

WHAT IS KIWIRAP?

KiwiRAP analyses the road safety ratings of New Zealand's (80+km/h) rural state highway network.

KiwiRAP is part of an international family of Road Assessment Programmes (RAP) under the umbrella of the International Road Assessment Programme (iRAP). iRAP now works in partnership with government and non-government organisations in 70 countries. From its findings, iRAP recommends design improvements that need to be implemented in order to save lives and reduce the number of serious injuries on the world's roads.

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 driver and rider behaviour

HOW DOES A ROAD ASSESSMENT PROGRAMME WORK?

KiwiRAP consists of three 'protocols':

- **Risk Mapping** - uses historical traffic and crash data to produce colour-coded maps illustrating the relative level of 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 seriously injured; and to determine if countermeasures have been effective
- **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 'built-in' to the road (the higher the star, the better the road).

The first KiwiRAP Risk Maps were produced in 2008, followed by Star Ratings in 2010. This brochure shows results for Risk Mapping and Performance Tracking, comparing crash data for 2007-2011 to that from 2002-2006.

PERFORMANCE TRACKING

Performance tracking is the comparison of crash rates over time to establish whether fewer - or more - people are being killed or seriously injured on various road sections; and to determine how effective any countermeasures have been.

Performance tracking in this report compares 2007-2011 data to 2002-2006 data and is New Zealand's first opportunity to track the safety performance of the state highway network using KiwiRAP methods.

For the purpose of comparing the level of risk of crashes between different parts of the network, KiwiRAP has broken the 10,849km of the assessed state highway network into 168 road sections (known as 'links').

The same links that were developed and used for the first Risk Maps (released in 2008) have been used, where possible, in these results.

2012 RISK MAPS

For the purposes of displaying the safety risk of the state highway network, KiwiRAP looks at two different measures of risk: Collective Risk 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 2007-2011.

The roads highlighted as being of higher risk than others are likely to have specific reasons why. The road, the vehicle, the speed and the driver/rider each contribute to risk.

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.

HOW SAFE ARE OUR ROADS?

Tracking the safety performance of New Zealand's state highway network

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.

Personal Risk

Personal Risk is a measure of the risk to each individual using the state highway being assessed. Unlike Collective Risk, Personal Risk takes into account the traffic volumes on each section of state highway.

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	Green
Low-medium	$0.04 \leq 0.069$	$4 \leq 4.9$	Yellow
Medium	$0.07 \leq 0.10$	$5 \leq 6.9$	Orange
Medium-high	$0.11 \leq 0.189$	$7 \leq 8.9$	Red
High	$0.19+$	$9+$	Black

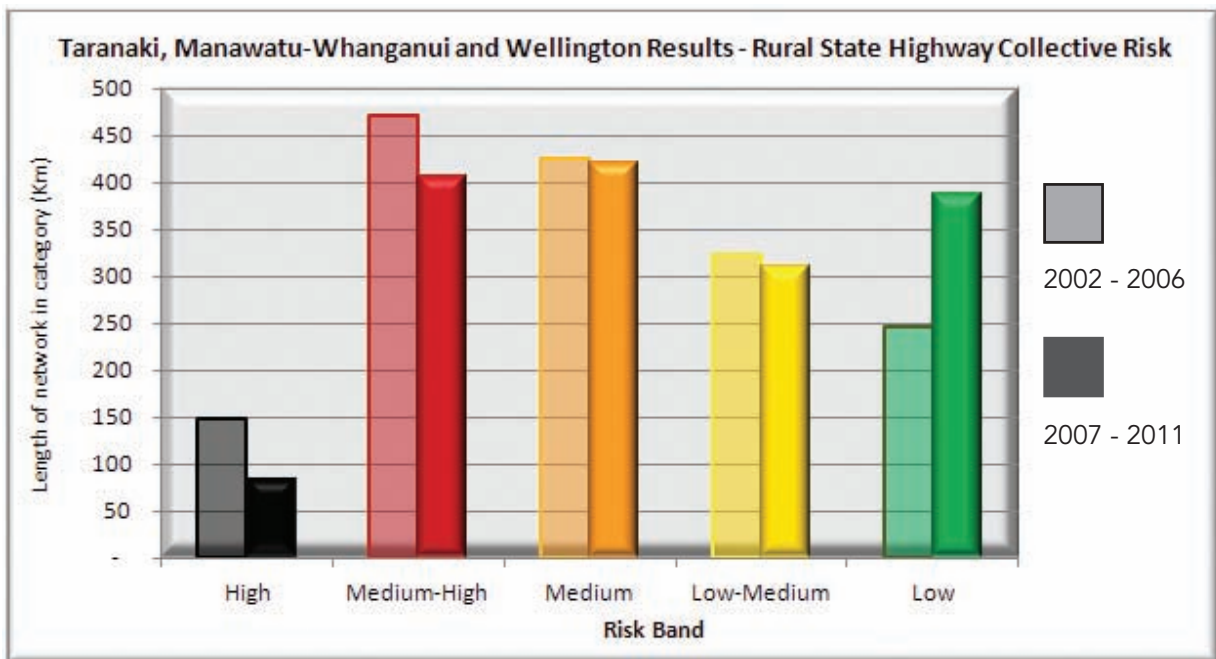
The risk thresholds for the bands have remained the same in order for comparisons to be made between the 2008 Risk Maps (covering crashes in the 2002-2006 period) and the Risk Maps in this report for the 2007-2011 period.

PERFORMANCE TRACKING FOR TARANAKI, MANAWATU-WHANGANUI AND WELLINGTON REGION

Collective Risk

The percentage of state highway in the Taranaki, Manawatu-Whanganui and Wellington region in the high collective risk band has decreased from 9% to 5% over the two time periods. The percentage of the network in the medium-high and low-medium collective risk bands has also decreased. The low collective risk band has increased from 15% to 24% of the network.

Changes in Collective Risk in the Taranaki, Manawatu-Whanganui and Wellington Region (comparing 2002-2006 data with 2007-2011)



HOW SAFE ARE OUR ROADS?

Tracking the safety performance of New Zealand's state highway network

KiwiRAP is a road safety partnership between the NZ Automobile Association, the NZ Transport Agency, the Ministry of Transport, ACC and NZ Police.

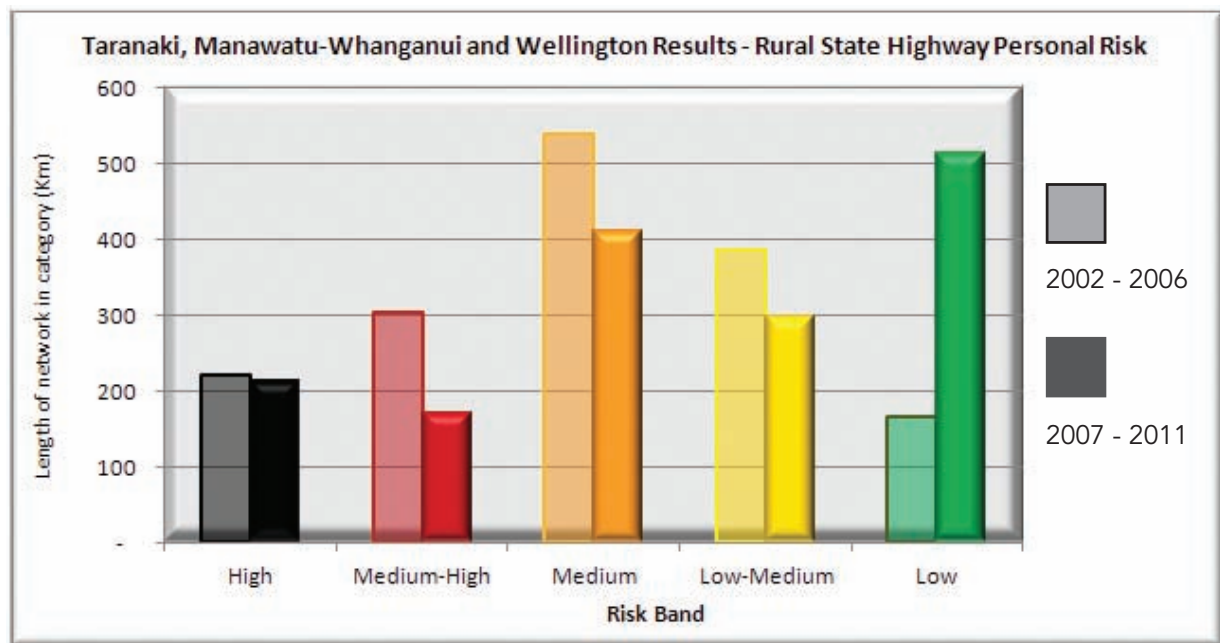
Period		High	Medium-High	Medium	Low-Medium	Low	Total
2002-2006	Percentage	9%	29%	26%	20%	15%	100%
	Length (km)	149	472	426	324	245	1,616
2007-2011	Percentage	5%	25%	26%	19%	24%	100%
	Length (km)	83	406	420	310	388	1,607

Note: percentages may not add to 100% due to rounding

Personal Risk

The percentage of state highway network in the high, medium-high, medium and low-medium personal risk bands all decreased in the Taranaki, Manawatu-Whanganui and Wellington region whereas the percentage of network in the low risk band increased from 10% to 32% between the 2002-2006 and 2007-2011 time periods.

Changes in Personal Risk in the Taranaki, Manawatu-Whanganui and Wellington Region (comparing 2002-2006 data with 2007-2011)



Period		High	Medium-High	Medium	Low-Medium	Low	Total
2002-2006	Percentage	14%	19%	33%	24%	10%	100%
	Length (km)	222	304	537	385	167	1,615
2007-2011	Percentage	13%	11%	26%	19%	32%	100%
	Length (km)	212	171	412	298	515	1,607

Note: percentages may not add to 100% due to rounding

HOW SAFE ARE OUR ROADS?

Tracking the safety performance of New Zealand's state highway network

KiwiRAP is a road safety partnership between the NZ Automobile Association, the NZ Transport Agency, the Ministry of Transport, ACC and NZ Police.

The table below details how the risk categories of the links in the Taranaki, Manawatu-Whanganui and Wellington region have changed between the two time periods.

CHANGES IN COLLECTIVE RISK		LINK	CHANGES IN PERSONAL RISK	
2002-2006 DATA	2007-2011 DATA		2002-2006 DATA	2007-2011 DATA
High	High	SH 1 from Paraparaumu to Levin	Medium	Low
Medium-High	Medium	SH 1 from Sanson to Levin	Low-Medium	Low
Low-Medium	Medium	SH 1 from Turangi to Waiouru*	Low-Medium	Medium
Medium	Medium	SH 1 from Waiouru to Bulls	Low-Medium	Low
Medium-High	Medium-High	SH 1 from Wellington to Paremata Roundabout	Low	Low
Medium-High	Medium-High	SH 2 from Featherston to Masterton	Medium	Low
Medium-High	High	SH 2 from Featherston to Upper Hutt	Medium-High	High
Medium-High	Medium	SH 2 from Takapau to Woodville*	Medium-High	Medium
High	Medium-High	SH 2 from Wellington to Upper Hutt	Low	Low
Medium	Medium	SH 2 from Woodville to Masterton	Medium	Medium
Medium-High	Medium-High	SH 3 and 3A from New Plymouth and Waitara to Hawera	Low-Medium	Low-Medium
Medium-High	Medium-High	SH 3 and SH 1 from Whanganui to Palmerston North	Medium	Low
Medium	Low-Medium	SH 3 from Hawera to Whanganui	Medium	Low-Medium
Medium-High	Medium-High	SH 3 from Palmerston North to Woodville	Low-Medium	Medium
Medium	Medium	SH 3 from Te Kuiti to New Plymouth*	Medium-High	Medium
Low-Medium	Low-Medium	SH 4 from Eight Mile Junction (Sth of Te Kuiti) to Taumarunui*	Medium-High	Medium
Low-Medium	Low	SH 4 from Raetihi to Whanganui	High	Medium
Medium	Low-Medium	SH 4 from Taumarunui to Raetihi	High	Medium-High
Low	Low-Medium	SH 41 from Taumarunui to Turangi*	Medium-High	High
Low	Low	SH 43 from Stratford to Taumarunui	Medium	High
Low-Medium	Low-Medium	SH 45 from New Plymouth to Hawera	Low-Medium	Low-Medium
Low	Low	SH 46 SH 47 SH 48 from National Park to Turangi*	Low	Medium-High
Low	Low	SH 49 from SH 4 to Waiouru	Medium	Low
Low-Medium	Low	SH 53 from Featherston to Martinborough	Medium-High	Low-Medium
High	Medium-High	SH 54 from Feilding to SH 3 Palmerston North	Medium-High	Medium
Low-Medium	Low	SH 54 from Vinegar Hill (SH 1) to Feilding	High	Low
Medium-High	Medium-High	SH 56 from Makerua (SH 57) to Palmerston North	Medium	Medium
Medium-High	Medium-High	SH 57 from Levin to Ashhurst	Medium-High	Medium-High
High	High	SH 58 from Porirua to SH 2 Upper Hutt	Medium	Low-Medium

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

Boxes highlighted green depict a decrease in risk between the 2002-2006 and 2007-2011 time periods; red depicts an increase in risk; no colour is no change in risk.

Note: (Table below)

¹The link length includes urban sections. However, the urban lengths and urban crashes have been excluded from the crash risk analysis.

²These links cross map boundaries, so will appear in more than one regional list.

³The lengths of these links differ to those published in the 2008 Risk Map report due to the reassessment of where the urban boundary limits were set.

Symbol – : no data.

HOW SAFE ARE OUR ROADS?

Tracking the safety performance of New Zealand's state highway network

KiwiRAP is a road safety partnership between the NZ Automobile Association, the NZ Transport Agency, the Ministry of Transport, ACC and NZ Police.

2012 RISK MAPS FOR TARANAKI, MANAWATU-WHANGANUI AND WELLINGTON REGION

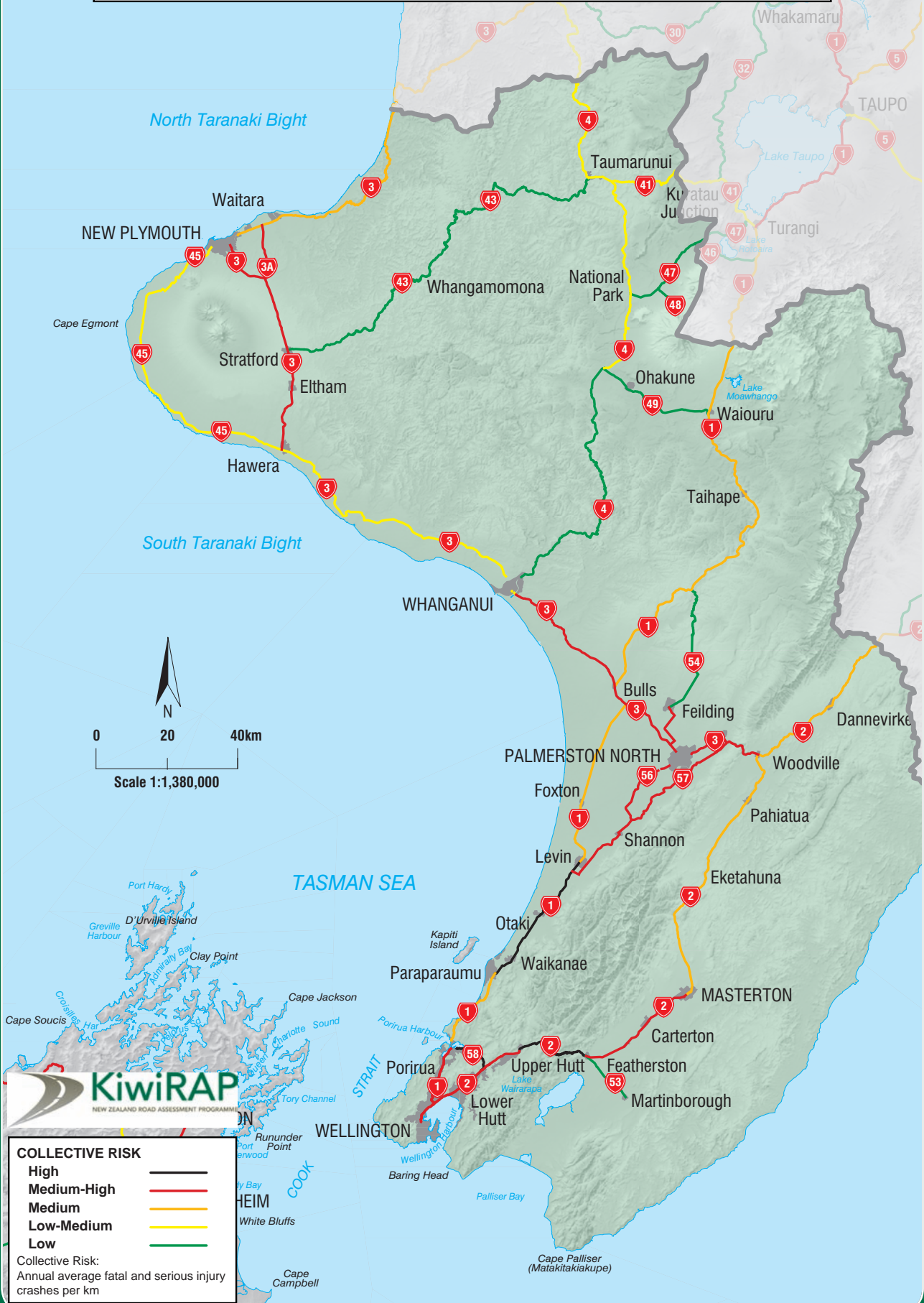
Link	Length ⁽¹⁾ (km)	Serious Injury Crashes 2007 to 2011	Fatal Crashes 2007 to 2011	Collective Risk Annual average fatal and serious injury crashes per km	Collective Risk Band	Personal Risk Annual average fatal and serious injury crashes per 100 million vehicle-km	Personal Risk Band
SH 1 from Paraparaumu to Levin	42.0	31	9	0.23	High	3.7	Low
SH 1 from Pukerua Bay to Paraparaumu	33.0	11	1	0.08	Medium	1.3	Low
SH 1 from Sanson to Levin	49.6	18	3	0.10	Medium	4.0	Low
SH 1 from Turangi to Waiouru ⁽²⁾	61.6	17	9	0.09	Medium	6.8	Medium
SH 1 from Waiouru to Bulls	109.7	32	6	0.07	Medium	4.0	Low
SH 1 from Wellington to Paremata Roundabout	48.5	32	4	0.15	Medium-High	1.5	Low
SH 2 from Featherston to Masterton	35.0	10	2	0.11	Medium-High	3.6	Low
SH 2 from Featherston to Upper Hutt	27.5	32	2	0.27	High	12.9	High
SH 2 from Takapau to Woodville ⁽²⁾	58.9	20	6	0.10	Medium	5.3	Medium
SH 2 from Wellington to Upper Hutt	49.3	34	4	0.16	Medium-High	1.3	Low
SH 2 from Woodville to Masterton	81.6	22	7	0.08	Medium	6.7	Medium
SH 3 and 3A from New Plymouth and Waitara to Hawera	83.0	32	11	0.13	Medium-High	4.8	Low-Medium
SH 3 and SH 1N from Whanganui to Palmerston North	68.4	23	11	0.11	Medium-High	3.3	Low
SH 3 from Hawera to Whanganui ⁽³⁾	85.2	16	6	0.06	Low-Medium	4.0	Low-Medium
SH 3 from Palmerston North to Woodville	23.6	15	3	0.16	Medium-High	5.7	Medium
SH 3 from Te Kuiti to New Plymouth ⁽²⁾	145.8	37	15	0.07	Medium	5.9	Medium
SH 4 from 8 Mile Junction (Sth of Te Kuiti) to Taumarunui ⁽²⁾	69.6	13	2	0.04	Low-Medium	5.5	Medium
SH 4 from Raetihi to Whanganui ⁽³⁾	91.7	9	3	0.03	Low	6.6	Medium
SH 4 from Taumarunui to Raetihi	68.9	17	4	0.06	Low-Medium	8.9	Medium-High
SH 41 from Taumarunui to Turangi ⁽²⁾	58.4	10	5	0.05	Low-Medium	13.0	High
SH 43 from Stratford to Taumarunui	148.4	10	5	0.02	Low	16.3	High
SH 45 from New Plymouth to Hawera	98.5	15	6	0.05	Low-Medium	4.8	Low-Medium
SH 46 SH 47 SH 48 from National Park to Turangi ⁽²⁾	72.4	8	2	0.03	Low	7.9	Medium-High
SH 49 from SH 4 to Waiouru	36.1	2	-	0.01	Low	1.6	Low
SH 53 from Featherston to Martinborough	17.7	2	-	0.03	Low	4.4	Low-Medium
SH 54 from Feilding to SH 3 Palmerston North	13.5	8	-	0.13	Medium-High	5.5	Medium
SH 54 from Vinegar Hill (SH 1N) to Feilding	43.0	3	-	0.02	Low	2.9	Low
SH 56 from Makerua (SH 57) to Palmerston North	21.3	9	5	0.13	Medium-High	6.5	Medium
SH 57 from Levin to Ashhurst	63.5	28	12	0.14	Medium-High	7.5	Medium-High
SH 58 from Porirua to SH 2 Upper Hutt	13.3	12	2	0.21	High	4.4	Low-Medium

HOW SAFE ARE OUR ROADS?

Tracking the safety performance of New Zealand's state highway network

KiwiRAP is a road safety partnership between the NZ Automobile Association, the NZ Transport Agency, the Ministry of Transport, ACC and NZ Police.

TARANAKI, MANAWATU-WHANGANUI and WELLINGTON REGION



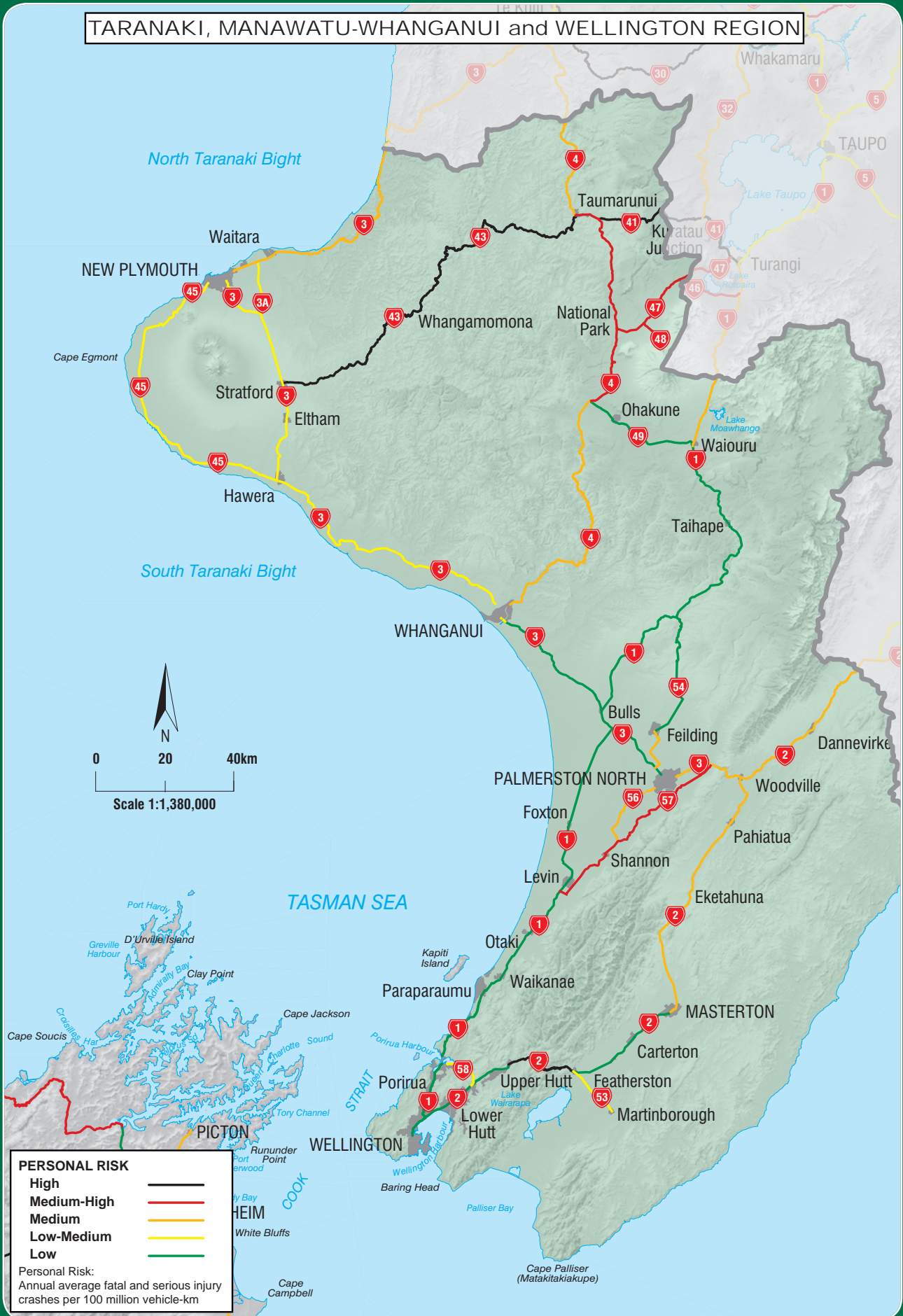
COLLECTIVE RISK MAP

HOW SAFE ARE OUR ROADS?

Tracking the safety performance of New Zealand's state highway network

KiwiRAP is a road safety partnership between the NZ Automobile Association, the NZ Transport Agency, the Ministry of Transport, ACC and NZ Police.

TARANAKI, MANAWATU-WHANGANUI and WELLINGTON REGION



PERSONAL RISK MAP

HOW SAFE ARE OUR ROADS?

Tracking the safety performance of New Zealand's state highway network

KiwiRAP is a road safety partnership between the NZ Automobile Association, the NZ Transport Agency, the Ministry of Transport, ACC and NZ Police.