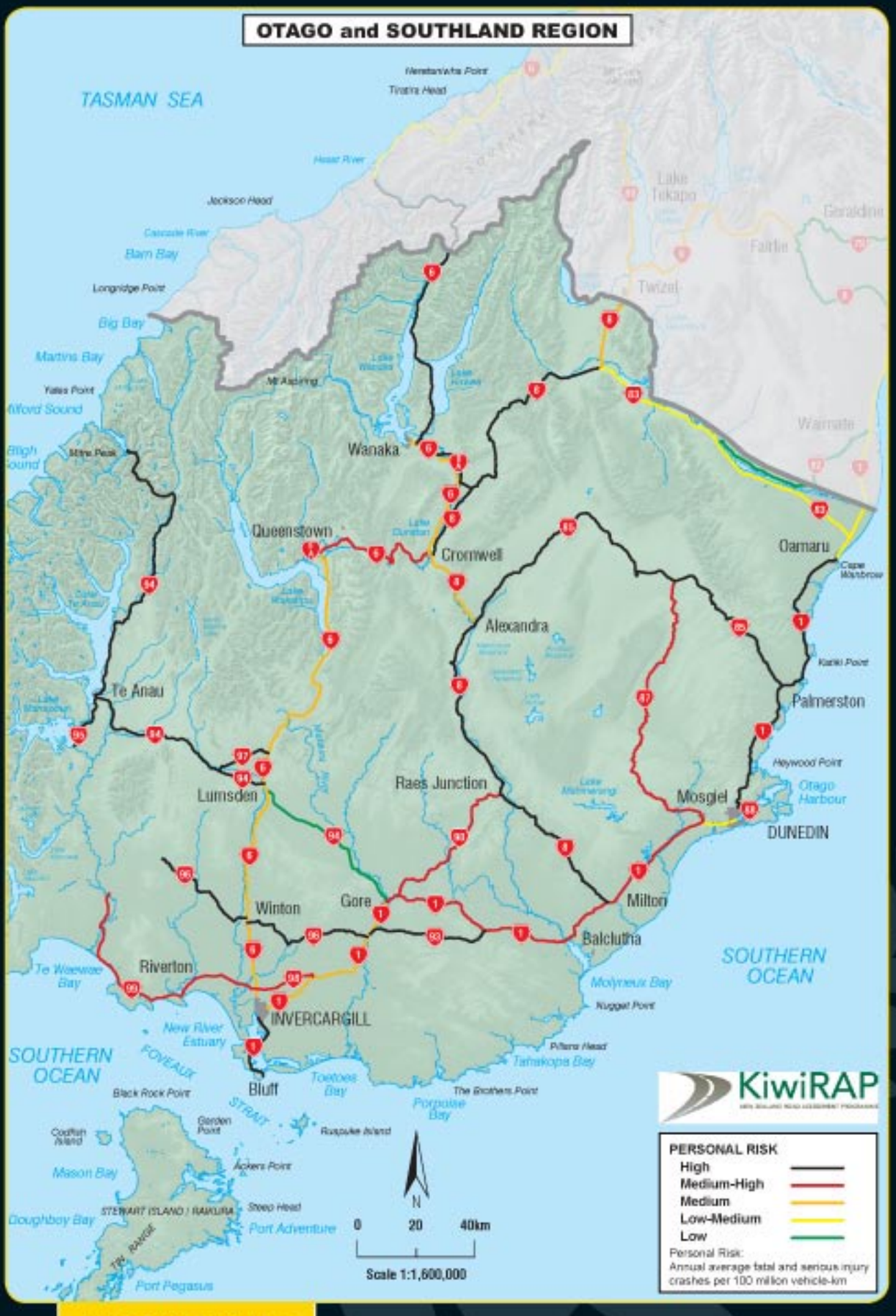
* Percentages may not add to 100% due to rounding

Link	Length (km)	Serious Injury Crashes 2002 to 2006	Fatal Crashes 2002 to 2006	Collective Risk Annual average fatal and serious injury crashes per km	Collective Risk Band	Personal Risk Annual average fatal and serious injury crashes per 100 million vehicle-km	Personal Risk Band
SH 1 from Dunedin to Mosgiel (SH 87)	19.6	16	4	0.2	High	4.3	Low-medium
SH 1 from Gore to Invercargill	63.3	20	8	0.1	Medium	6.3	Medium
SH 1 from Invercargill to Bluff	27.1	9	4	0.11	Medium-high	11.9	High
SH 1 from Milton to Gore	92.7	28	3	0.07	Medium	7.2	Medium-high
SH 1 from Mosgiel to Milton	44.7	31	5	0.17	Medium-high	7.1	Medium-high
SH 1 from Oamaru to Dunedin	108.9	73	7	0.16	Medium-high	9.3	High
SH 1 from Timaru to Oamaru*	93.2	27	6	0.09	Medium	4.9	Low-medium
SH 6 SH 8B and SH 8 from Wanaka to Alexandra	85.7	21	2	0.06	Low-medium	5.5	Medium
SH 6 from Cromwell to Queenstown	52.8	29	2	0.12	Medium-high	7.7	Medium-high
SH 6 from Haast to Wanaka*	137.8	17	3	0.03	Low	10	High
SH 6 from Lumsden to Invercargill	74.6	18	3	0.06	Low-medium	6.1	Medium
SH 6 from Queenstown to Lumsden	98.9	20	3	0.04	Low-medium	5.9	Medium
SH 8 from Alexandra to Milton	131	56	6	0.1	Medium	13.9	High
SH 8 from Alexandra to Palmerston	164.9	18	1	0.02	Low	10	High
SH 8 from Fairlie to Omarama*	129.7	16	4	0.03	Low	5.6	Medium
SH 8 from Omarama to Cromwell and SH 8A	128	30	1	0.05	Low-medium	11	High
SH 83 from Omarama to SH 1*	109.2	5	3	0.02	Low	4.2	Low-medium
SH 87 from Kyeburn to Mosgiel	114.1	9	1	0.02	Low	7	Medium-high
SH 90 from Rays Junction to Gore	59.3	8	2	0.03	Low	8.7	Medium-high
SH 93 from Clinton to Mataura	43.1	9	0	0.04	Low-medium	9.7	High
SH 94 from Gore to Lumsden	61.4	3	0	0.01	Low	2.8	Low
SH 94 from Te Anau to Milford	118.9	25	0	0.04	Low-medium	18.3	High
SH 94, 95, 97 from Lumsden to Manapouri	113.9	21	1	0.04	Low-medium	9.7	High
SH 96 from Mataura to Ohai	89.6	20	2	0.05	Low-medium	13.4	High
SH 98 and SH 99 from Dacre (SH 1) to Clifden	114	18	3	0.04	Low-medium	8.4	Medium-high

* These links cross map boundaries, so will appear in more than one regional list



COLLECTIVE RISK MAP



PERSONAL RISK MAP

NOTES