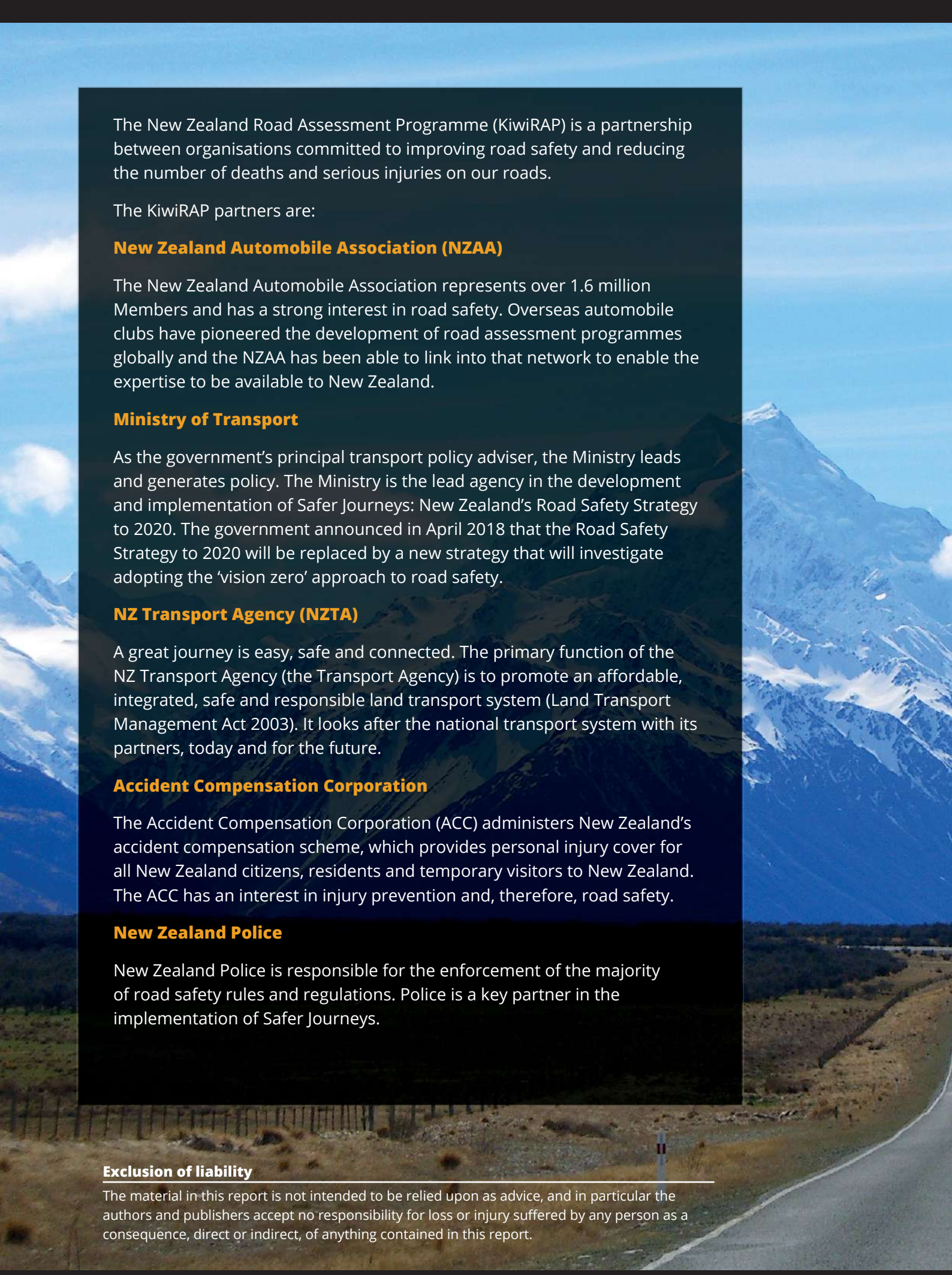
KiwiRAP
NEW ZEALAND ROAD ASSESSMENT PROGRAMME

Highway Safety Ratings

2012-2016

Tracking the safety performance of New Zealand's State Highway network

Published 2018



The New Zealand Road Assessment Programme (KiwiRAP) is a partnership between organisations committed to improving road safety and reducing the number of deaths and serious injuries on our roads.

The KiwiRAP partners are:

New Zealand Automobile Association (NZAA)

The New Zealand Automobile Association represents over 1.6 million Members and has a strong interest in road safety. Overseas automobile clubs have pioneered the development of road assessment programmes globally and the NZAA has been able to link into that network to enable the expertise to be available to New Zealand.

Ministry of Transport

As the government's principal transport policy adviser, the Ministry leads and generates policy. The Ministry is the lead agency in the development and implementation of Safer Journeys: New Zealand's Road Safety Strategy to 2020. The government announced in April 2018 that the Road Safety Strategy to 2020 will be replaced by a new strategy that will investigate adopting the 'vision zero' approach to road safety.

NZ Transport Agency (NZTA)

A great journey is easy, safe and connected. The primary function of the NZ Transport Agency (the Transport Agency) is to promote an affordable, integrated, safe and responsible land transport system (Land Transport Management Act 2003). It looks after the national transport system with its partners, today and for the future.

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. Police is a key partner in the implementation of Safer Journeys.

Contents

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).

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

Similar programmes have been implemented in Europe (EuroRAP), Australia (AusRAP), the United States of America (usRAP), South Africa, Malaysia and elsewhere.

iRAP's vision is a World Free of High Risk Roads, and the programme plays a leading role in the United Nations Road Safety Collaboration. The RAP is a sister programme to ANCAP, the Australasian New Car Assessment Programme that assigns Star Ratings to vehicles based upon the protection they provide to occupants in the event of a crash.

A registered charity, iRAP now works in partnership with government and non-government organisations in 80 countries to investigate and risk rate road networks. From its findings, iRAP recommends design improvements that need to be implemented in order to ultimately save lives and reduce the number of serious injuries on the world's roads.

New Zealand context

This is the third KiwiRAP report that has analysed the number of fatal and serious crashes on most of the rural state highways in New Zealand.

Each report has used crash data over a five-year period to analyse the risks on different sections of highway.

The graph below (Figure 1) shows how the number of fatal and serious injury crashes on New Zealand's state highways has reduced since the first KiwiRAP period of 2002-2006.

While the trend over the 15 years in total has been positive, the results in the latest period have been more varied and this needs to be kept in mind when reading this report.

The five years from 2012-2016 included a record low number of fatal and serious crashes in 2013 but since then crash numbers on the state highways (as well as the amount of kilometres being travelled on them) have increased. Data for 2017 is not included in this report but the upward trend in crashes continued again that year, showing a concerning change from the reductions that were achieved earlier in the decade.

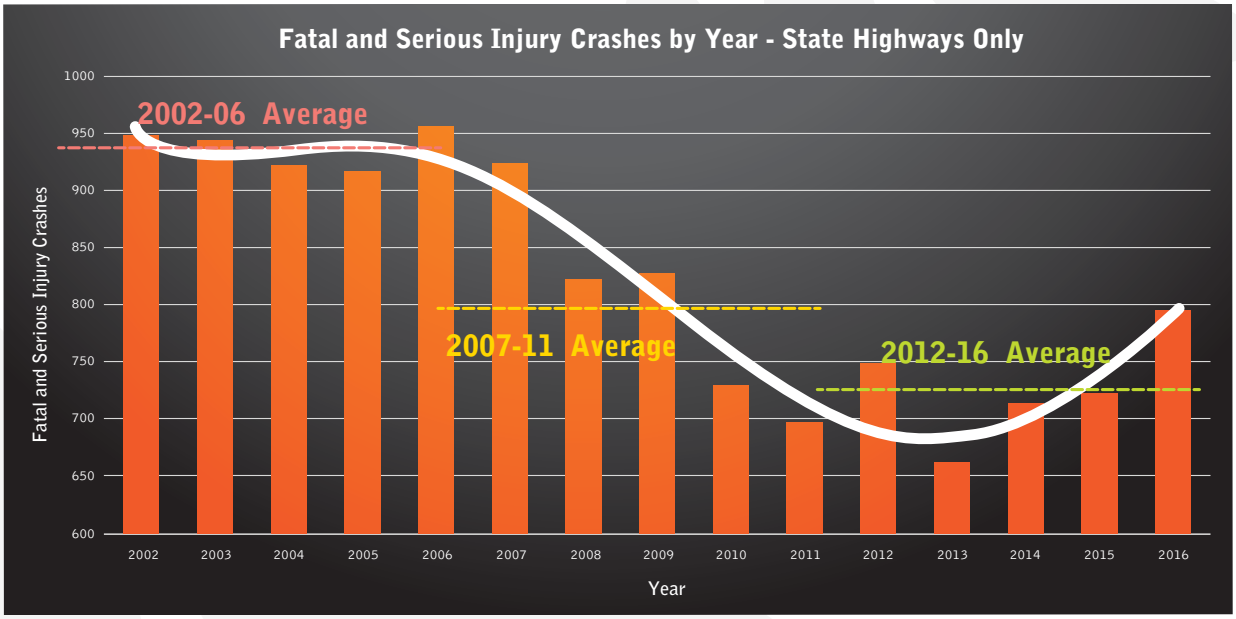


Figure 1: State Highway Fatal and Serious Crashes by Year

How does a Road Assessment Programme work?

Road Assessment Programmes internationally consist 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 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).

This Report

- In 2008 the first KiwiRAP Risk Maps were published and used crash data from 2002-2006.
- In 2010 the first KiwiRAP Star Ratings were published.
- In 2012 the first KiwiRAP performance tracking report was published. This updated the risk maps with data from 2007-2011 and compared it to that from 2002-2006.
- This report provides updated Risk Maps using crash data from 2012-2016 and also provides comparisons between all three time periods that have been measured.

All reports are available at www.kiwirap.org.nz

Does KiwiRAP report on the entire State Highway network?

KiwiRAP reports on state highway links that are typically outside urban areas between major town centres, beginning and ending at the major urban area speed limit changes – that is, rural state highway links that have speed limits of 80km/h or more. The length of state highway shown is the total length between the major town centre boundaries. Therefore, each includes the length of road through small urban areas/townships along that length. However, these small urban lengths and the urban crashes thereon have been excluded from the analysis to calculate the rural road risk ratings.

The New Zealand state highway network consists of approximately 11,600 kilometres of rural and urban roads, and KiwiRAP reports on approximately 11,000km of those. This equates to about 12% of all New Zealand Roads, but accounts for about half of the vehicle kilometres travelled every year and almost half of all fatal crashes. Approximately 30% of all fatal and serious injury crashes in 2016 occurred on the parts of the state highway network that KiwiRAP reports on.

Performance Tracking

What is 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. It can help determine how effective any countermeasures have been.

Performance tracking in this report compares 2012-2016 Risk Map data to 2007-2011 Risk Map data. In addition, it also references the first Risk Map period of 2002-2006, to show the full picture of Risk Mapping and Performance Tracking to date.

The report is split up into the following sections:

- **National performance tracking summary**
- **Road links with significant changes**
  - » **Most improved road links**
  - » **Road links with a significant increase in fatal and serious crashes**
  - » **Persistently high risk road links**
- **Regional results**
- **Maps**
- **Table of all road links**

See Appendix for technical information on the road links that have changed between the reporting periods.

National Performance Tracking summary

Collective Risk

Collective Risk is a measure of the total number of fatal and serious injury crashes per kilometre over a section of road. Collective Risk can also be described as the crash density.

Collective Risk is typically highest on higher volume roads. It is often of greatest interest to road controlling authorities and NZ Police as it is where the greater number of crash reductions can be achieved through infrastructure improvement and enforcement. Refer to the Appendix for more details.

Figure 2 below shows how the level of Collective Risk has changed over time for the rural state highway network.

Over the three time periods (2002-2006, 2007-2011 and 2012-2016), the proportion of the highway network with low and low-medium levels of collective crash risk has progressively increased while the proportion of the network in the high, medium-high and medium risk bands has progressively decreased. Overall, the length of highway in the high Collective Risk band has reduced by 549km (-68%) since 2002-2006 while the length of highway in the low Collective Risk band has increased by 1718km (+54%). For the 2012-2016 period, nearly three quarters (74%) of assessed state highways were in the low-medium to low Collective Risk band.

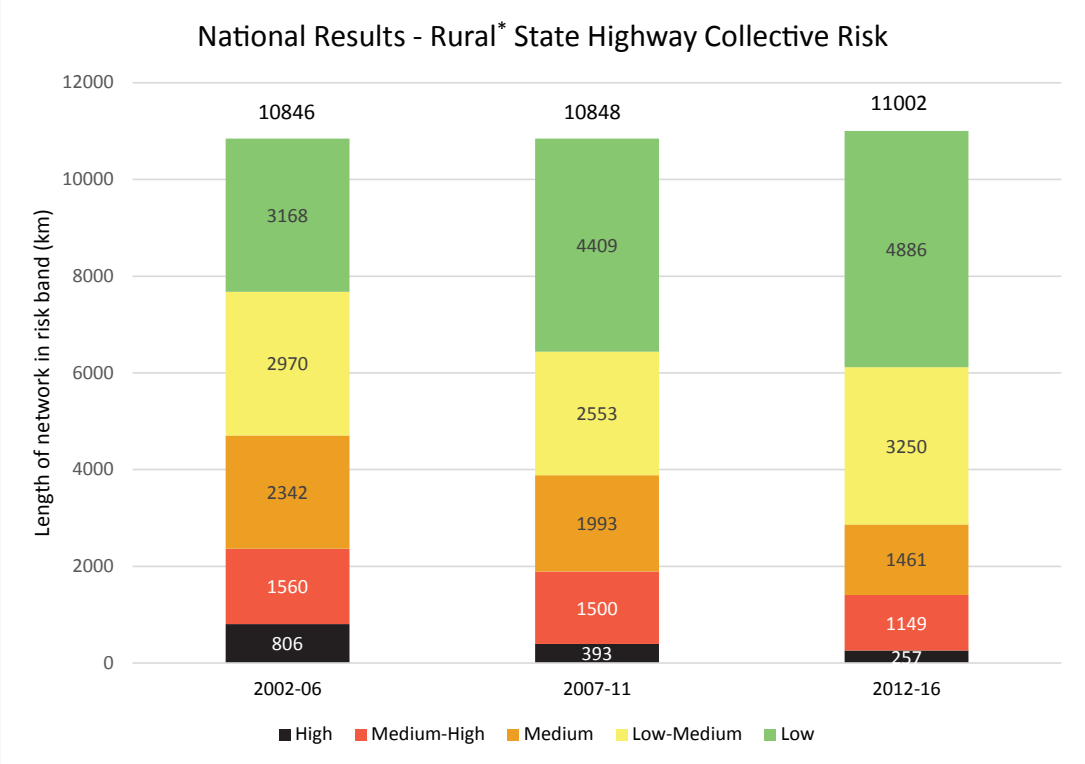


Figure 2: Changes in Collective Risk over New Zealand's rural state highway network (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more.
NB: Individual bars may not sum perfectly due to rounding

Personal Risk

Personal Risk is a measure of the danger 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.

Personal Risk is often highest on lower volume, lower standard, mountainous roads. In many cases infrastructure improvements would not be cost effective and improving safety through the other safe system pillars such as safer speeds, safer vehicles and safer road use may be required. Refer to the Appendix for more details.

Figure 3 below shows how the level of Personal Risk has changed over time for the assessed state highway network.

The pattern over the three periods (2002-2006, 2007-2011 and 2012-2016) has been similar to Collective Risk, showing progressive improvement through a greater proportion of the rural state highway network in the lower Personal Risk bands and fewer in the high risk band. The length of highway in the high Personal Risk band has reduced by 1182km (-52%) since 2002-2006 while the length of highway in the low Personal Risk band has increased by 2371km (+194%). For 2012-2016, nearly half (48%) of the assessed state highways were in the low-medium to low Personal Risk band.

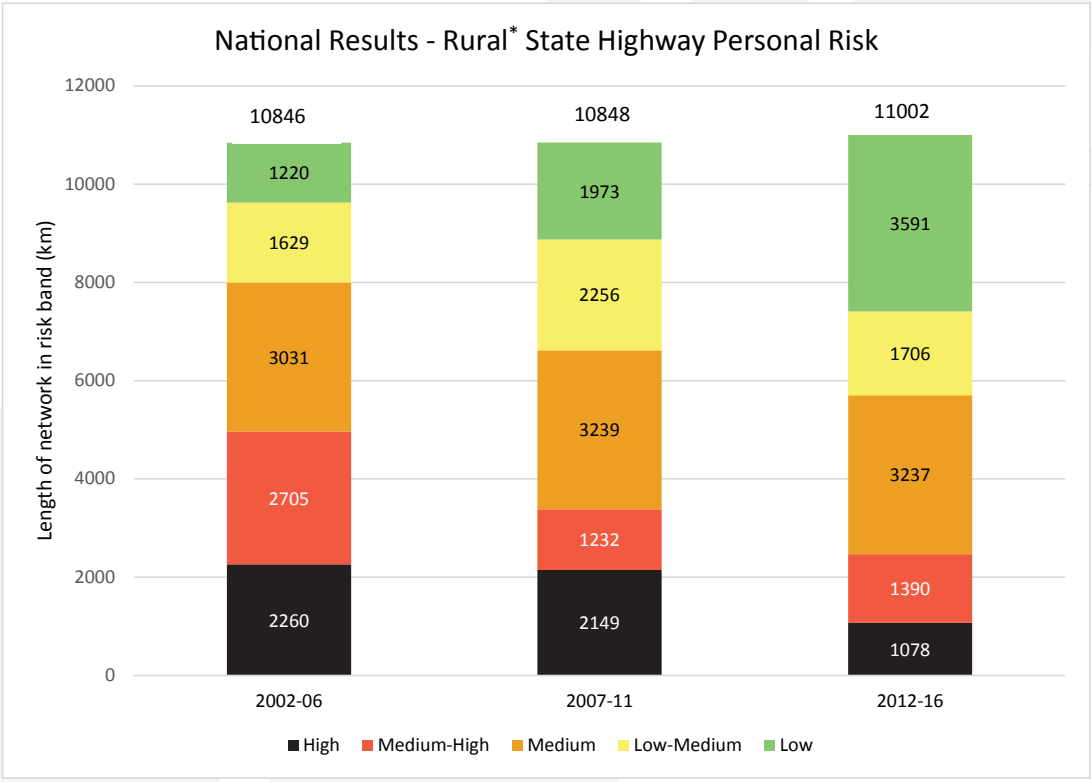


Figure 3: Changes in Personal Risk over New Zealand's rural state highway network (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more.
NB: Individual bars may not sum perfectly due to rounding

Road links with significant changes

Between the last two time periods (2007-2011 and 2012-2016) there are a number of road links that have had a significant change in the number of fatal and serious crashes that have occurred on them – either a significant reduction in crashes, or a significant increase.

Most improved road links

The 'most improved' sections of state highway are those where there has been a significant reduction in fatal and serious crashes over time. That is, those with a statistically significant reduction in the number of fatal and serious injury crashes at the 95% confidence level.

Many other highways also had reductions in fatal and serious crashes but the reduction in crash numbers did not meet the 95% confidence level to be included.

The most improved links are shown in Table 1.

Table 1: Most improved road links

Site Name	Region	07-11 Crashes					12-16 Crashes					Difference in F+S
		Fatal	Serious	F+S	Collective Risk Band	Personal Risk Band	Fatal	Serious	F+S	Collective Risk Band	Personal Risk Band	
SH 1 from Kaikoura to Waipara	Canterbury	5	46	51	Medium	Medium-High	7	23	30	Low-Medium	Low-Medium	-21
SH 77 from Ashburton to Darfield	Canterbury	6	21	27	Low-Medium	High	1	5	6	Low	Low	-21
SH 2 from Takapau to Hastings	Hawke's Bay/ Manawatu-Whanganui	10	29	39	Medium-High	Medium	6	13	19	Low-Medium	Low	-20
SH 2 from Featherston to Upper Hutt	Wellington	2	32	34	High	High	3	13	16	Medium-High	Medium	-18
SH 2 from Takapau to Woodville	Manawatu-Whanganui	6	20	26	Medium	Medium	1	10	11	Low-Medium	Low	-15
SH 1 from Timaru to Oamaru	Canterbury/Otago	10	20	30	Medium	Low-Medium	6	9	15	Low-Medium	Low	-15
SH 1 from Warkworth to Wellsford	Auckland	9	17	26	High	Medium-High	2	11	13	Medium-High	Low-Medium	-13
SH 6 from Queenstown to Lumsden	Otago/Southland	3	19	22	Low-Medium	Low-Medium	2	7	9	Low	Low	-13
SH 5 from Taupo to Tarawera	Waikato/Bay of Plenty/ Hawke's Bay	6	14	20	Low-Medium	Low-Medium	1	7	8	Low	Low	-12
SH 1 from Picton to Blenheim	Marlborough	4	13	17	Medium-High	Medium	0	5	5	Low-Medium	Low	-12
SH 1 from Piarere to Putaruru	Waikato	6	11	17	High	Medium	4	1	5	Low-Medium	Low	-12
SH 8 from Timaru to Fairlie	Canterbury	4	7	11	Low-Medium	Medium	1	1	2	Low	Low	-9
SH 1 from Huntly to Hamilton*	Waikato	11	30	41	High	Low-Medium	1*	7*	8*	Low-Medium	Low	-33*

*The SH1 from Huntly to Hamilton link contains only 3 years worth of crash data for the 2012-16 time period, following the completion of the Ngaruawahia and Te Rapa sections of the Waikato Expressway. While it is not directly comparable with the other links in the table, it has been included here to highlight the reduction in crashes that have occurred following the completion of the Waikato Expressway sections.

Road links with a significant increase in fatal and serious crashes

There are several road links where there has been a significant increase in fatal and serious crashes when comparing 2007-2011 and 2012-2016. Table 2 shows those road links with a significant increase in fatal and serious injury crashes at a 90% confidence level.

The confidence interval threshold is 90% (compared to the 95% threshold used for the most improved links) to ensure consistency with the methodology in the 2007-2011 KiwiRAP Performance Tracking report. It is noted that some of these lengths are identified based on relatively low crash numbers.

Table 2: Links with a significant increase in fatal and serious crashes

Site Name	Region	07-11 Crashes					12-16 Crashes					Difference in F+S
		Fatal	Serious	F+S	Collective Risk Band	Personal Risk Band	Fatal	Serious	F+S	Collective Risk Band	Personal Risk Band	
SH 3 from Te Kuiti to New Plymouth	Taranaki / Waikato	15	37	52	Medium	Medium	11	60	71	Medium	Medium-High	+19
SH 20 and SH 20A and SH 20B	Auckland	3	11	14	Medium	Low	2	30	32	Medium-High	Low	+18
SH 2 from SH 33 to Matata	Bay of Plenty	1	2	3	Low	Low	5	11	16	Medium	Low-Medium	+13
SH 73 from Christchurch to Darfield	Canterbury	1	5	6	Low-Medium	Low	5	11	16	Medium	Low	+10
SH 6 from Cromwell to Queenstown	Otago	2	9	11	Low-Medium	Low	1	20	21	Medium	Low-Medium	+10
SH 25 from Mangatarata (SH 2) to Thames	Waikato	0	7	7	Low-Medium	Low	4	11	15	Medium-High	Medium	+8

Commentary on each link is below:

SH 3 from Te Kuiti to New Plymouth

Fatal and serious crash numbers increased from 52 to 71. There was a small increase (about 5%) in traffic volume in the past five years. Of the crashes, 17 (24%) involved trucks, 12 (17%) involved motorcycles and 37 (52%) occurred on curves. There are several safety improvement programmes planned for this corridor including the Mt Messenger Bypass, Awakino Tunnel Bypass, safety and resilience improvements between Awakino Gorge and Mt Messenger.

SH 20 and SH 20A and SH 20B

Fatal and serious crash numbers increased from 14 to 32. Traffic volumes have increased at least 30% between the two periods, and this will have contributed to the increase in crashes. With the opening of the Waterview Tunnel to the north of this corridor, traffic volumes are likely to continue to increase in future.

Of the crashes, nine (28%) involved trucks and 17 (53%) occurred in darkness or twilight. Two projects underway on the corridor include grade separation along SH20A and an upgrade at the Walmsley Road interchange.

SH 2 from SH 33 to Matata

Fatal and serious crash numbers increased from three to 16. All recorded fatal and serious crashes occurred on the western half of this corridor between SH33 and Otamarakau. There was a small increase in traffic volume (about 5%) in the past five years. Of the crashes, three (19%) involved motorcycles, five (31%) involved trucks and five (31%) occurred on curves.

SH 73 from Christchurch to Darfield

Fatal and serious crash numbers increased from six to 16. Traffic volumes have increased at least 10% along the corridor in recent years due to recent growth in the West Melton township

and other nearby areas. Of the crashes, 10 (63%) occurred east of West Melton, and there is a prevalence of weekday crashes.

SH 6 from Cromwell to Queenstown

Fatal and serious crash numbers increased from 11 to 21. Traffic volumes have increased at least 15% along the corridor in recent years due to recent growth in the Queenstown-Lakes and Central Otago areas. Of the crashes, 12 (57%) occurred on curves but there were few other commonalities.

SH 25 from Mangatarata (SH 2) to Thames

Fatal and serious crash numbers increased from seven to 15. This corridor is the primary route used by Auckland traffic travelling to and from the Coromandel Peninsula. There was an increase in traffic volume in the past five years of at least 10%.

Of all crashes, nine (60%) occurred in darkness (up from five between 2007-2011) and eight (53%) occurred during the weekend (up from three in 2007-2011).

Persistently high risk road links

Sites with high Collective Risk or high Personal Risk across all three time periods are categorised as persistently high risk road links and are identified in Tables 3 and 4.

Table 3: Road links with high Collective Risk across three time periods

Site Name	Region	02-06 Crashes					07-11 Crashes					12-16 Crashes				
		F	S	F+S	Collective Risk Band	Personal Risk Band	F	S	F+S	Collective Risk Band	Personal Risk Band	F	S	F+S	Collective Risk Band	Personal Risk Band
SH 2 from Katikati to Tauranga	Bay of Plenty	9	19	28	High	Low-Medium	5	27	32	High	Low-Medium	12	22	34	High	Low-Medium
SH 22 from Drury to Pukekohe	Auckland	4	17	21	High	Medium	5	7	12	High	Low	2	11	13	High	Medium
SH 1 from Paraparau-mu to Levin	Wellington	15	44	59	High	Medium	9	31	40	High	Low	8	29	37	High	Low
SH 58 from Porirua to SH 2 Upper Hutt	Wellington	5	15	20	High	Medium	2	12	14	High	Low-Medium	2	14	16	High	Medium
SH 1 from Auckland to Takanini	Auckland	14	54	68	High	Low	8	46	54	High	Low	6	44	50	High	Low

Table 4: Road links with high Personal Risk across three time periods

Site Name	Region	02-06 Crashes					07-11 Crashes					12-16 Crashes				
		F	S	F+S	Collective Risk Band	Personal Risk Band	F	S	F+S	Collective Risk Band	Personal Risk Band	F	S	F+S	Collective Risk Band	Personal Risk Band
SH 31 from Kawhia to SH 39	Waikato	1	5	6	Low	High	0	10	10	Low-Medium	High	0	4	4	Low	High
SH 37 from SH 3 to Waitomo Caves	Waikato	1	5	6	Medium-High	High	0	3	3	Medium	High	0	2	2	Low-Medium	High
SH 12 from Dargaville to Ohaeawai	Northland	8	25	33	Low-Medium	High	8	21	29	Low-Medium	High	3	31	34	Low-Medium	High
SH 7 from Hanmer Springs to Reefton	Canterbury/ West Coast	5	16	21	Low	High	3	20	23	Low	High	1	27	28	Low-Medium	High
SH 94 from Te Anau to Milford Sound	Southland	0	25	25	Low-Medium	High	3	18	21	Low	High	2	19	21	Low	High

Regional results

Where a link crosses regional boundaries, the kilometres are split between the two regions according to where the boundary lies along the link.

Northland and Auckland Region

Collective Risk

Figure 4 below shows how the level of Collective Risk has changed over time for rural state highways in the Northland and Auckland region.

In contrast to the national results, in the Northland and Auckland region there has been an increase in the length of network in the high and medium-high Collective Risk band over the most recent two time periods (comparing 2007-2011 with 2012-2016). The length of highway in the high Collective Risk band has increased by 27km (+23%) and in the high-medium Collective Risk band by 45km (+17%).

If we compare the most recent results (2012-2016) with the first risk levels (2002-2006), the trend is positive with the length of highway in the high Collective Risk band reducing by 194km (-57%) since 2002-2006 while the length of highway in the low Collective Risk band has increased by 67km (+29%). For the 2012-2016 period, approximately half of the assessed state highway length was in the low-medium to low Collective Risk band.

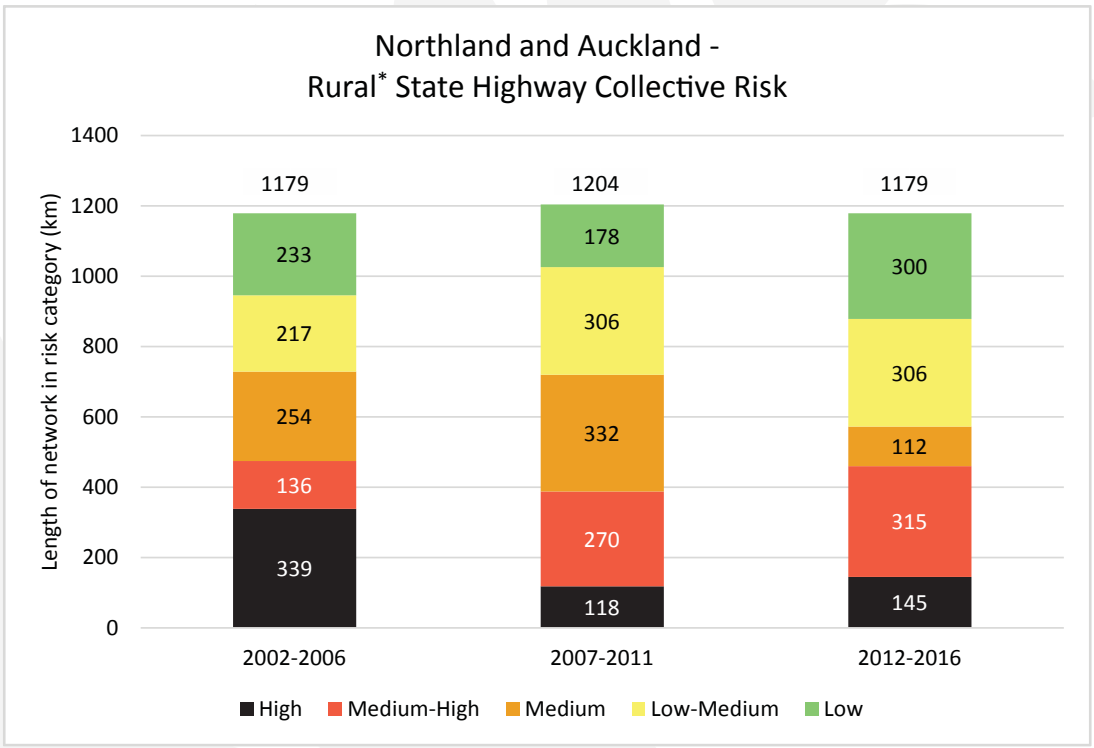


Figure 4: Changes in Collective Risk in Northland and Auckland Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Personal Risk

Figure 5 below shows how the level of Personal Risk has changed over time for rural state highways in the Northland and Auckland region.

Over the three periods (2002-2006, 2007-2011 and 2012-2016), the pattern differs slightly from Collective Risk. The length of highway in the high Personal Risk band has increased between the first two time periods (2002-2006 and 2007-2011) and then decreased between 2007-2011 and 2012-2016. Comparing where the risk levels were at the beginning of KiwiRAP with the most recent results, the length of state highway network rated as high Personal Risk has increased by 4km (+1%). The length of highway in the low Personal Risk band has followed a similar pattern ending up with an overall increase of 61km (+25%). For 2012-2016, 37% of the assessed state highway length is in the low-medium to low Personal Risk band.

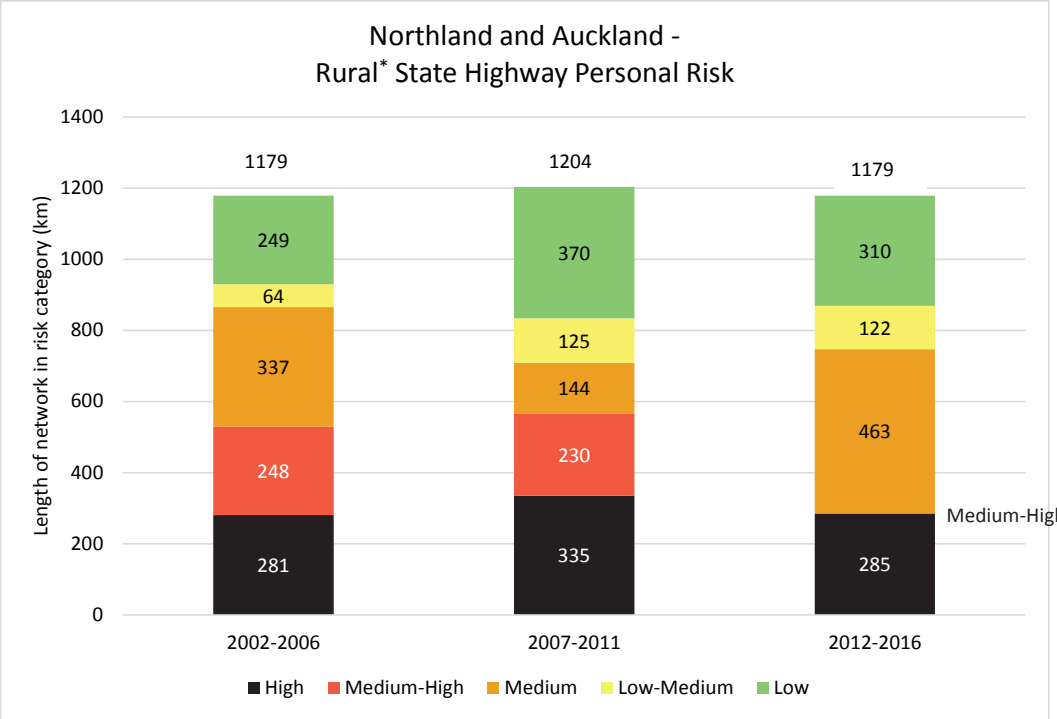


Figure 5: Changes in Personal Risk in Northland and Auckland Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Waikato and Bay of Plenty Region

Collective Risk

Figure 6 below shows how the level of Collective Risk has changed over time for rural state highways in the Waikato and Bay of Plenty region.

Over the three time periods (2002-2006, 2007-2011 and 2012-2016), Collective Risk in the Waikato and Bay of Plenty region has followed the national trend of progressive improvement. The length of highway in the high Collective Risk band has reduced by 205km (-85%) since 2002-2006 while the length of highway in the low Collective Risk band has increased by 334km (+78%). For the 2012-2016 period, 62% of assessed state highways were in the low-medium to low Collective Risk band.

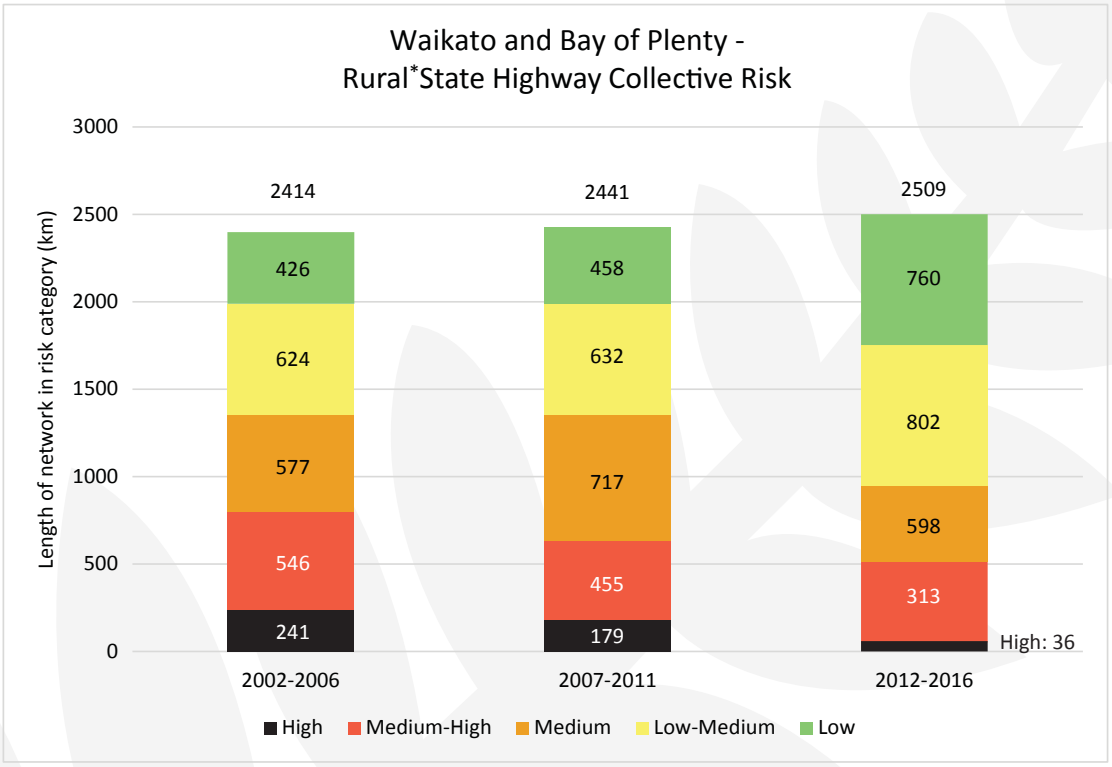


Figure 6: Changes in Collective Risk in the Waikato and Bay of Plenty Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Personal Risk

Figure 7 below shows how the level of Personal Risk has changed over time for rural state highways in the Waikato and Bay of Plenty region.

Over the three time periods (2002-2006, 2007-2011 and 2012-2016), the length of highway in the high Personal Risk band initially increased between 2002-2006 and 2007-2011 and then has reduced for the 2012-2016 period. Overall, since the initial KiwiRAP risk results in 2002-2006 the high Personal Risk length has reduced by 114km (-57%) while the length of highway in the low Personal Risk band has increased by 768km (+365%). For the 2012-2016 period, 48% of assessed state highways were in the low-medium to low Personal Risk band.

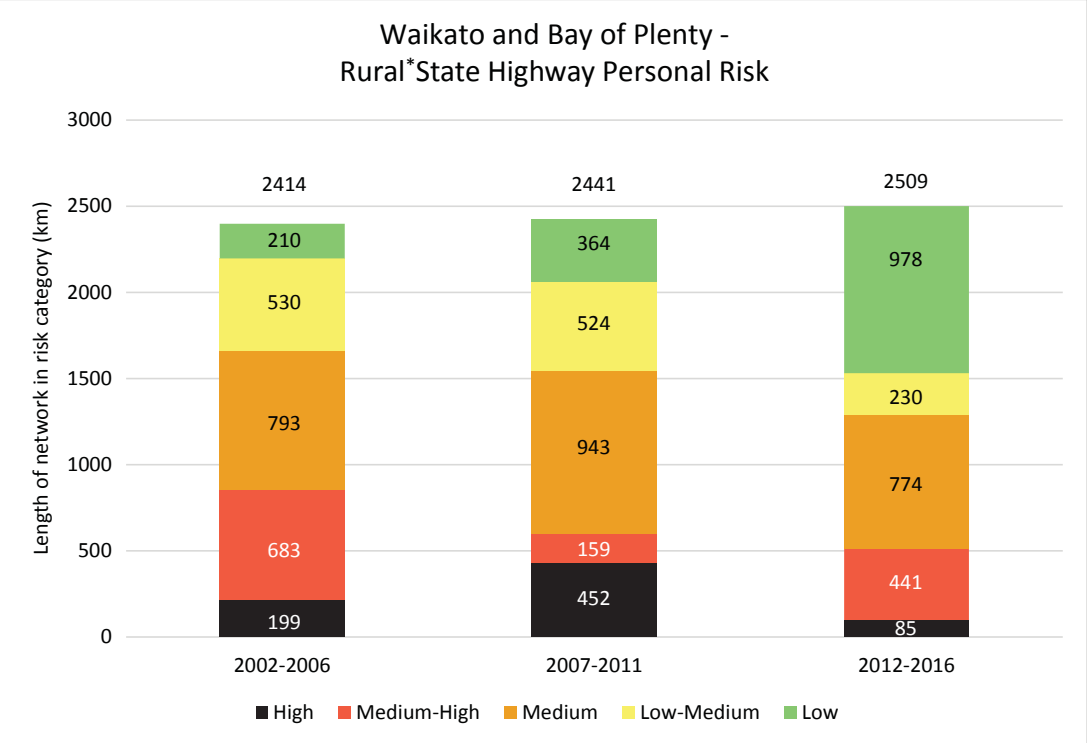


Figure 7: Changes in Personal Risk in the Waikato and Bay of Plenty Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Gisborne and Hawke's Bay Region

Collective Risk

Figure 8 below shows how the level of Collective Risk has changed over time for the rural state highway network in the Gisborne and Hawke's Bay region.

Over the three time periods (2002-2006, 2007-2011 and 2012-2016), Collective Risk in the Gisborne and Hawke's Bay region has followed the national trend of progressive improvement. The length of highway in the high Collective Risk band has reduced by 35km (-73%) since 2002-2006 while the length of highway on the low Collective Risk band has increased by 275km (+155%). For 2012-2016, 94% of the rural state highway network in the Gisborne and Hawke's Bay region was in the low-medium to low Collective Risk bands.

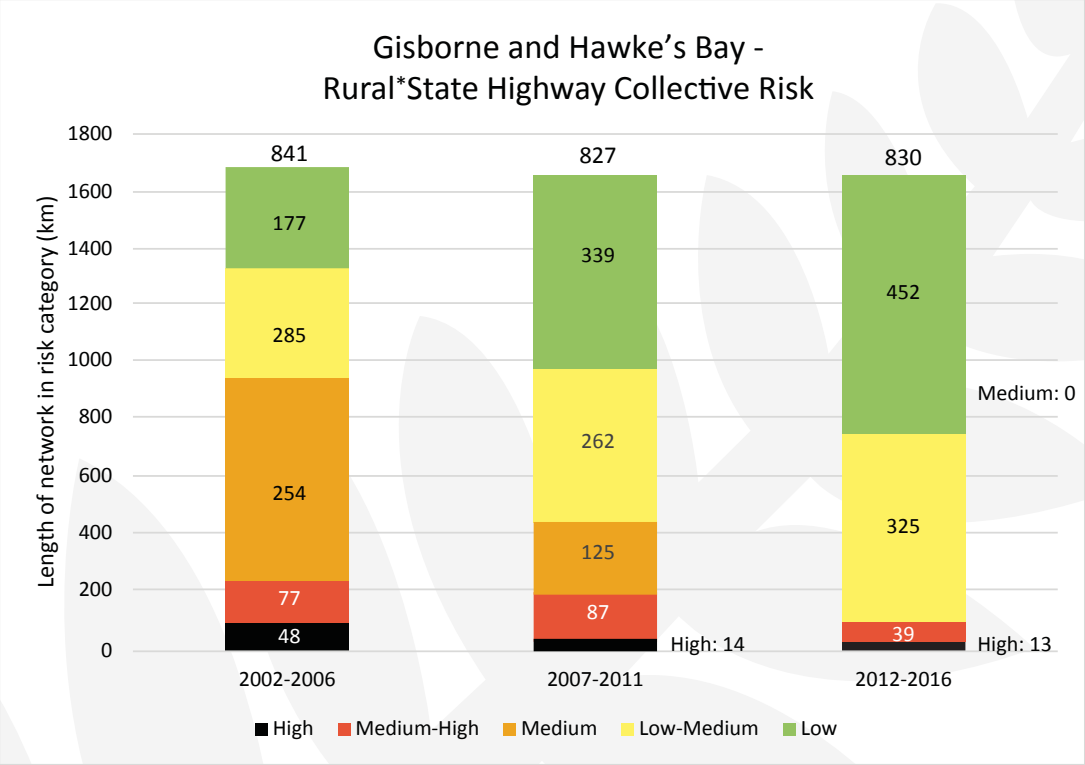


Figure 8: Changes in Collective Risk in the Gisborne and Hawke's Bay Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Personal Risk

Figure 9 below shows how the level of Personal Risk has changed over time for the rural state highway network in the Gisborne and Hawke's Bay region.

Over the three time periods (2002-2006, 2007-2011 and 2012-2016), the length of highway in the high Personal Risk band initially increased between 2002-2006 and 2007-2011 and then has reduced for the 2012-2016 period. Overall, since the initial KiwiRAP risk results in 2002-2006 the length of highway in the high Personal Risk band has dropped by 174km to 0km (100%) while the length of highway in the low Personal Risk band has increased from 0km to 118km. For 2012-2016, 16% of the rural state highway network in the Gisborne and Hawke's Bay region was in the low-medium to low Personal Risk band.

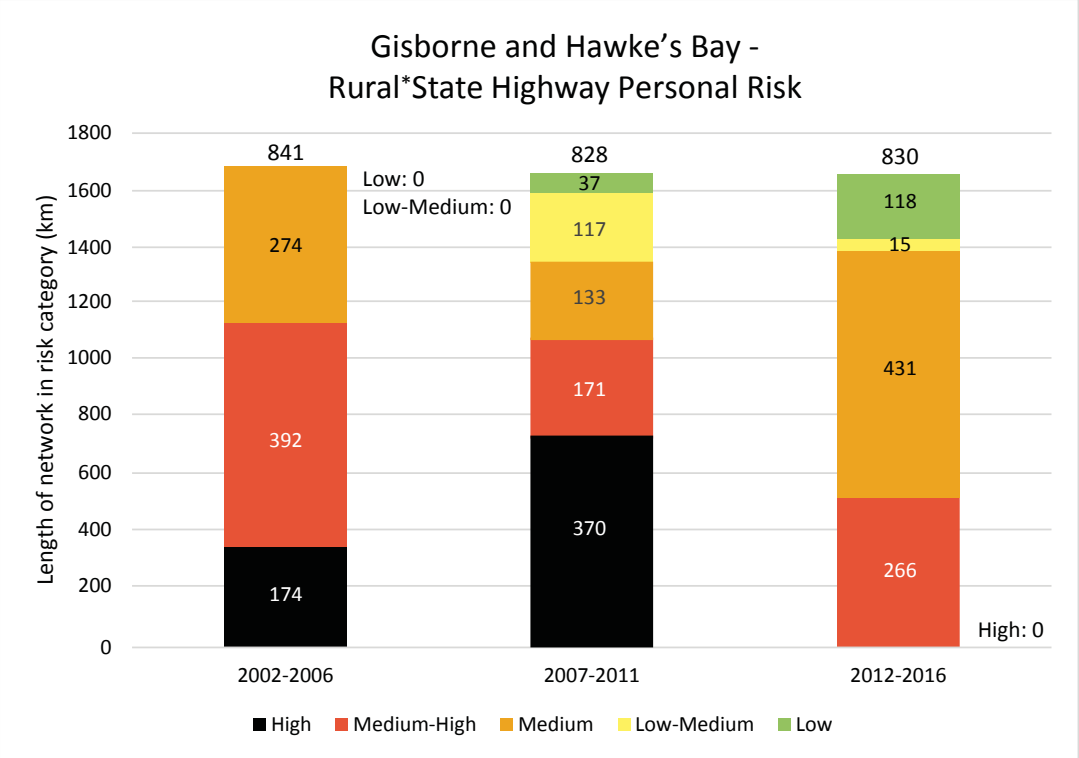


Figure 9: Changes in Personal Risk in the Gisborne and Hawke's Bay Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Taranaki, Manawatu-Whanganui and Wellington Region

Collective Risk

Figure 10 below shows how the level of Collective Risk has changed over time for the rural state highway network in the Taranaki, Manawatu-Whanganui and Wellington region.

Over the three time periods (2002-2006, 2007-2011 and 2012-2016), Collective Risk in the Taranaki, Manawatu-Whanganui and Wellington region has followed the national trend of progressive improvement. The length of highway in the high Collective Risk band has reduced by 93km (-62%) since 2002-2006 while the length of highway on the low Collective Risk band has increased by 186km (+76%). For 2012-2016, 60% of the rural state highway network in the Taranaki, Manawatu-Whanganui and Wellington region was in the low-medium to low Collective Risk bands.

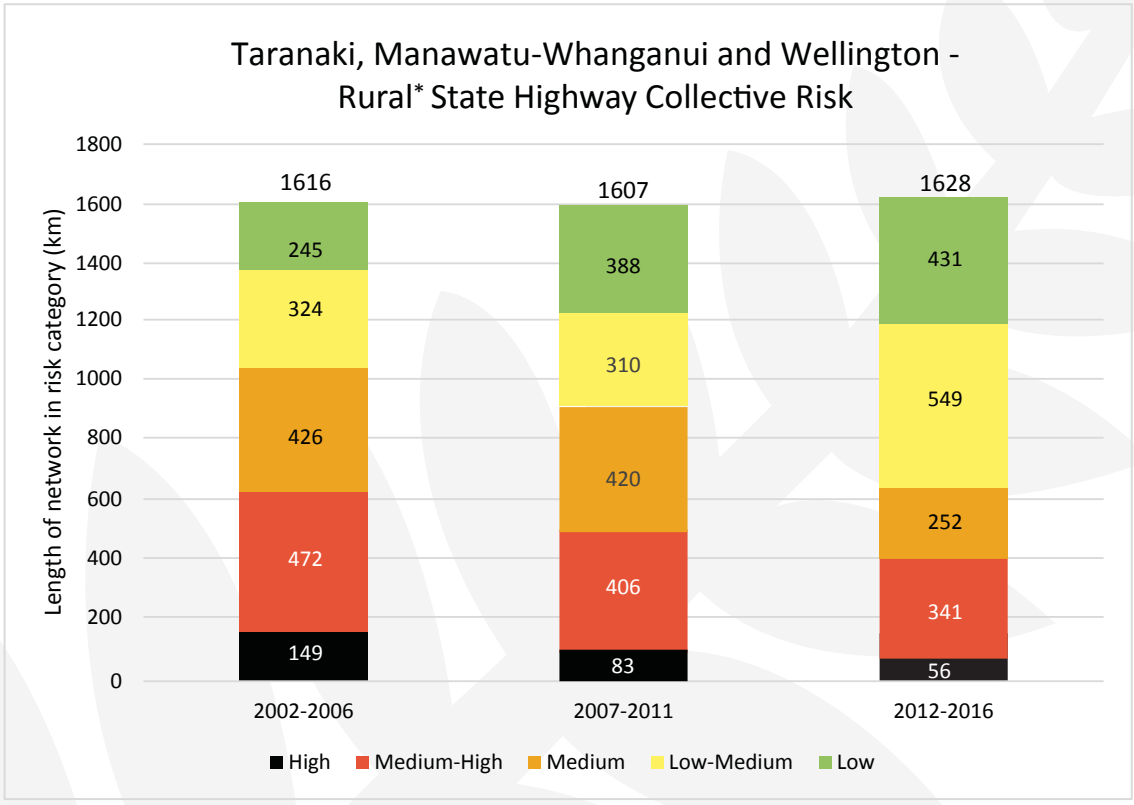


Figure 10: Changes in Collective Risk in the Taranaki, Manawatu-Whanganui and Wellington Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Personal Risk

Figure 11 below shows how the level of Personal Risk has changed over time for the rural state highway network in the Taranaki, Manawatu-Whanganui and Wellington region.

The pattern over the three periods (2002-2006, 2007-2011 and 2012-2016) for the Taranaki, Manawatu-Whanganui and Wellington region is similar to Collective Risk as it follows the national trend of progressive improvement. The length of highway in the high Personal Risk band has dropped by 36km (-16%) since 2002-2006 while the length of highway in the low Personal Risk band has increased by 439km (+263%). For 2012-2016, 56% of the rural state highway network in the Taranaki, Manawatu-Whanganui and Wellington region was in the low-medium to low Personal Risk band.

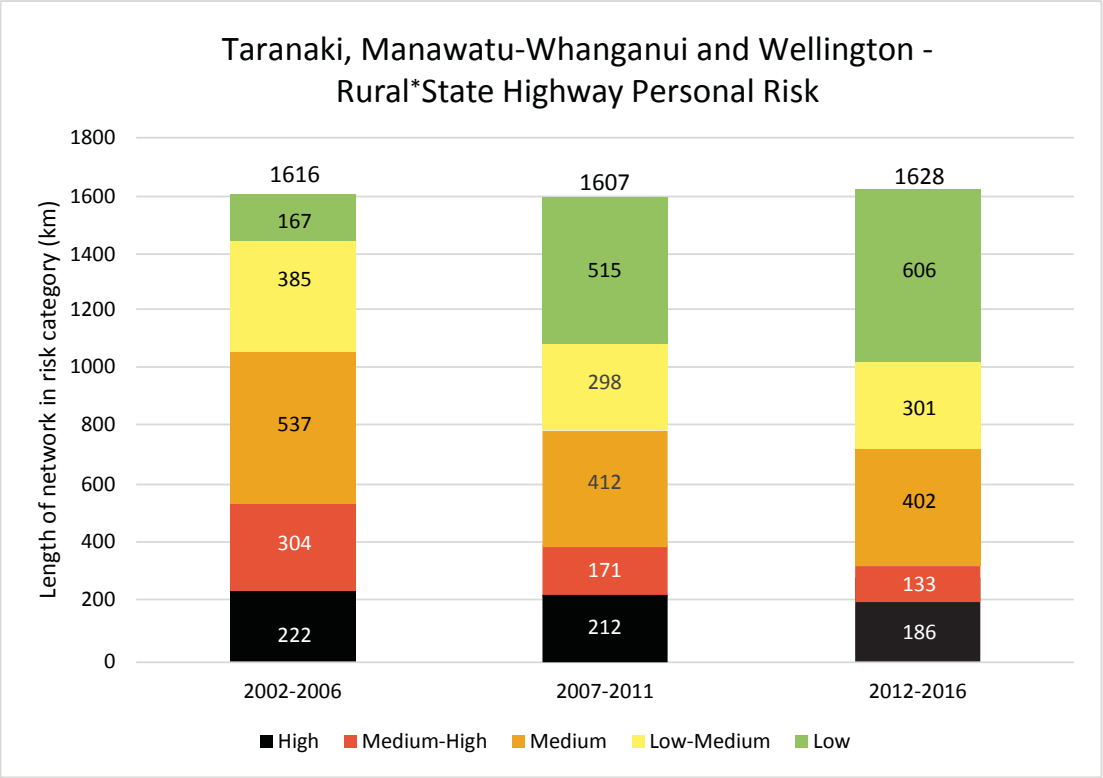


Figure 11: Changes in Personal Risk in the Taranaki, Manawatu-Whanganui and Wellington Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Tasman, Nelson, Marlborough, West Coast and Canterbury Region

Collective Risk

Figure 12 below shows how the level of Collective Risk has changed over time for the rural state highway network in the Tasman, Nelson, Marlborough, West Coast and Canterbury region.

Over the three time periods (2002-2006, 2007-2011 and 2012-2016), the proportion of the highway network with lower levels of Collective Risk has progressively increased. The length of highway in the high Collective Risk band dropped initially (comparing 2002-2006 and 2007-2011 results) but has increased with the latest results. Overall since the first KiwiRAP results (2002-2006) the length of network in the high Collective Risk band has reduced by 4km (-40%) while the length of highway on the low Collective Risk band has increased by 192km (+12%). For 2012-2016, 87% of the rural state highway network in the Tasman, Nelson, Marlborough, West Coast and Canterbury region was in the low-medium to low Collective Risk bands.

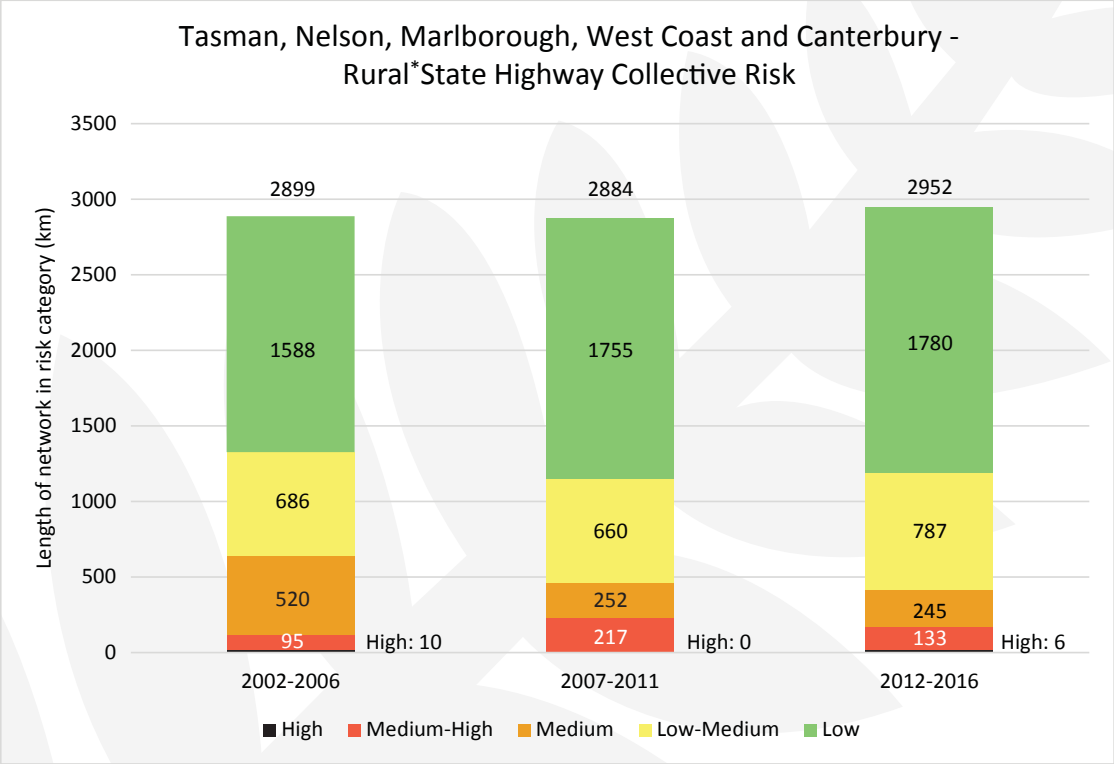


Figure 12: Changes in Collective Risk in the Tasman, Nelson, Marlborough, West Coast and Canterbury Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Personal Risk

Figure 13 below shows how the level of Personal Risk has changed over time for the rural state highway network in the Tasman, Nelson, Marlborough, West Coast and Canterbury region.

The pattern over the three periods (2002-2006, 2007-2011 and 2012-2016) shows an initial reduction in the length of network in the lowest Personal Risk band and increase in the highest Personal Risk band followed by improvements in the length of network in both the low and high Personal Risk categories in the latest (2012-2016) results. Overall, the length of highway in the high Personal Risk band has dropped by 214km (52%) since 2002-2006 while the length of highway in the low Personal Risk band has increased by 522km (+98%). For 2012-2016, 63% of the rural state highway network in the Tasman, Nelson, Marlborough, West Coast and Canterbury region was in the low-medium to low Personal Risk band.

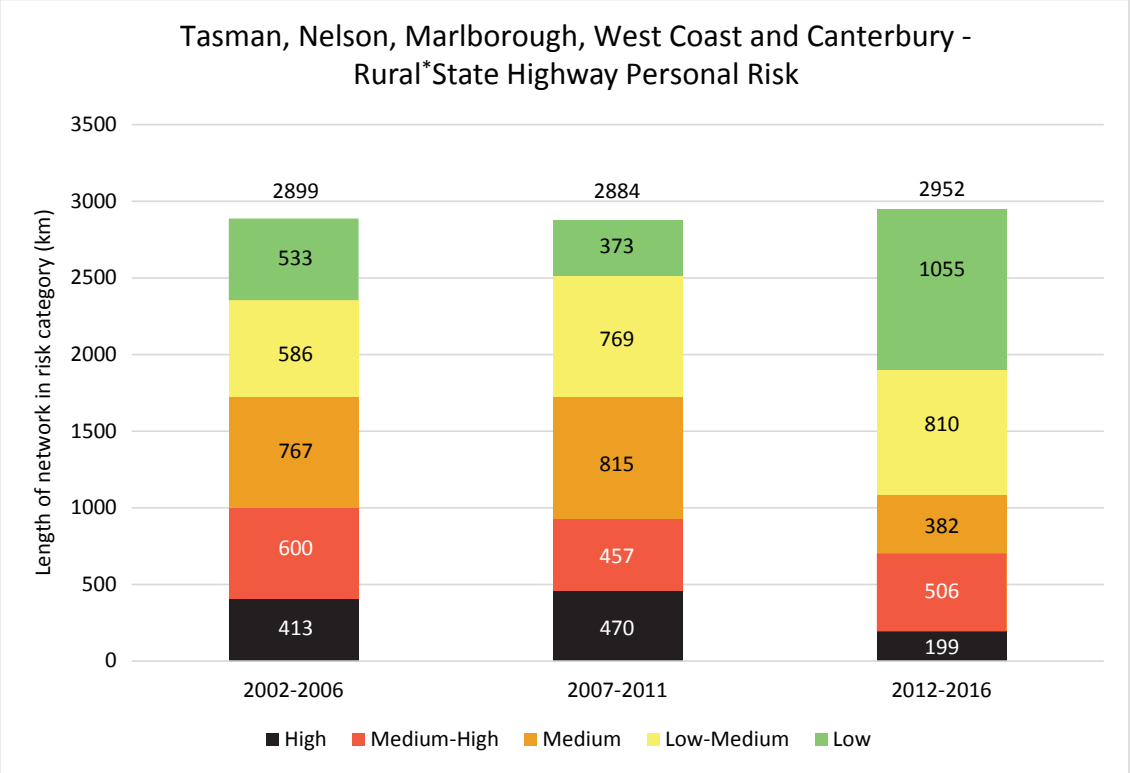


Figure 13: Changes in Personal Risk in the Tasman, Nelson, Marlborough, West Coast and Canterbury Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Otago and Southland Region

Collective Risk

Figure 14 below shows how the level of Collective Risk has changed over time for the rural state highway network in the Otago and Southland region.

Over the three time periods (2002-2006, 2007-2011 and 2012-2016), the length of highway in the high and medium high Collective Risk bands has followed the national trend by progressively decreasing. The length of network in the low Collective Risk band has slightly decreased over the last two time periods (comparing 2012-16 with 2007-2011). Overall, the length of highway in the high Collective Risk band has reduced by 20km (100%) since 2002-2006 while the length of highway in the low Collective Risk band has increased by 664km (133%). For 2012-2016, 86% of the rural state highway network in the Otago and Southland region was in the low-medium to low Collective Risk bands.

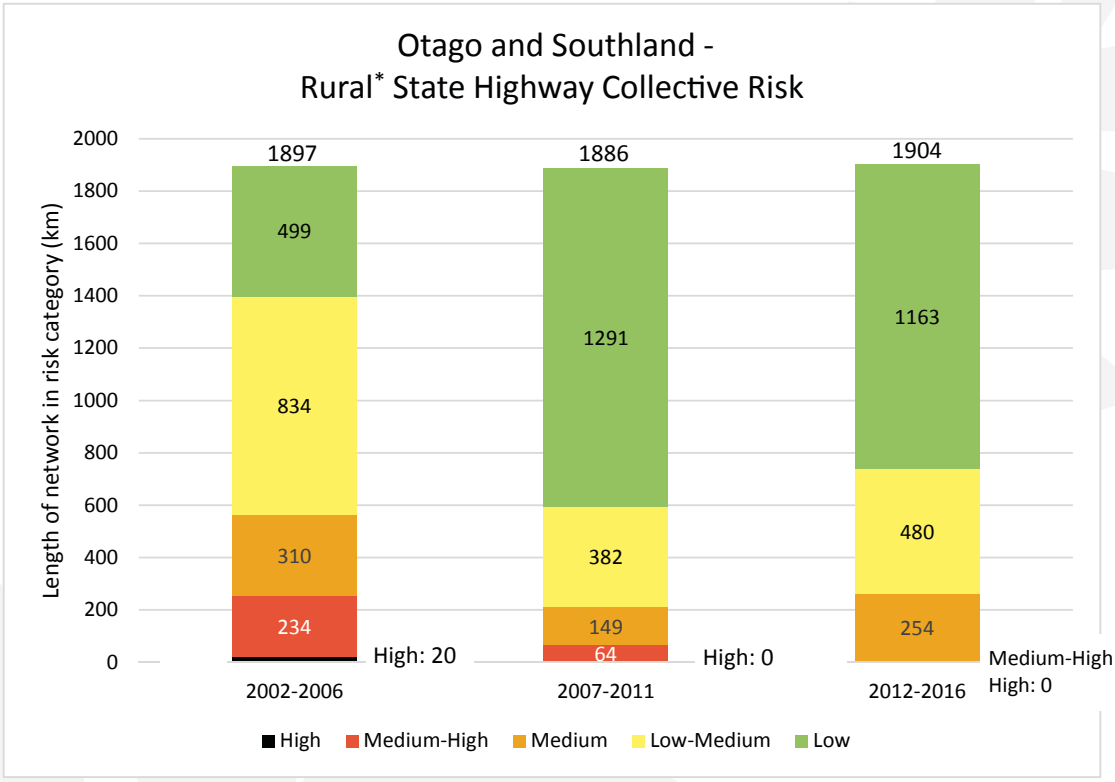


Figure 14: Changes in Collective Risk in the Otago and Southland Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Personal Risk

Figure 15 below shows how the level of Personal Risk has changed over time for the rural state highway network in the Otago and Southland region.

Over the three time periods (2002-2006, 2007-2011 and 2012-2016), the length of highway in the low Personal Risk band has followed the national trend by progressively increasing. The length of highway in the High Personal Risk band has initially decreased and then slightly increased over the last two time periods (comparing 2012-2016 with 2007-2011). Overall, the length of highway in the high Personal Risk band has dropped by 648km (-67%) since 2002-2006 while the length of highway in the low Personal Risk band has increased by 463km (+759%). For 2012-2016, 39% of the rural state highway network in the Otago and Southland region was in the low-medium to low Personal Risk band.

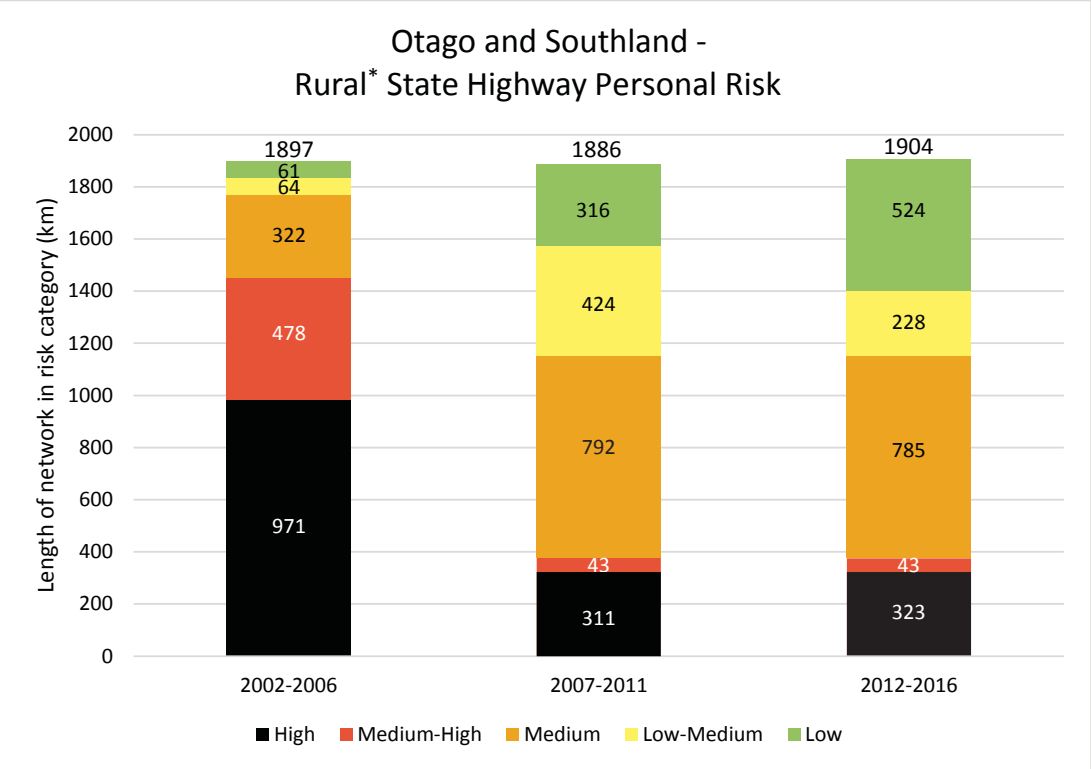
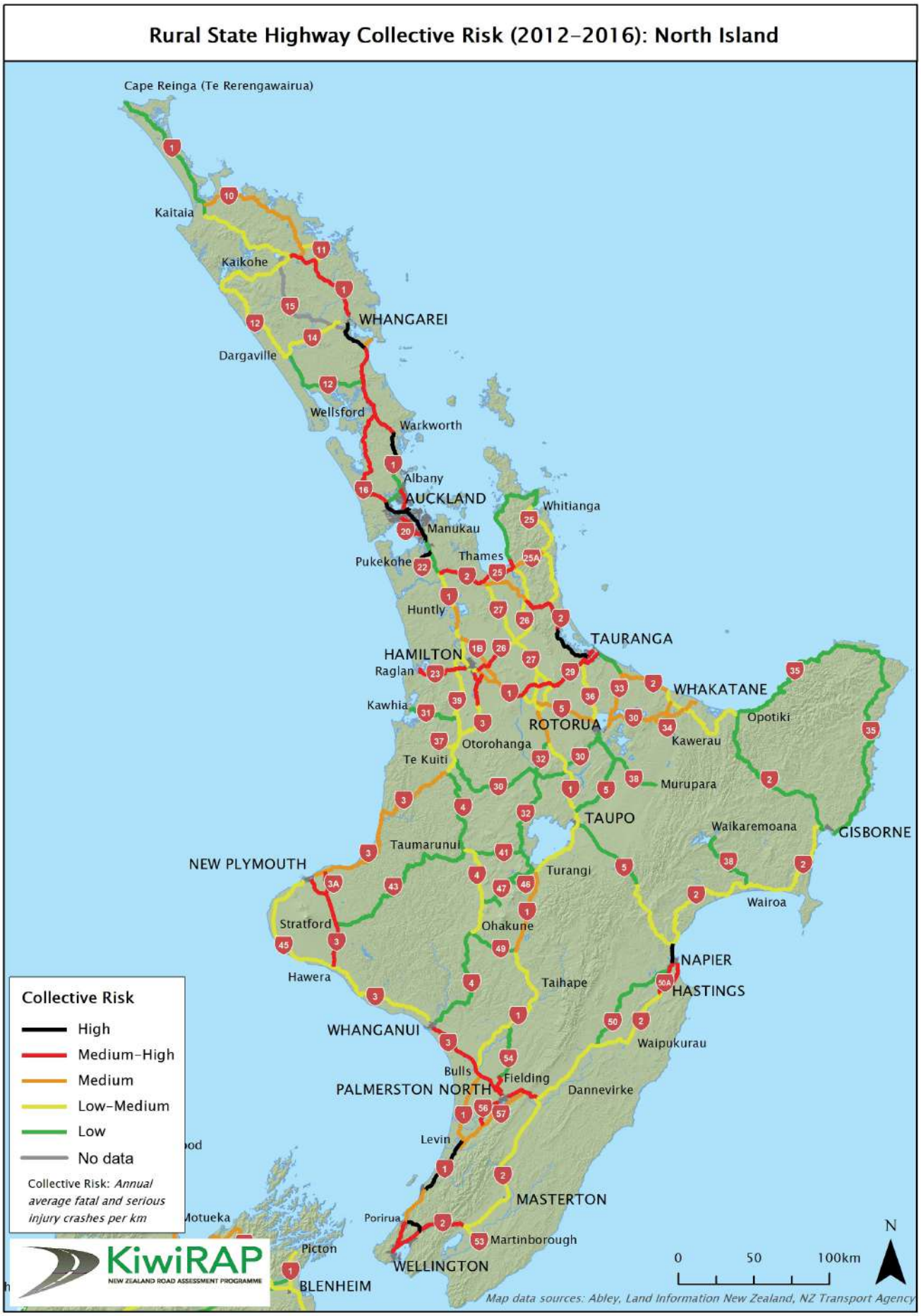


Figure 15: Changes in Personal Risk in the Otago and Southland Region (comparing 2002-2006, 2007-2011 and 2012-2016 data)

*KiwiRAP reports on state highway links that have speed limits of 80km/h or more. NB: Individual bars may not sum perfectly due to rounding

Maps


Rural State Highway Collective Risk (2012–2016): North Island
Cape Reinga (Te Rerengawairua)
Kaitaia
Kaikohe
WHANGAREI
Dargaville
Wellsford
Warkworth
Albany
AUCKLAND
Whitianga
Manukau
Pukekohe
Thames
Huntly
TAURANGA
HAMILTON
Raglan
WHAKATANE
Kawhia
ROTORUA
Opotiki
Kawerau
Otorohanga
Te Kuiti
Murupara
TAUPO
Waikaremoana
GISBORNE
Taumarunui
NEW PLYMOUTH
Turangi
Wairoa
Stratford
Ohakune
NAPIER
Hawera
Taihape
HASTINGS
WHANGANUI
Waipukurau
Bulls
Fielding
PALMERSTON NORTH
Dannevirke
Levin
MASTERTON
Porirua
Martinborough
Picton
WELLINGTON
BLENHEIM
Collective Risk
High
Medium-High
Medium
Low-Medium
Low
No data
Collective Risk: Annual average fatal and serious injury crashes per km
KiwiRAP
NEW ZEALAND ROAD ASSESSMENT PROGRAMME
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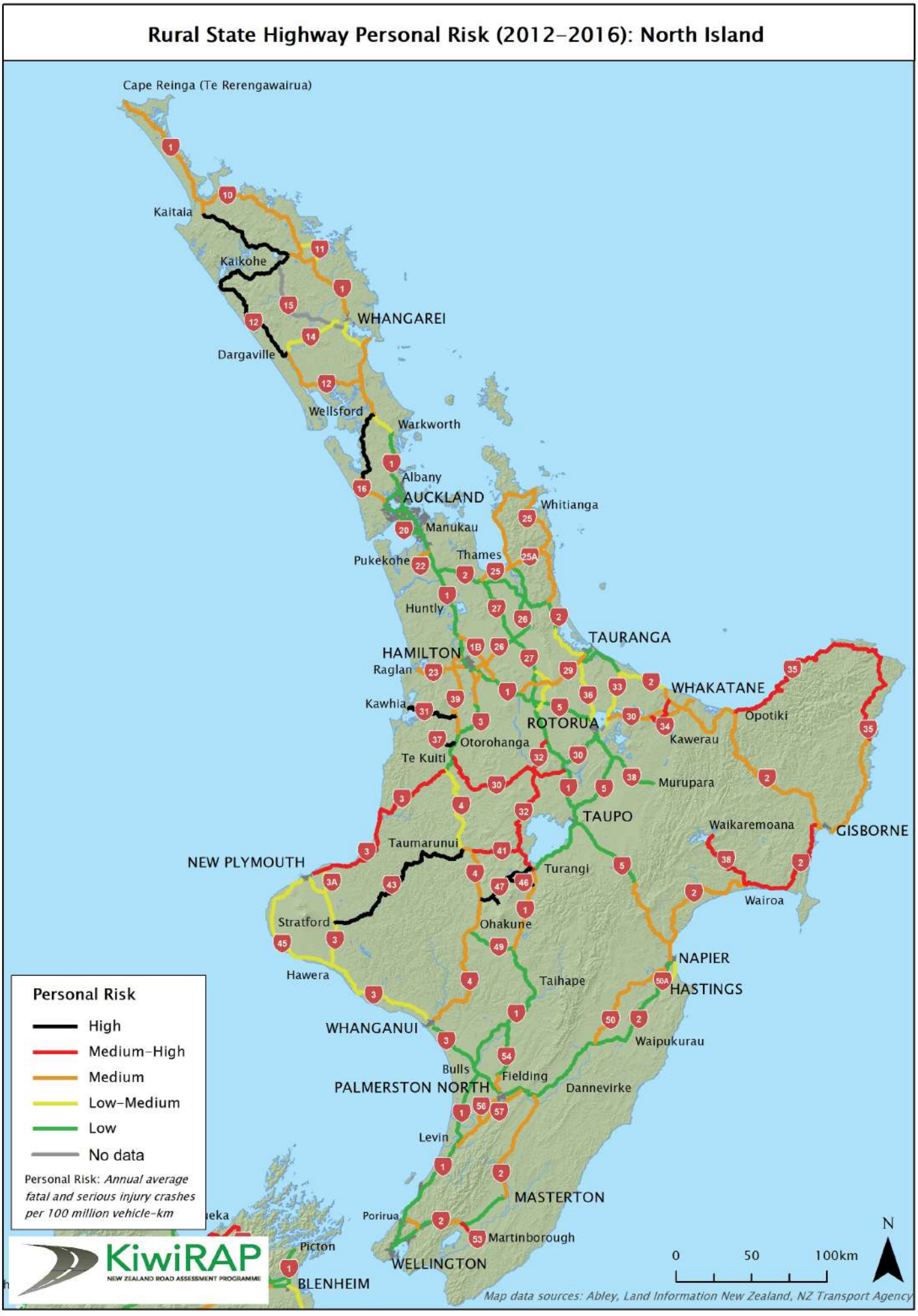
100km
N
Map data sources: Ableyl, Land Information New Zealand, NZ Transport Agency


Rural State Highway Personal Risk (2012–2016): North Island
Cape Reinga (Te Rerengawairua)
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Albany
AUCKLAND
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Waikaremoana
GISBORNE
Taumarunui
NEW PLYMOUTH
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WHANGANUI
Waipukurau
Bulls
Fielding
PALMERSTON NORTH
Dannevirke
Levin
MASTERTON
Porirua
Martinborough
Picton
WELLINGTON
BLENHEIM
Personal Risk
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Low-Medium
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Personal Risk: Annual average fatal and serious injury crashes per 100 million vehicle-km
KiwiRAP
NEW ZEALAND ROAD ASSESSMENT PROGRAMME
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100km
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Map data sources: Abley, Land Information New Zealand, NZ Transport Agency


Rural State Highway Collective Risk (2012–2016): South Island
Collingwood
Motueka
NELSON
Picton
BLENHEIM
Mokihinui
Westport
Murchison
Reefton
GREYMOUTH
Hanmer Springs
Kaikoura
Hokitika
Arthur's Pass
Waipara
Rangiora
Franz Josef/Waiau
CHRISTCHURCH
Aoraki/Mount Cook
Akaroa
Haast
Ashburton
TIMARU
Omarama
Milford Sound
Waimate
Wanaka
Queenstown
OAMARU
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Te Anau
Palmerston
Lumsden
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Gore
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Edendale
INVERCARGILL
Bluff
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Collective Risk: Annual average fatal and serious injury crashes per km
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Map data sources: Abley, Land Information New Zealand, NZ Transport Agency
KiwiRAP
NEW ZEALAND ROAD ASSESSMENT PROGRAMME


Rural State Highway Personal Risk (2012–2016): South Island
Collingwood
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Murchison
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GREYMOUTH
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Personal Risk: Annual average fatal and serious injury crashes per 100 million vehicle-km
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Map data sources: Abley, Land Information New Zealand, NZ Transport Agency
KiwiRAP
NEW ZEALAND ROAD ASSESSMENT PROGRAMME


Rural State Highway Collective Risk (2012–2016): Northland and Auckland
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Kaitaia
Kerikeri
Paihia
Opononi
Kaikohe
WHANGAREI
Otaika
Marsden Point
Dargaville
Ruawai
Wellsford
Warkworth
Puhoi
Helensville
Albany
AUCKLAND
Manukau
Papakura
Pukekohe
Pokeno
Meremere
Collective Risk
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Collective Risk: Annual average fatal and serious injury crashes per km
KiwiRAP
NEW ZEALAND ROAD ASSESSMENT PROGRAMME
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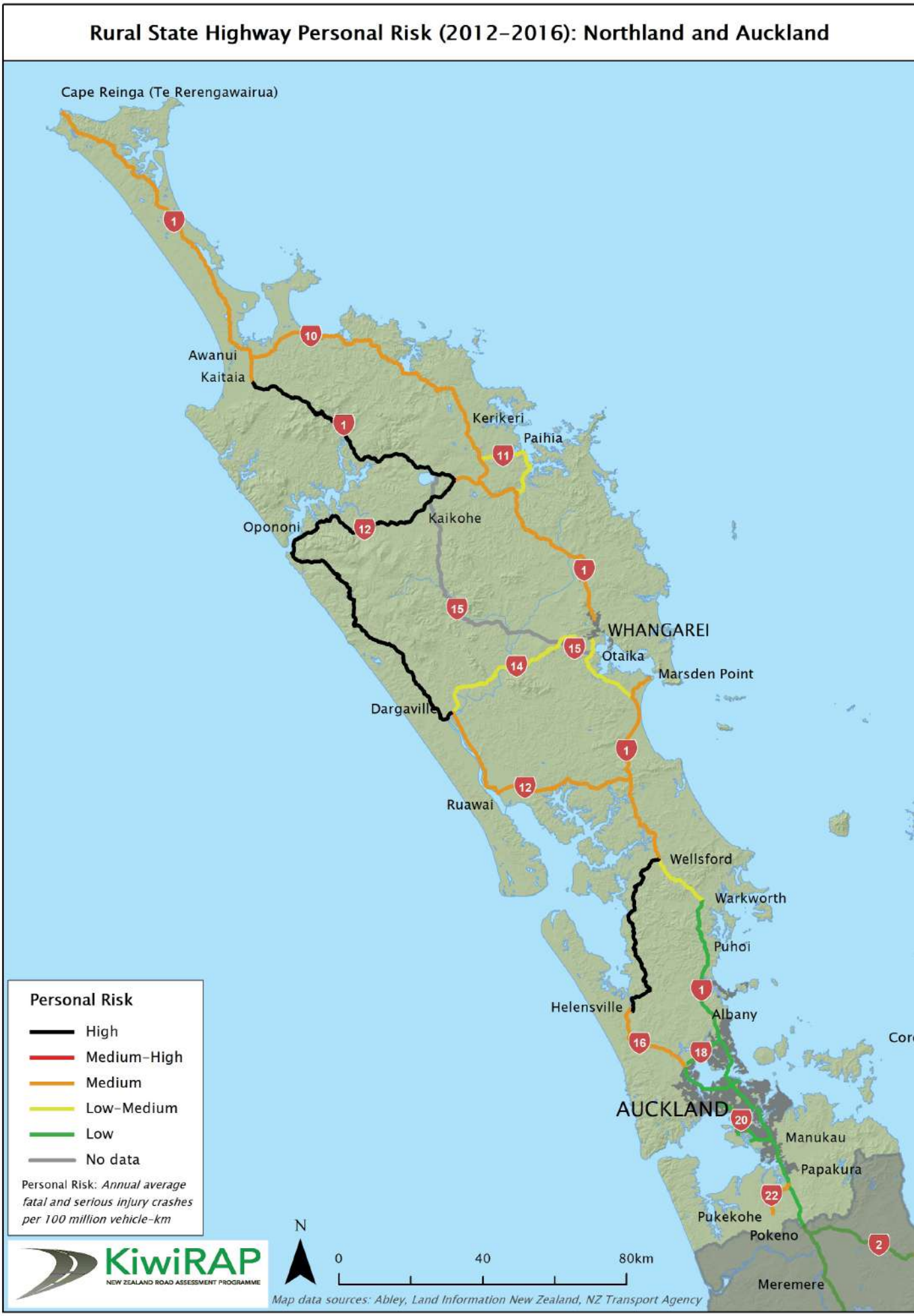
Map data sources: Abley, Land Information New Zealand, NZ Transport Agency


Rural State Highway Personal Risk (2012–2016): Northland and Auckland
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Personal Risk: Annual average fatal and serious injury crashes per 100 million vehicle-km
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NEW ZEALAND ROAD ASSESSMENT PROGRAMME
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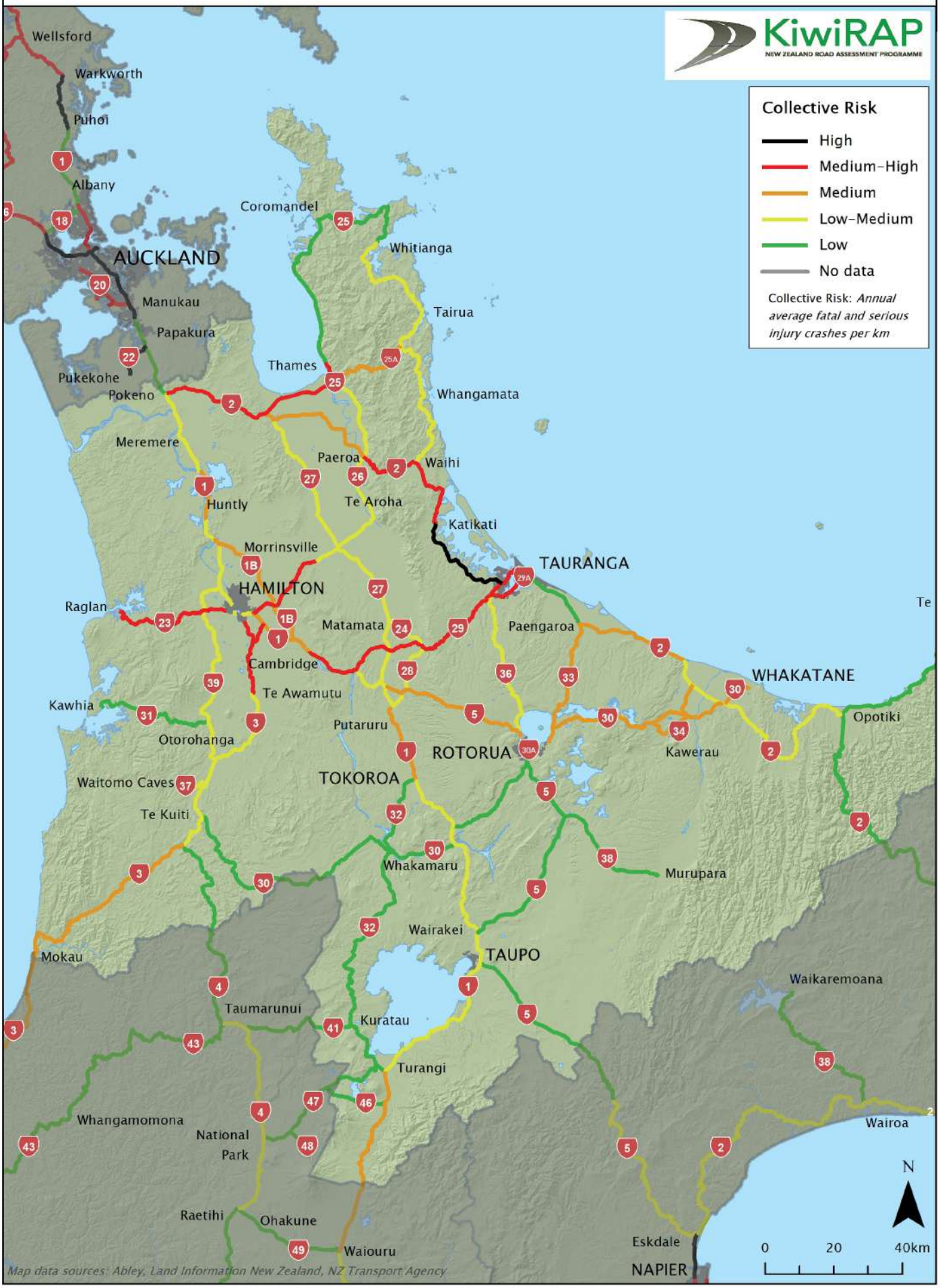
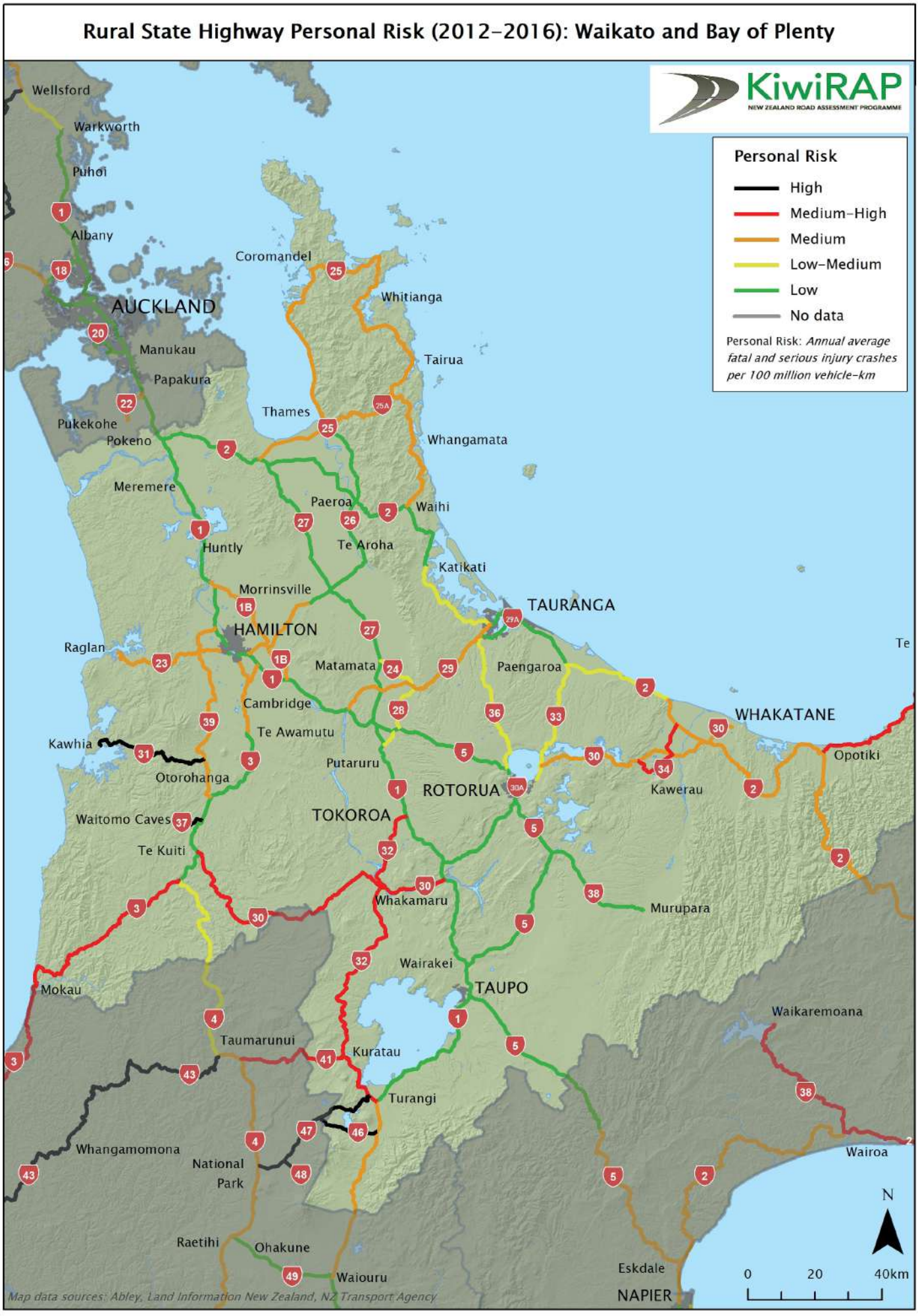
Map data sources: Abley, Land Information New Zealand, NZ Transport Agency

Rural State Highway Collective Risk (2012–2016): Waikato and Bay of Plenty

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No data
Personal Risk: Annual average fatal and serious injury crashes per 100 million vehicle-km
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Warkworth
Puhoi
Albany
AUCKLAND
Manukau
Papakura
Pukekohe
Pokeno
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TOKOROA
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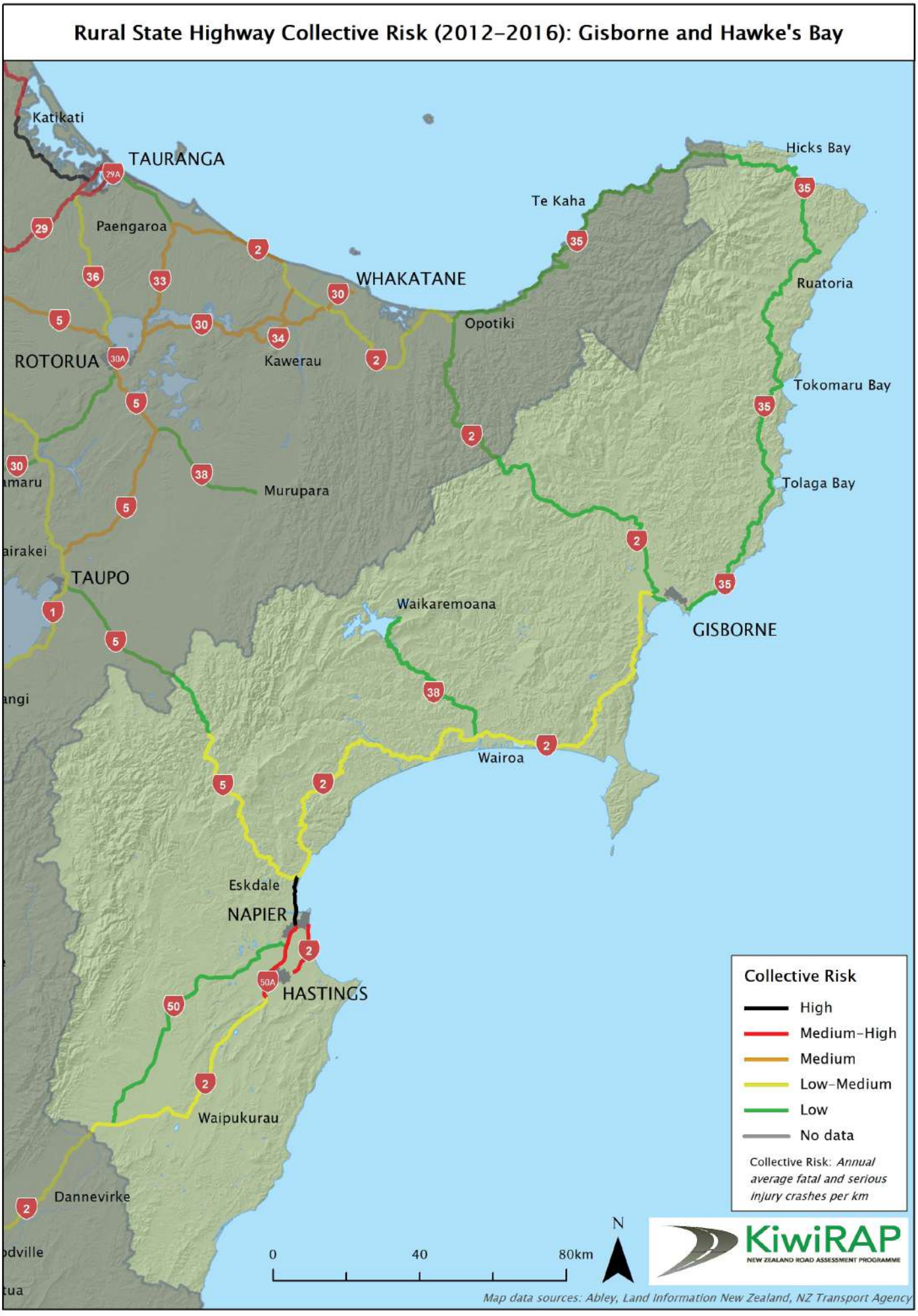
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Opotiki
ROTORUA
Kawerau
Tokomaru Bay
Tolaga Bay
Murupara
TAUPO
Waikaremoana
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Wairoa
Eskdale
NAPIER
HASTINGS
Waipukurau
Dannevirke
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Collective Risk: Annual average fatal and serious injury crashes per km
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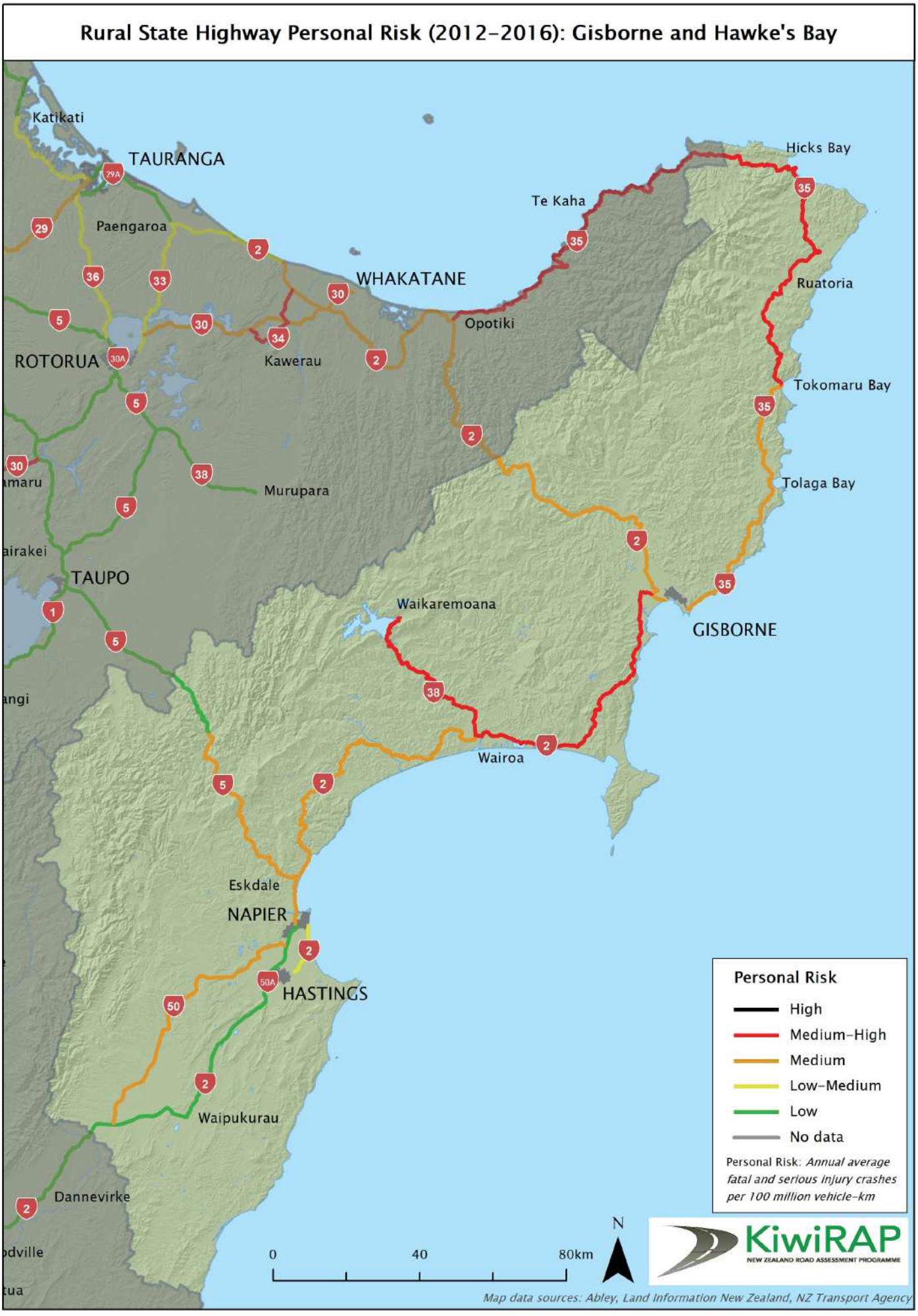
Map data sources: Abley, Land Information New Zealand, NZ Transport Agency


Rural State Highway Personal Risk (2012–2016): Gisborne and Hawke's Bay
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Personal Risk: Annual average fatal and serious injury crashes per 100 million vehicle-km
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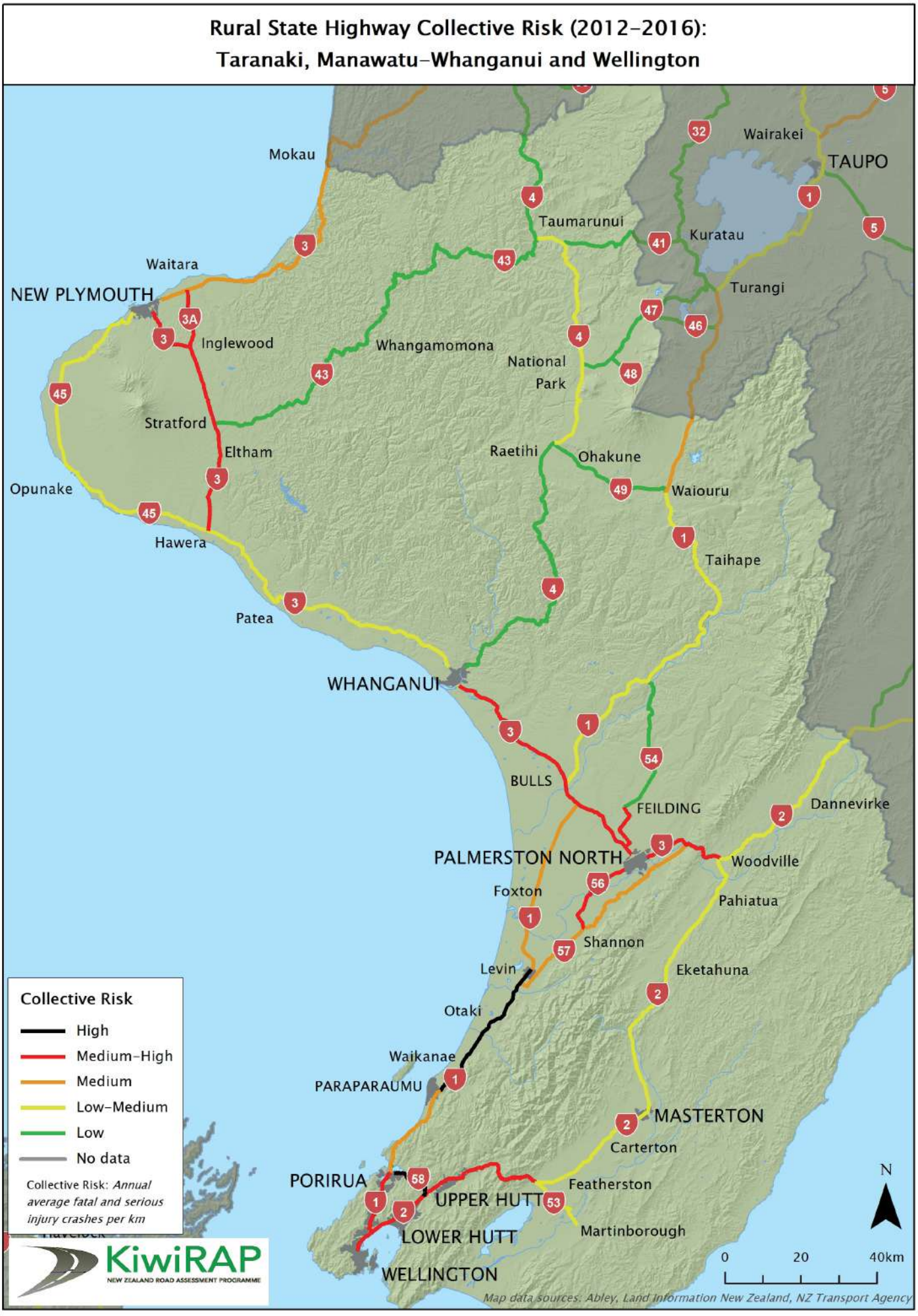
NEW ZEALAND ROAD ASSESSMENT PROGRAMME
Map data sources: Abley, Land Information New Zealand, NZ Transport Agency


Rural State Highway Collective Risk (2012–2016):
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Kuratau
Turangi
BULLS
FEILDING
PALMERSTON NORTH
Foxton
Shannon
Levin
Otaki
Waikanae
PARAPARAUMU
Dannevirke
Woodville
Pahiatua
Eketahuna
MASTERTON
Carterton
Featherston
Martinborough
PORIRUA
UPPER HUTT
LOWER HUTT
WELLINGTON
Collective Risk
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Low–Medium
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Collective Risk: Annual average fatal and serious injury crashes per km
KiwiRAP
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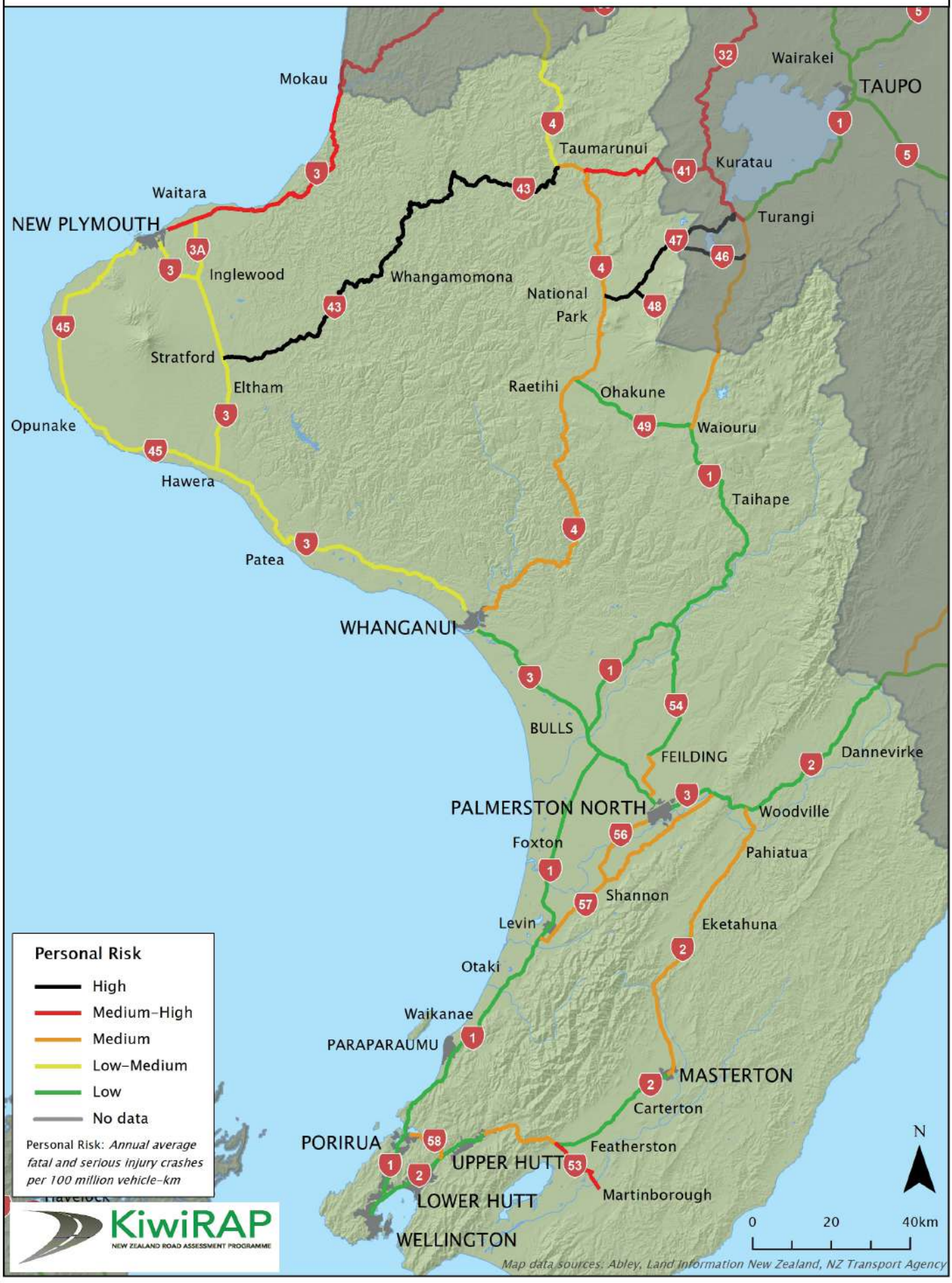
Map data sources: Abley, Land Information New Zealand, NZ Transport Agency

Rural State Highway Personal Risk (2012–2016): Taranaki, Manawatu–Whanganui and Wellington




Rural State Highway Collective Risk (2012–2016):
Tasman, Nelson, Marlborough, West Coast and Canterbury
Collingwood
Takaka
Motueka
NELSON
RICHMOND
Havelock
Picton
Renwick
BLENHEIM
Mokihinui
Westport
Murchison
St Arnaud
Punakaiki
Reefton
Springs Junction
Greymouth
Hanmer Springs
Kaikoura
Hokitika
Culverden
Arthur's Pass
Waipara
Amberley
Rangiora
Kaiapoi
Franz Josef/Waiau
CHRISTCHURCH
Darfield
Rolleston
Methven
Aoraki/Mount Cook
Akaroa
ASHBURTON
Haast
Tekapo
Geraldine
Fairlie
Temuka
Twizel
TIMARU
Omarama
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Waimate
Wanaka
Cromwell
Ranfurly
Kyeburn
OAMARU
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Palmerston
Collective Risk
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No data
Collective Risk: Annual average fatal and serious injury crashes per km
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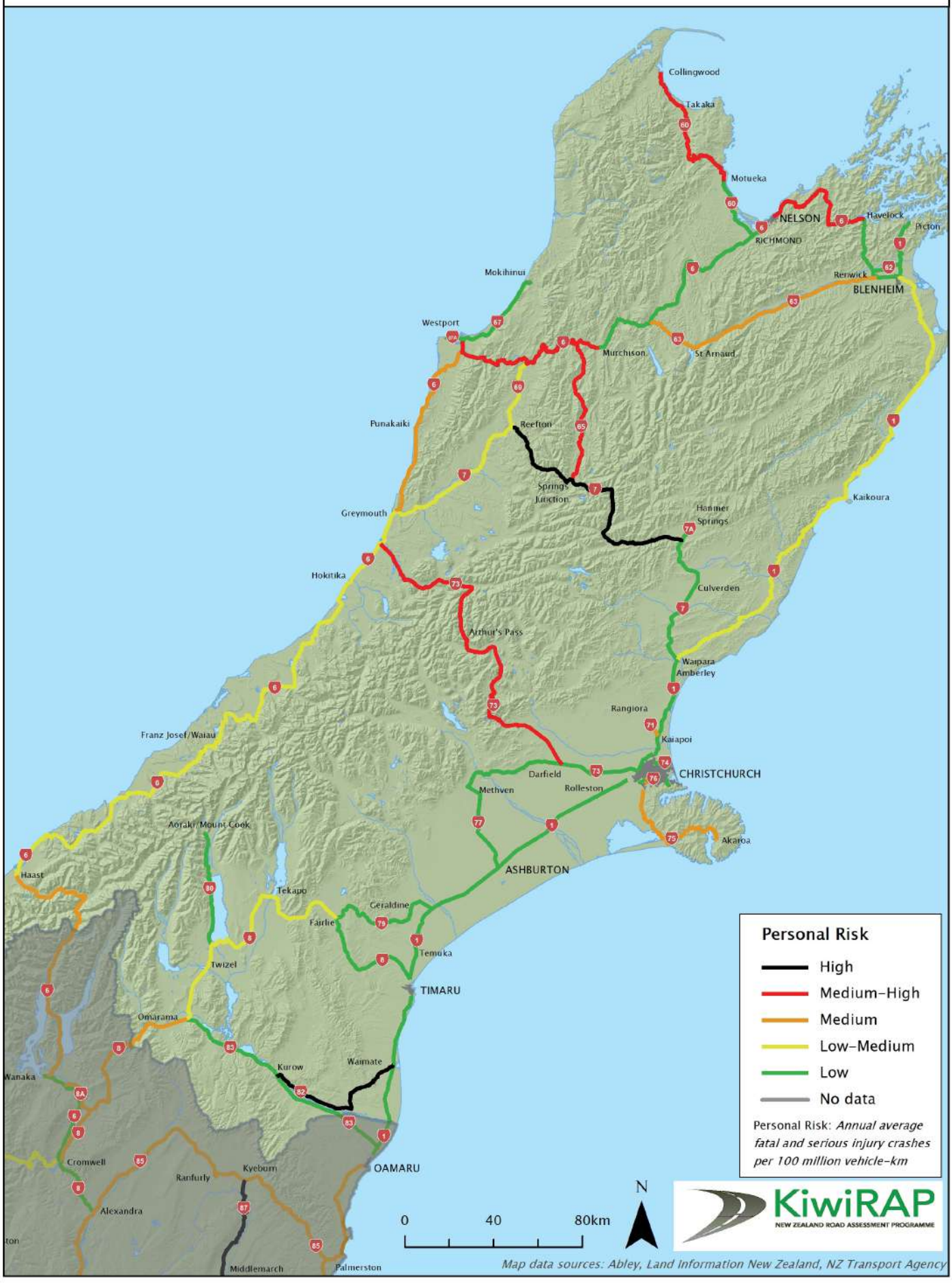
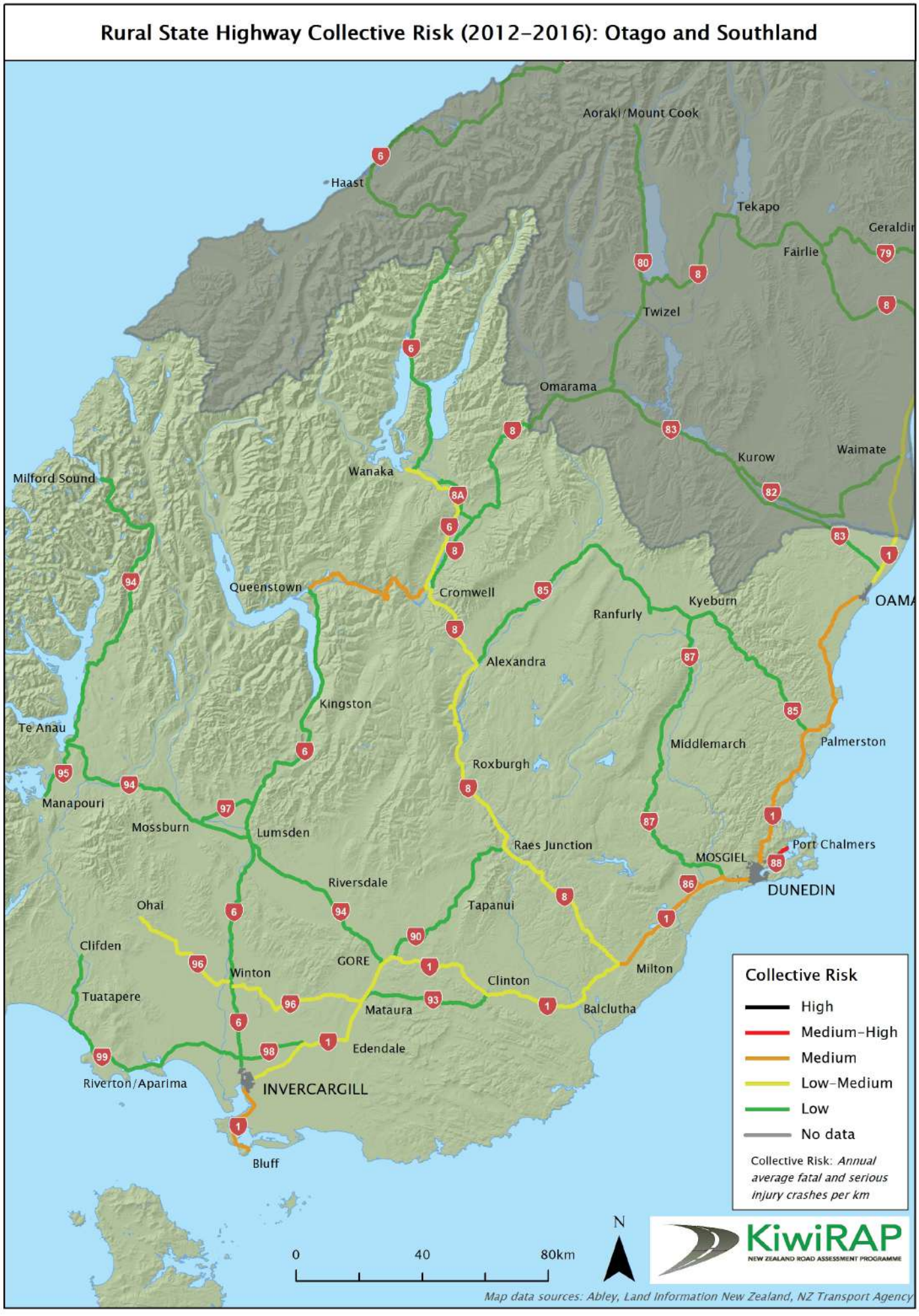
80km
KiwiRAP
NEW ZEALAND ROAD ASSESSMENT PROGRAMME
Map data sources: Abley, Land Information New Zealand, NZ Transport Agency

Rural State Highway Personal Risk (2012–2016): Tasman, Nelson, Marlborough, West Coast and Canterbury




Rural State Highway Collective Risk (2012–2016): Otago and Southland
Aoraki/Mount Cook
Haast
Tekapo
Fairlie
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Omarama
Kurow
Waimate
Wanaka
Milford Sound
Queenstown
Cromwell
Ranfurly
Kyeburn
Alexandra
Kingston
Te Anau
Middlemarch
Palmerston
Roxburgh
Manapouri
Mossburn
Lumsden
Raes Junction
Port Chalmers
MOSGIEL
DUNEDIN
Riversdale
Ohai
Tapanui
Clifden
GORE
Winton
Clinton
Milton
Tuatapere
Mataura
Balclutha
Edendale
Riverton/Aparima
INVERCARGILL
Bluff
Collective Risk
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Collective Risk: Annual average fatal and serious injury crashes per km
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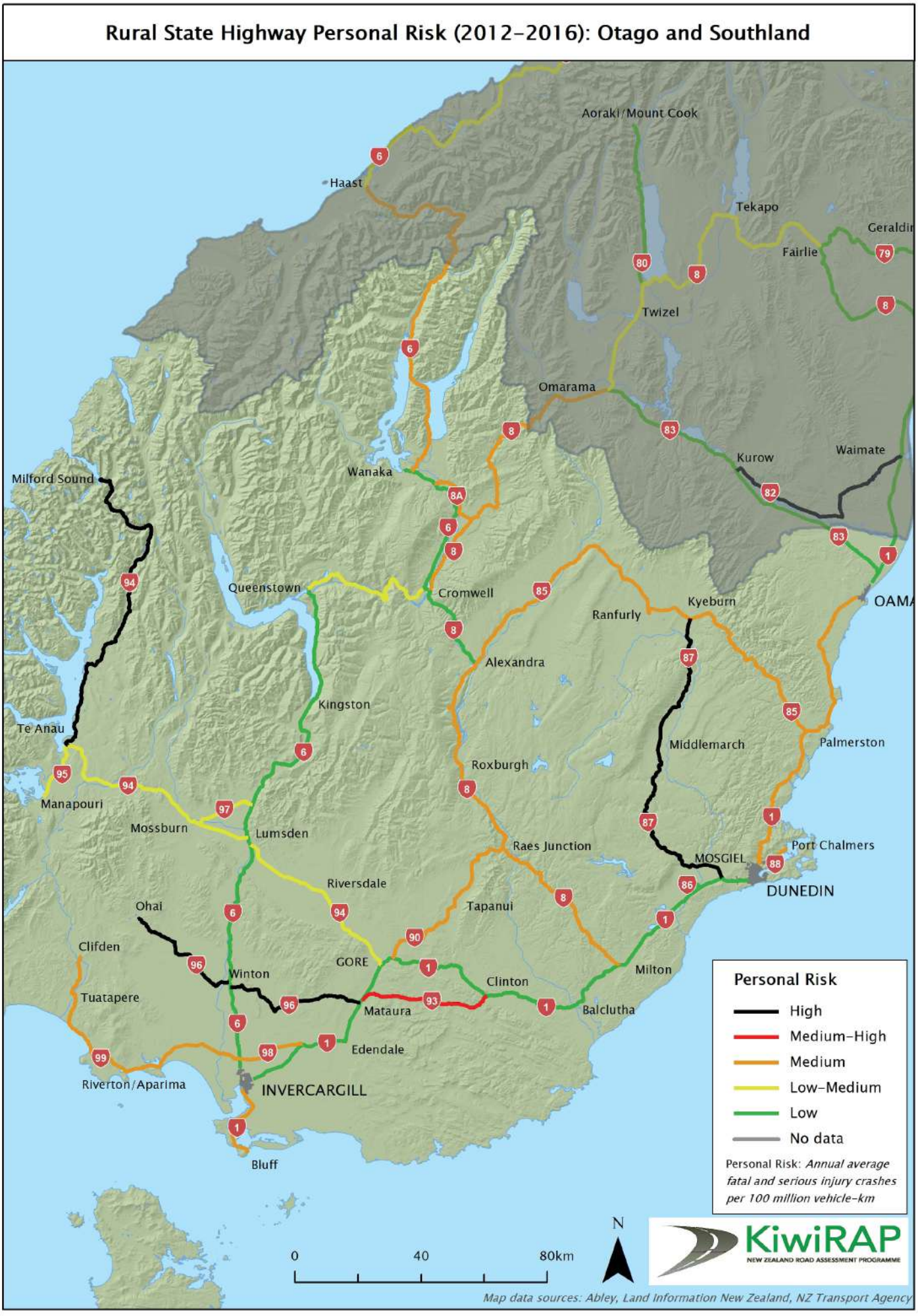
KiwiRAP
NEW ZEALAND ROAD ASSESSMENT PROGRAMME
Map data sources: Abley, Land Information New Zealand, NZ Transport Agency


Rural State Highway Personal Risk (2012–2016): Otago and Southland
Aoraki/Mount Cook
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Waimate
Milford Sound
Wanaka
Queenstown
Cromwell
Ranfurly
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Manapouri
Mossburn
Lumsden
Raes Junction
Port Chalmers
MOSGIEL
DUNEDIN
Riversdale
Ohai
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Clifden
GORE
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Edendale
Riverton/Aparima
INVERCARGILL
Bluff
Personal Risk
High
Medium–High
Medium
Low–Medium
Low
No data
Personal Risk: Annual average fatal and serious injury crashes per 100 million vehicle-km
N
0
40
80km
KiwiRAP
NEW ZEALAND ROAD ASSESSMENT PROGRAMME
Map data sources: Abley, Land Information New Zealand, NZ Transport Agency

Table of all Links

Link Name	Region(s)	Length(km)	2002 - 2006				2007 - 2011				2012 - 2016			
			Crashes		KiwiRAP Risk		Crashes		KiwiRAP Risk		Crashes		KiwiRAP Risk	
			Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal
SH 1 from Albany to Twin Tunnels	Northland and Auckland	48.352	0	4	L	L	1	4	L	L	1	8	L	L
SH 1 from Auckland to Takanini	Northland and Auckland	50.098	14	54	H	L	8	46	H	L	6	44	H	L
SH 1 from Cape Reinga to Kaitaia	Northland and Auckland	109.459	7	9	L	MH	2	9	L	M	3	10	L	M
SH 1 from Kaitaia to Ohaeawai	Northland and Auckland	79.690	2	11	L	M	2	21	LM	H	1	20	LM	H
SH 1 from Marsden Point (SH 15A) to Whangarei	Northland and Auckland	24.205	8	19	H	LM	5	12	MH	L	11	16	H	LM
SH 1 from Ruakaka to Wellsford	Northland and Auckland	53.911	12	41	H	M	10	29	MH	LM	10	34	MH	M
SH 1 from Warkworth to Wellsford	Northland and Auckland	18.600	10	18	H	MH	9	17	H	MH	2	11	MH	LM
SH 1 from Whangarei to Ohaeawai	Northland and Auckland	71.933	16	30	MH	M	14	24	MH	LM	13	33	MH	M
SH 1 Northern Motorway (Auckland to Albany)	Northland and Auckland	32.339	3	22	MH	L	1	30	MH	L	2	27	MH	L
SH 1 Warkworth to Twin Tunnels	Northland and Auckland	19.208	10	24	H	M	4	11	MH	L	8	13	H	L
SH 10 from Awanui to SH 1 South (Pakaraka)	Northland and Auckland	103.691	9	41	M	H	10	36	M	MH	9	26	M	M
SH 11 from Kawakawa to Puketona (SH 10)	Northland and Auckland	29.667	2	14	MH	H	1	11	M	MH	0	7	LM	LM
SH 12 from Dargaville to Ohaeawai	Northland and Auckland	147.749	8	25	LM	H	8	21	LM	H	3	31	LM	H
SH 12 from Dargaville to SH 1	Northland and Auckland	69.679	6	11	LM	MH	3	15	LM	MH	1	10	L	M
SH 14 from Whangarei to Dargaville	Northland and Auckland	49.391	3	15	M	MH	8	12	M	H	2	9	LM	LM
SH 15A Marsden Point	Northland and Auckland	8.460	1	0	L	LM	1	1	LM	MH	0	3	M	M
SH 16 from Helensville to West Harbour (SH 18)	Northland and Auckland	32.128	7	21	H	LM	3	17	MH	L	6	19	MH	M
SH 16 from Parnell to Hobsonville	Northland and Auckland	38.478	7	35	H	L	5	25	MH	L	3	35	H	L
SH 16 from Wellsford to Helensville	Northland and Auckland	57.332	6	12	M	M	2	17	M	H	6	23	MH	H
SH 18 (Upper Harbour Highway)	Northland and Auckland	24.004	1	9	H	M	1	0	L	L	0	1	L	L
SH 20 and SH 20A and SH 20B	Northland and Auckland	48.803	3	35	H	L	3	11	M	L	2	30	MH	L
SH 22 from Drury to Pukekohe	Northland and Auckland	13.364	4	17	H	M	5	7	H	L	2	11	H	M
SH 17 Albany to Silverdale	Northland and Auckland	0.000	15	3	H	M	24	6	H	M			N/A	N/A
SH 1 from Takanini to Pokeno	Northland and Auckland/ Waikato and Bay of Plenty	48.734	6	17	M	L	3	14	M	L	3	6	L	L
SH 1 from Cambridge to Piarere (SH 29)	Waikato and Bay of Plenty	16.316	4	14	H	L	6	12	MH	L	4	9	MH	L
SH 1 from Hamilton to Cambridge	Waikato and Bay of Plenty	40.027	3	14	H	L	2	11	MH	L	2	6	M	L
SH 1 from Huntly to Hamilton	Waikato and Bay of Plenty	52.276	9	18	H	L	11	30	H	LM	1	7	LM	L
SH 1 from Meremere to Rangiriri	Waikato and Bay of Plenty	28.236	9	13	H	LM	1	2	L	L	2	5	LM	L
SH 1 from Piarere to Putaruru	Waikato and Bay of Plenty	18.802	4	8	MH	LM	6	11	H	M	4	1	LM	L
SH 1 from Pokeno to Meremere	Waikato and Bay of Plenty	24.450	2	5	M	L	1	5	LM	L	1	5	LM	L
SH 1 from Putaruru to Tokoroa	Waikato and Bay of Plenty	25.812	6	7	MH	L	10	9	MH	M	4	6	M	L
SH 1 from Rangiriri to Huntly	Waikato and Bay of Plenty	23.899	4	4	M	L	2	3	LM	L	2	7	M	L
SH 1 from SH 5 (Taupo) to Turangi	Waikato and Bay of Plenty	48.647	13	9	MH	LM	7	14	MH	LM	2	10	LM	L
SH 1 from Tokoroa to SH 5 (Taupo)	Waikato and Bay of Plenty	66.301	11	30	MH	M	7	25	MH	LM	8	13	LM	L
SH 1B from Taupiri to Cambridge	Waikato and Bay of Plenty	43.182	3	9	LM	LM	7	10	M	LM	4	10	M	M

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			Crashes		KiwiRAP Risk		Crashes		KiwiRAP Risk		Crashes		KiwiRAP Risk	
			Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal
SH 2 from Katikati to Tauranga	Waikato and Bay of Plenty	35.918	9	19	H	LM	5	27	H	LM	12	22	H	LM
SH 2 from Mangatarata (SH 25) to Paeroa	Waikato and Bay of Plenty	37.984	6	12	MH	M	3	10	M	L	2	11	M	L
SH 2 from Matata to Opotiki	Waikato and Bay of Plenty	78.481	7	14	LM	M	10	21	M	H	7	11	LM	M
SH 2 from Mount Maunganui (SH 29) to Paengaroa (SH 33)	Waikato and Bay of Plenty	42.323	12	22	H	M	8	15	H	L	0	0	L	L
SH 2 from Paeroa to Katikati	Waikato and Bay of Plenty	45.063	8	40	H	MH	8	23	MH	M	4	17	MH	L
SH 2 from Pokeno (SH 1) to Mangatarata (SH 25)	Waikato and Bay of Plenty	32.553	18	37	H	MH	12	16	H	LM	7	15	MH	L
SH 2 from SH 33 to Matata	Waikato and Bay of Plenty	34.125	5	9	M	LM	1	2	L	L	5	11	M	LM
SH 23 from Hamilton to Raglan	Waikato and Bay of Plenty	40.069	4	19	MH	M	1	23	MH	M	3	18	MH	M
SH 24 and SH 28 from Matamata to Putaruru	Waikato and Bay of Plenty	35.504	1	8	LM	M	1	8	LM	M	3	6	LM	LM
SH 25 from Mangatarata (SH 2) to Thames	Waikato and Bay of Plenty	30.292	0	13	MH	M	0	7	LM	L	4	11	MH	M
SH 25 from Thames to Whitianga via Coromandel	Waikato and Bay of Plenty	95.324	5	9	L	M	4	12	LM	M	3	11	L	M
SH 25 from Whitianga to Waihi	Waikato and Bay of Plenty	105.693	3	17	LM	M	3	29	LM	M	5	24	LM	M
SH 25A from Kopu to Hikuai	Waikato and Bay of Plenty	28.197	4	6	M	M	2	7	LM	M	4	8	M	M
SH 26 from Hamilton to Morrinsville	Waikato and Bay of Plenty	27.884	0	9	M	L	3	10	MH	M	7	7	MH	M
SH 26 from Morrinsville to Kopu	Waikato and Bay of Plenty	68.797	4	11	LM	LM	6	13	M	M	5	8	LM	L
SH 27 from Mangatarata (SH 2) to Tirau	Waikato and Bay of Plenty	92.403	14	32	M	M	13	20	M	LM	4	26	LM	L
SH 29 from Kaimai Ranges to Tauranga	Waikato and Bay of Plenty	36.764	9	18	MH	M	4	29	H	M	8	22	MH	M
SH 29 from Piarere to the Kaimai Ranges	Waikato and Bay of Plenty	23.782	2	7	M	LM	4	4	M	L	3	10	MH	M
SH 29A and SH 2 within Tauranga	Waikato and Bay of Plenty	30.253	4	13	H	LM	4	9	MH	L	3	14	MH	L
SH 3 from Hamilton to Te Awamutu and SH 21	Waikato and Bay of Plenty	30.360	5	15	MH	LM	3	14	MH	L	4	18	MH	M
SH 3 from Te Awamutu to Te Kuiti	Waikato and Bay of Plenty	60.152	8	24	MH	M	3	18	M	LM	4	10	LM	L
SH 30 and SH 33 from Rotorua to Paengaroa	Waikato and Bay of Plenty	40.801	9	20	MH	MH	9	15	MH	M	3	12	M	LM
SH 30 from Rotorua (Te Ngae) to Whakatane	Waikato and Bay of Plenty	70.297	8	35	MH	MH	7	25	M	M	3	24	M	M
SH 30 from Rotorua to Atiamuri	Waikato and Bay of Plenty	31.818	0	9	LM	M	5	6	LM	MH	2	3	L	L
SH 30 from Te Kuiti to Atiamuri	Waikato and Bay of Plenty	105.108	3	18	LM	H	6	12	L	H	3	10	L	MH
SH 31 from Kawhia to SH 39	Waikato and Bay of Plenty	42.628	1	5	L	H	0	10	LM	H	0	4	L	H
SH 32 from Tokoroa to Kuratau	Waikato and Bay of Plenty	94.660	0	7	L	LM	3	8	L	M	3	9	L	MH
SH 34 from Edgecumbe (SH 2) to Kawerau (SH 30)	Waikato and Bay of Plenty	25.199	5	6	M	MH	2	11	MH	H	0	9	M	MH
SH 36 Tauranga to Ngongotaha	Waikato and Bay of Plenty	48.644	1	17	M	MH	1	21	MH	H	3	12	LM	LM
SH 37 from SH 3 to Waitomo Caves	Waikato and Bay of Plenty	7.272	1	5	MH	H	0	3	M	H	0	2	LM	H
SH 38 from Rainbow Mountain to Murupara	Waikato and Bay of Plenty	36.546	2	8	LM	MH	0	10	LM	MH	0	3	L	L
SH 39 from Te Rapa to Otorohanga	Waikato and Bay of Plenty	66.582	6	24	M	MH	9	13	LM	M	4	16	LM	M
SH 5 from Rotorua to Wairakei	Waikato and Bay of Plenty	69.770	9	21	M	LM	10	19	M	LM	6	20	M	L
SH 5 from Tirau to Rotorua	Waikato and Bay of Plenty	45.769	12	23	MH	MH	2	16	M	L	5	15	M	L
SH 5 from Taupo to Tarawera	Waikato and Bay of Plenty/ Gisborne and Hawke's Bay	61.957	7	15	M	M	6	14	LM	LM	1	7	L	L
SH 1 from Turangi to Waiouru	Waikato and Bay of Plenty/ Taranaki, Manawatu-Whanganui and Wellington	61.522	5	12	LM	LM	9	17	M	M	4	18	M	M
SH 2 from Opotiki to Gisborne via Waioeka Gorge	Gisborne and Hawke's Bay/ Waikato and Bay of Plenty	138.253	12	26	LM	H	10	15	L	MH	5	18	L	M

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			Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal
SH 2 from Bay View to Napier	Gisborne and Hawke's Bay	13.189	4	10	H	H	1	4	M	L	3	7	H	M
SH 2 from Gisborne to Wairoa	Gisborne and Hawke's'Bay	89.574	7	22	M	MH	5	22	LM	H	4	21	LM	MH
SH 2 from Napier to Hastings	Gisborne and Hawke's Bay	14.986	6	22	H	MH	3	11	H	LM	2	10	MH	LM
SH 2 from Takapau to Hastings	Gisborne and Hawke's Bay	63.767	13	33	MH	M	10	29	MH	M	6	13	LM	L
SH 2 from Wairoa to SH 5 Napier	Gisborne and Hawke's Bay	103.906	2	26	LM	MH	9	29	M	H	6	18	LM	M
SH 35 from Opotiki to Tokomaru Bay	Gisborne and Hawke's Bay	237.276	10	17	L	MH	8	24	L	H	4	17	L	MH
SH 35 from Tokomaru Bay to Gisborne	Gisborne and Hawke's Bay	90.443	4	13	LM	M	4	18	LM	MH	1	15	L	M
SH 38 from Wairoa to Waikaremoana	Gisborne and Hawke's Bay	64.091	1	2	L	M	0	3	L	H	1	2	L	MH
SH 5 from Tarawera to SH 2 Bay View (North of Napier)	Gisborne and Hawke's Bay	60.490	8	22	M	MH	3	16	LM	M	4	15	LM	M
SH 50 and SH 50A Taradale Rd to Pakipaki	Gisborne and Hawke's Bay	24.071	8	14	H	M	6	9	MH	L	1	17	MH	L
SH 50 from Napier to Takapau	Gisborne and Hawke's Bay	81.687	7	21	M	H	4	6	L	LM	4	9	L	M
SH 3 from Te Kuiti to New Plymouth	Taranaki, Manawatu-Whanganui and Wellington/ Waikato and Bay of Plenty	148.607	13	48	M	MH	15	37	M	M	11	60	M	MH
SH 4 from Eight Mile Junction (Sth of Te Kuiti) to Taumarunui	Taranaki, Manawatu-Whanganui and Wellington/ Waikato and Bay of Plenty	69.651	5	14	LM	MH	2	13	LM	M	3	9	L	LM
SH 41 from Taumaranui to Turangi	Taranaki, Manawatu-Whanganui and Wellington/ Waikato and Bay of Plenty	58.487	0	8	L	MH	5	10	LM	H	2	7	L	MH
SH 46 SH 47 SH 48 from National Park to Turangi	Taranaki, Manawatu-Whanganui and Wellington/ Waikato and Bay of Plenty	72.287	0	5	L	L	2	8	L	MH	3	9	L	H
SH 2 from Takapau to Woodville	Taranaki, Manawatu-Whanganui and Wellington/ Gisborne and Hawke's Bay	58.806	4	31	MH	MH	6	20	M	M	1	10	LM	L
SH 1 from Paraparaumu to Levin	Taranaki, Manawatu-Whanganui and Wellington	41.591	15	44	H	M	9	31	H	L	8	29	H	L
SH 1 from Paraparaumu to Paremata	Taranaki, Manawatu-Whanganui and Wellington	41.685	11	22	H	L	1	11	M	L	5	7	M	L
SH 1 from Sanson to Levin	Taranaki, Manawatu-Whanganui and Wellington	48.679	3	22	MH	LM	3	18	M	L	3	16	M	L
SH 1 from Waiouru to Bulls	Taranaki, Manawatu-Whanganui and Wellington	109.767	10	36	M	LM	6	32	M	L	6	25	LM	L
SH 1 from Wellington to Paremata Roundabout	Taranaki, Manawatu-Whanganui and Wellington	48.465	7	31	MH	L	4	32	MH	L	2	32	MH	L
SH 2 from Featherston to Masterton	Taranaki, Manawatu-Whanganui and Wellington	35.661	4	15	MH	M	2	10	MH	L	0	6	LM	L
SH 2 from Featherston to Upper Hutt	Taranaki, Manawatu-Whanganui and Wellington	25.901	2	18	MH	MH	2	32	H	H	3	13	MH	M
SH 2 from Wellington to Upper Hutt	Taranaki, Manawatu-Whanganui and Wellington	55.836	11	40	H	L	4	34	MH	L	4	40	MH	L
SH 2 from Woodville to Masterton	Taranaki, Manawatu-Whanganui and Wellington	81.414	8	16	M	M	7	22	M	M	6	17	LM	M
SH 3 and 3A from New Plymouth and Waitara to Hawera	Taranaki, Manawatu-Whanganui and Wellington	82.425	9	29	MH	LM	11	32	MH	LM	9	33	MH	LM
SH 3 and SH 1 from Whanganui to Palmerston North	Taranaki, Manawatu-Whanganui and Wellington	68.421	10	36	MH	M	11	23	MH	L	8	24	MH	L
SH 3 from Hawera to Whanganui	Taranaki, Manawatu-Whanganui and Wellington	85.113	8	29	M	M	6	16	LM	LM	6	18	LM	LM
SH 3 from Palmerston North to Woodville	Taranaki, Manawatu-Whanganui and Wellington	23.999	3	11	MH	LM	3	15	MH	M	3	9	MH	L
SH 4 from Raetihi to Whanganui	Taranaki, Manawatu-Whanganui and Wellington	90.695	7	22	LM	H	3	9	L	M	2	10	L	M
SH 4 from Taumarunui to Raetihi	Taranaki, Manawatu-Whanganui and Wellington	69.080	2	22	M	H	4	17	LM	MH	2	13	LM	M

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			Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal
SH 43 from Stratford to Taumarunui	Taranaki, Manawatu-Whanganui and Wellington	148.787	2	5	L	M	5	10	L	H	1	8	L	H
SH 45 from New Plymouth to Hawera	Taranaki, Manawatu-Whanganui and Wellington	98.733	5	11	LM	LM	6	15	LM	LM	5	13	LM	LM
SH 49 from SH 4 to Waiouru	Taranaki, Manawatu-Whanganui and Wellington	36.152	1	5	L	M	0	2	L	L	1	2	L	L
SH 53 from Featherston to Martinborough	Taranaki, Manawatu-Whanganui and Wellington	17.713	1	3	LM	MH	0	2	L	LM	0	4	LM	MH
SH 54 from Feilding to SH 3 Palmerston North	Taranaki, Manawatu-Whanganui and Wellington	13.542	4	9	H	MH	0	8	MH	M	3	6	MH	M
SH 54 from Vinegar Hill (SH 1) to Feilding	Taranaki, Manawatu-Whanganui and Wellington	44.640	2	7	LM	H	0	3	L	L	0	1	L	L
SH 56 from Makerua (SH 57) to Palmerston North	Taranaki, Manawatu-Whanganui and Wellington	22.387	6	5	MH	M	5	9	MH	M	4	8	MH	M
SH 57 from Levin to Ashhurst	Taranaki, Manawatu-Whanganui and Wellington	63.561	8	33	MH	MH	12	28	MH	MH	5	23	M	M
SH 58 from Porirua to SH 2 Upper Hutt	Taranaki, Manawatu-Whanganui and Wellington	14.385	5	15	H	M	2	12	H	LM	2	14	H	M
SH 1 Christchurch Northern Motorway	Tasman, Nelson, Marlborough, West Coast and Canterbury	18.895	2	2	LM	L	3	3	LM	L	1	6	M	L
SH 1 from Ashburton to Timaru	Tasman, Nelson, Marlborough, West Coast and Canterbury	70.859	6	13	LM	L	5	21	M	L	9	11	LM	L
SH 1 from Blenheim to Kaikoura	Tasman, Nelson, Marlborough, West Coast and Canterbury	129.160	14	33	M	MH	5	27	LM	M	6	21	LM	LM
SH 1 from Christchurch to Ashburton	Tasman, Nelson, Marlborough, West Coast and Canterbury	71.292	9	25	M	L	10	36	MH	L	9	36	MH	L
SH 1 from Kaikoura to Waipara	Tasman, Nelson, Marlborough, West Coast and Canterbury	123.294	13	36	M	MH	5	46	M	MH	7	23	LM	LM
SH 1 from Picton to Blenheim	Tasman, Nelson, Marlborough, West Coast and Canterbury	27.449	5	13	MH	M	4	13	MH	M	0	5	LM	L
SH 1 from SH 74 to SH 73 Christchurch	Tasman, Nelson, Marlborough, West Coast and Canterbury	13.880	2	8	H	L	1	7	MH	L	1	9	MH	L
SH 1 from Waipara to Kaiapoi	Tasman, Nelson, Marlborough, West Coast and Canterbury	37.388	6	16	MH	LM	5	14	MH	LM	4	16	MH	L
SH 6 and SH 67 from Murchison to Westport	Tasman, Nelson, Marlborough, West Coast and Canterbury	95.689	5	14	LM	H	3	14	L	MH	2	14	L	MH
SH 6 from Blenheim to Havelock	Tasman, Nelson, Marlborough, West Coast and Canterbury	41.016	4	13	M	M	2	10	LM	L	3	6	LM	L
SH 6 from Greymouth to Haast	Tasman, Nelson, Marlborough, West Coast and Canterbury	318.189	4	25	L	LM	8	26	L	M	6	27	L	LM
SH 6 from Havelock to Nelson	Tasman, Nelson, Marlborough, West Coast and Canterbury	72.649	6	31	M	MH	6	32	MH	MH	8	24	M	MH
SH 6 from Nelson to Murchison	Tasman, Nelson, Marlborough, West Coast and Canterbury	123.430	6	28	LM	M	5	21	LM	M	4	23	LM	L
SH 6 from Westport to Greymouth	Tasman, Nelson, Marlborough, West Coast and Canterbury	93.281	6	10	LM	MH	6	11	L	MH	1	13	L	M
SH 60 from Motueka to Collingwood	Tasman, Nelson, Marlborough, West Coast and Canterbury	83.873	0	24	LM	H	1	13	L	LM	2	17	LM	MH

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			Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal
SH 60 from Richmond to Motueka	Tasman, Nelson, Marlborough, West Coast and Canterbury	30.808	6	17	MH	M	4	5	LM	L	4	7	M	L
SH 62 from Spring Creek (SH 1) to Renwick (SH 6)	Tasman, Nelson, Marlborough, West Coast and Canterbury	12.742	4	2	M	H	2	0	L	L	0	0	L	L
SH 63 from Renwick to Kawatiri	Tasman, Nelson, Marlborough, West Coast and Canterbury	117.168	1	10	L	M	1	14	L	H	1	8	L	M
SH 65 from Ariki (SH 6) to Springs Junction	Tasman, Nelson, Marlborough, West Coast and Canterbury	71.265	2	6	L	MH	2	8	L	MH	2	8	L	MH
SH 67 and SH 67A from Cape Foulwind (Westport) to Mokihinui	Tasman, Nelson, Marlborough, West Coast and Canterbury	55.732	0	1	L	L	1	3	L	M	0	4	L	L
SH 69 and SH 7 from Inangahua Junction (SH 6) to Greymouth	Tasman, Nelson, Marlborough, West Coast and Canterbury	109.691	2	14	L	MH	2	10	L	LM	3	8	L	LM
SH 7 and SH 7A from Waipara to Hanmer Springs	Tasman, Nelson, Marlborough, West Coast and Canterbury	76.046	6	11	LM	LM	4	13	LM	LM	5	9	L	L
SH 7 from Hanmer Springs to Reefton	Tasman, Nelson, Marlborough, West Coast and Canterbury	128.097	5	16	L	H	3	20	L	H	1	27	LM	H
SH 71 from Kaiapoi to Rangiora	Tasman, Nelson, Marlborough, West Coast and Canterbury	6.399			N/A	N/A			N/A	N/A	1	8	H	M
SH 73 from Christchurch to Darfield	Tasman, Nelson, Marlborough, West Coast and Canterbury	36.454	1	7	LM	L	1	5	LM	L	5	11	M	L
SH 73 from Darfield to Kumara	Tasman, Nelson, Marlborough, West Coast and Canterbury	182.777	4	24	L	M	3	20	L	LM	6	28	L	MH
SH 74 Queen Elizabeth II Drive and Tunnel Road (Christchurch)	Tasman, Nelson, Marlborough, West Coast and Canterbury	10.632			N/A	N/A			N/A	N/A	0	10	MH	L
SH 75 from Christchurch to Akaroa	Tasman, Nelson, Marlborough, West Coast and Canterbury	72.617	2	20	LM	M	4	15	LM	M	3	26	M	M
SH 76 Christchurch Southern Motorway	Tasman, Nelson, Marlborough, West Coast and Canterbury	13.921			N/A	N/A			N/A	N/A	1	2	M	L
SH 77 from Ashburton to Darfield	Tasman, Nelson, Marlborough, West Coast and Canterbury	93.820	1	6	L	L	6	21	LM	H	1	5	L	L
SH 79 from Fairlie to Rangitata	Tasman, Nelson, Marlborough, West Coast and Canterbury	61.052	0	5	L	L	2	5	L	LM	1	5	L	L
SH 8 from Timaru to Fairlie	Tasman, Nelson, Marlborough, West Coast and Canterbury	57.144	2	5	L	L	4	7	LM	M	1	1	L	L
SH 80 from Twizel to Mt Cook	Tasman, Nelson, Marlborough, West Coast and Canterbury	54.677	1	3	L	M	0	3	L	M	0	1	L	L
SH 82 from Kurow to SH 1	Tasman, Nelson, Marlborough, West Coast and Canterbury	71.063	0	2	L	L	0	8	L	H	1	9	L	H
SH 1 from Timaru to Oamaru	Tasman, Nelson, Marlborough, West Coast and Canterbury/Otago and Southland	77.098	6	27	M	LM	10	20	M	LM	6	9	LM	L

Link Name	Region(s)	Length(km)	2002 - 2006				2007 - 2011				2012 - 2016			
			Crashes		KiwiRAP Risk		Crashes		KiwiRAP Risk		Crashes		KiwiRAP Risk	
			Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal	Fatal	Serious	Collective	Personal
SH 8 from Fairlie to Omarama	Tasman, Nelson, Marlborough, West Coast and Canterbury/Otago and Southland	129.836	4	16	L	M	1	16	L	LM	7	14	L	LM
SH 83 from Omarama to Pukeuri (SH 1)	Tasman, Nelson, Marlborough, West Coast and Canterbury/Otago and Southland	109.389	3	5	L	LM	2	4	L	L	0	5	L	L
SH 6 from Haast to Wanaka	Otago and Southland/ Tasman, Nelson, Marlborough, West Coast and Canterbury	137.893	3	17	L	H	3	19	L	H	3	9	L	M
SH 1 from Dunedin to Mosgiel (SH 87)	Otago and Southland	17.481	4	16	H	LM	0	14	MH	L	1	7	M	L
SH 1 from Gore to Invercargill	Otago and Southland	62.873	8	20	M	M	3	13	LM	L	2	10	LM	L
SH 1 from Invercargill to Bluff	Otago and Southland	27.208	4	9	MH	H	2	6	M	M	2	7	M	M
SH 1 from Milton to Gore	Otago and Southland	93.013	3	28	M	MH	4	23	LM	M	4	14	LM	L
SH 1 from Mosgiel to Milton including SH 86 to Dunedin Airport	Otago and Southland	50.026	5	31	MH	MH	4	19	MH	LM	5	15	M	L
SH 1 from Oamaru to Dunedin	Otago and Southland	106.806	7	73	MH	H	5	34	M	LM	15	29	M	M
SH 6 from Cromwell to Queenstown	Otago and Southland	52.837	2	29	MH	MH	2	9	LM	L	1	20	M	LM
SH 6 from Lumsden to Invercargill	Otago and Southland	75.845	3	20	LM	M	2	13	LM	L	1	12	L	L
SH 6 from Queenstown to Lumsden	Otago and Southland	100.269	1	18	LM	M	3	19	LM	LM	2	7	L	L
SH 6 SH 8B SH84 and SH 8 from Wanaka to Alexandra	Otago and Southland	85.816	2	21	LM	M	0	12	L	L	5	13	LM	L
SH 8 from Alexandra to Milton	Otago and Southland	131.203	6	56	M	H	8	16	L	M	4	27	LM	M
SH 8 from Omarama to Cromwell and SH 8A	Otago and Southland	128.221	1	30	LM	H	2	13	L	LM	3	17	L	M
SH 85 from Alexandra to Palmerston	Otago and Southland	165.089	1	18	L	H	3	8	L	M	0	11	L	M
SH 87 from Kyeburn to Mosgiel	Otago and Southland	114.073	1	9	L	MH	0	14	L	H	0	13	L	H
SH 88 from Dunedin to Port Chalmers	Otago and Southland	7.538			N/A	N/A			N/A	N/A	0	4	MH	M
SH 90 from Raes Junction to Gore	Otago and Southland	59.330	2	8	L	MH	1	6	L	M	1	8	L	M
SH 93 from Clinton to Mataura	Otago and Southland	43.193	0	9	LM	H	2	5	L	MH	1	6	L	MH
SH 94 from Gore to Lumsden	Otago and Southland	61.280	0	3	L	L	1	5	L	LM	2	4	L	LM
SH 94 from Te Anau to Milford Sound	Otago and Southland	119.252	0	25	LM	H	3	18	L	H	2	19	L	H
SH 94 SH 95 SH 97 from Lumsden to Manapouri	Otago and Southland	114.267	1	21	LM	H	5	10	L	M	3	9	L	LM
SH 96 from Mataura to Ohai	Otago and Southland	89.808	2	20	LM	H	2	9	L	M	3	16	LM	H
SH 98 and SH 99 from Dacre (SH 1) to Clifden	Otago and Southland	114.261	3	18	LM	MH	2	15	L	M	3	12	L	M

Appendix

Risk map methodology

Risk Maps – how the sections were identified
To compare the level of risk of crashes between different regions our state highways were divided into road sections (known as links).

When the first KiwiRAP Risk Maps were developed using 2002-2006 fatal and serious crash data, 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 road users, i.e. trips between locations that are understandable and recognisable, such as major towns or major intersections.
3. Links should comprise broadly similar road characteristics along their length, such as traffic volume and, e.g. one lane in each direction without a median barrier.

Where possible, the same links that were developed and used for the first Risk Maps released in 2008 have been used in developing the updated Risk Maps.

The Risk Maps in this report include results for a total of 172 links, and 11,002 kilometres of the state highway network. The links range in length from 6.4 km to 318 km, with an average length of 64 km.

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

Where a link crosses regional boundaries, the kilometres are split between the two regions according to where the boundary lies along the link.

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** and **Personal Risk**. The focus of each is on crashes where people have been killed or seriously injured. The crash statistics used for the calculations are for five-year periods.

The definitions of fatal and serious injuries are:
FATAL INJURIES: A death occurring as the result of injuries sustained in a road crash within 30 days of the crash.

SERIOUS INJURIES: Fractures, concussion, severe cuts or other injury requiring medical treatment or removal to and retention 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.

Collective Risk = $\frac{\text{(fatal crashes + serious injury crashes) / number of years of data}}{\text{length of road section (excl urban sections)}}$

Collective Risk highlights which state highway links have a high number of fatal and serious crashes on them. This 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 road controlling authorities, as this highlights where infrastructure improvements are most likely to be cost effective, and to NZ Police from an enforcement perspective.

However, as stated previously, risk cannot be eliminated through infrastructure improvements alone. The driver or rider 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, and also where drivers and riders may need to take extra care to minimise their risk.

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 danger to each individual using the state highway link being assessed.

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.

Personal Risk shows the likelihood of a driver or rider, on average, being involved in a fatal or serious road crash on a particular stretch of road. Personal Risk is likely to be of most interest to the public, as it shows the risk to road users, as individuals. A risk-aware driver or rider will be better informed and more able 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. In many cases infrastructure improvements on these roads are less likely to be cost effective and other Safe System interventions such as Safer Road Use and Safe Speeds need to be explored.

How are the various levels of risk defined?

The bands for the different risk levels were determined for the first production of KiwiRAP Risk Maps by spreading the number of links equally over the five risk categories.

Many of the higher Collective Risk links are in the higher populated, higher traffic volume regions (such as the upper North Island) where the state highways are more dense with shorter road links. Conversely, some of the higher Personal Risk lengths are in the less populated and less dense regions resulting in longer road links required to meet the required minimum crash number criteria. As a result, the higher Collective Risk links typically are shorter than the higher Personal Risk links resulting in fewer kilometres in the higher Collective Risk bands than in the higher Personal Risk bands.

The risk thresholds for the bands have remained the same in order for comparisons to be made between Risk Map periods.

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+	

Technical information:

The first KiwiRAP Risk Maps were released in 2008 and covered crash data from 2002-2006. Several changes to the state highway links have been made during the subsequent two five-year reporting periods (2007-2011 and 2012-2016), which should be considered when comparing results across periods:

- for median-divided roads, each carriageway is assessed separately, and hence the kilometre length published for that particular link will be longer than the actual road length. Where roads have been upgraded from single to dual carriageway the assessed road length will increase.
- speed limit boundary changes, and minor discrepancies in the crash analysis system data between time periods, will have resulted in minor changes to the published length for some routes.
- realignments and, in some cases, total replacement of routes by new construction have resulted in changes in the published length of some links between time periods.

When the first KiwiRAP Risk Maps were released in 2008, the state highway network was divided into 172 links. Since then some changes have been made to the number of those links, as detailed below.

Changes between 2002-2006 and 2007-2011

- SH 74 from Main North Road to Burwood Road (Canterbury) is no longer included as a link as it is now classed wholly urban.
- SH 2 from Bay View to Napier merged with SH 2B Airport to Taradale Road to become SH 2 from Bay View to Napier (Hawke's Bay)
- SH 1 from Mackays Crossing to Paraparaumu was merged with SH 1 from Pukerua Bay to Mackays Crossing to become SH 1 Pukerua Bay to Paraparaumu (Wellington)
- SH 1 and SH 1A from Albany to Orewa has been replaced with SH 1 from Albany to Twin Tunnels (Auckland) and parts of the previous route have been revoked (SH 1A) or become SH 17.

- SH 1 from Orewa to Warkworth has been replaced with SH 1 from Warkworth to Twin Tunnels (Auckland) and parts of the previous route have become SH 17.

Changes between 2007-2011 and 2012-2016

- Changes due to Waikato Expressway construction:
- SH 1B from Taupiri to Cambridge now ends at the Cambridge Bypass, not Cambridge township.
- SH 1 from Hamilton to Cambridge now includes the Cambridge Bypass which opened in December 2015. The risk scores are calculated (weighted) for both before (2012-2015) and after (2016) opening.
- SH 1 from Cambridge to Piarere (SH 29) begins at the end of the Cambridge Bypass (dual carriageway), not Cambridge township.
- SH 1 from Huntly to Hamilton now follows the alignment of the Waikato Expressway Te Rapa section (opened December 2012). Risk scores for this section are calculated pro-rata based on three years of data since it opened.
- SH 39 from Ngaruawahia to Otorohanga now bypasses Ngaruawahia and begins at the Expressway itself. This section has been renamed SH 39 from Te Rapa to Otorohanga. Risk scores for this section are calculated based on the three years pro rata since the Ngaruawahia Bypass section of the Waikato Expressway opened.

Changes due to Takitimu Drive (Tauranga) becoming a State Highway (SH 29):

- SH 29 and SH 2 within Tauranga. SH 29 has been replaced with SH 29A.
- SH 36 Tauranga to Ngongataha has a new alignment south of the SH 29/SH 29A roundabout. The old section of SH 36 (Pyes Pa Road north of Pyes Pa) has been revoked and removed from this section.
- SH 29 from Kaimai Ranges to Tauranga has been updated with the new section of SH 29 Takitimu Drive which became state highway in August 2015. Risk scores have been calculated (pro rata) across both the old and new sections of highway.

New sections or roads that were not included in previous updates:

- SH 6 from Nelson to Richmond. The Nelson to Richmond section (Whakatu Drive) has been added to the existing site SH 6 from Richmond to Murchison and renamed SH 6 from Nelson to Murchison.
- SH 71 from Kaiapoi to Rangiora (Canterbury).
- SH 74 Queen Elizabeth II Drive and Tunnel Road (Christchurch). This section includes the following two roads: Queen Elizabeth II Drive from Main North Road to Burwood (80km/h) and Tunnel Road from Ferry Road to the Lyttelton Road Tunnel (100km/h). Part of Queen Elizabeth II Drive is currently being upgraded to a median-divided road in conjunction with the construction of the Christchurch Northern Corridor.

- SH 76 Christchurch Southern Motorway. The duplication and extension of this road was completed in December 2012. Crash risk has been calculated pro rata.
- SH 86 from (Allanton) to Momona (Dunedin Airport). This short section of road has been included in the existing site SH 1 from Mosgiel to Milton which has been renamed SH 1 from Mosgiel to Milton including SH 86 to Dunedin Airport.
- SH 88 from Dunedin to Port Chalmers.

Other changes:

- SH 2 from Mount Maunganui (SH 29) to Paengaroa (SH 33) now follows the alignment of the Tauranga Eastern Link (opened August 2015). The crash risk for this section has been calculated using 1 year and 5 months of crash data, noting that there have been no fatal or serious crashes recorded on this length during this time.
- SH 1 from Tokoroa to Taupo. This section now ends at the intersection of SH 5 and the name has been updated to SH 1 from Tokoroa to SH 5 (Taupo).
- SH 1 from Taupo to Turangi. This section now starts at the intersection with SH 5 and the name has been updated to SH 1 from SH 5 (Taupo) to Turangi.
- SH 67 from Westport to Karamea does not go all the way to Karamea (as originally assessed in 2002-2006). This length was updated in the 2007-2011 report; however the name did not change at that time. SH 67A from Westport to Cape Foulwind was also previously excluded from risk mapping. For this crash period both SH 67 and 67A have been combined and renamed SH 67 and SH 67A from Cape Foulwind (Westport) to Mokihinui
- SH 17 Albany to Silverdale is no longer designated state highway and has not been assessed in the 2012-2016 period.