

## 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	$\leq 0.039$	$< 4$	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

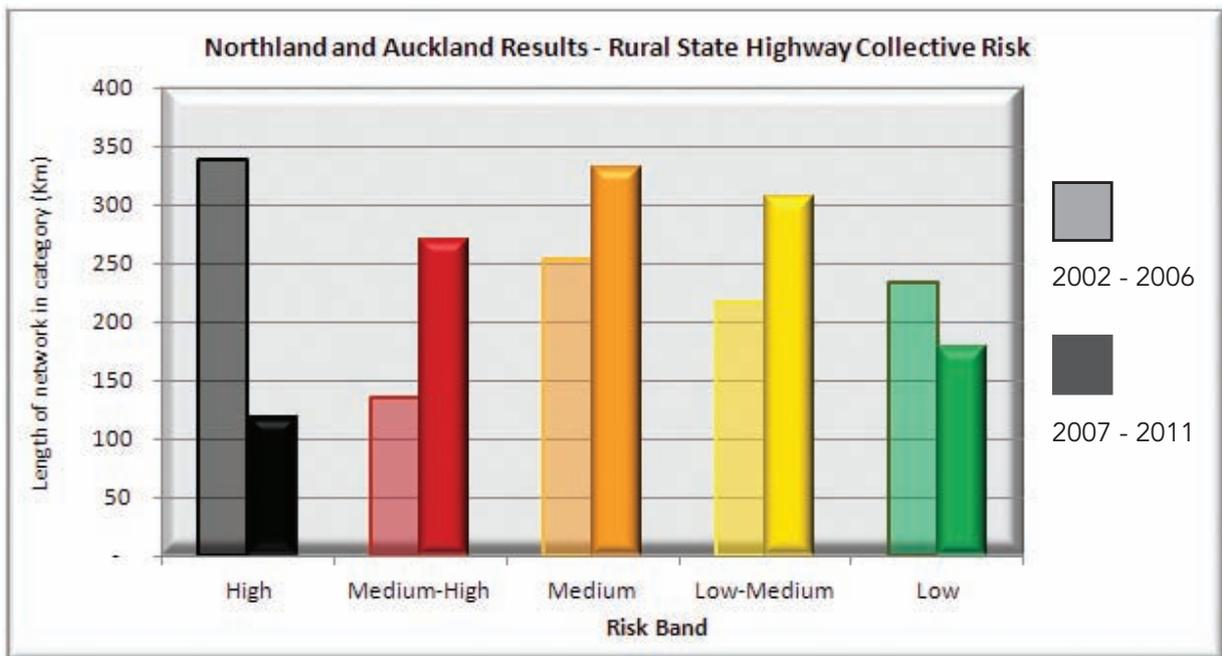
The risk thresholds for the bands have remained the same in order for comparisons to be made between the 2008 Risk Maps (covering crashes in the 2002-2006 period) and the Risk Maps in this report for the 2007-2011 period.

## PERFORMANCE TRACKING FOR NORTHLAND/AUCKLAND REGION

### Collective Risk

There has been a substantial drop in the percentage of kilometres of state highway in the high collective risk category in the Northland/Auckland region between the two time periods (from 29% to 10%). The percentage of the network in medium-high, medium and low-medium collective risk bands have all increased while the percentage of network in the low risk band has decreased from 20% to 15%.

Changes in Collective Risk in Northland/Auckland Region (comparing 2002-2006 data with 2007-2011)



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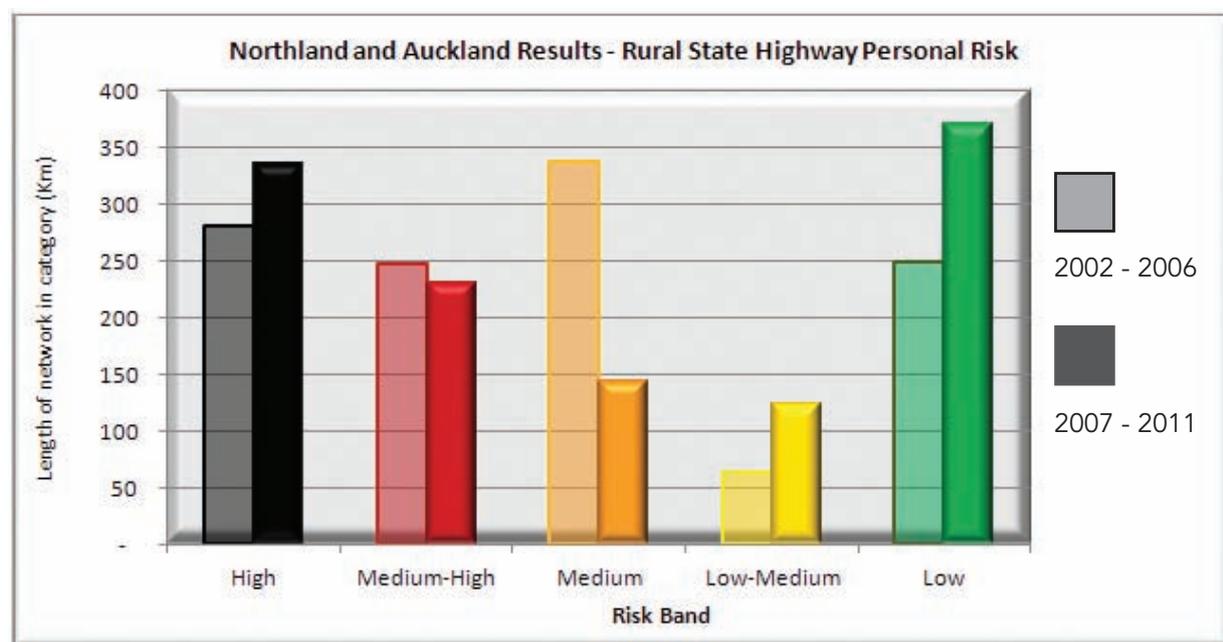
Period		High	Medium-High	Medium	Low-Medium	Low	Total
2002-2006	Percentage	29%	12%	22%	18%	20%	100%
	Length (km)	339	136	254	217	233	1,179
2007-2011	Percentage	10%	22%	28%	25%	15%	100%
	Length (km)	118	270	332	306	178	1,204

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

### Personal Risk

The percentage of state highway network in the high personal risk category in the Northland/Auckland region has increased from 24% to 28%. The percentage of network in the combined low-medium and low collective risk categories has increased by 15%.

Changes in Personal Risk in Northland/Auckland Region (comparing 2002-2006 data with 2007-2011)



Period		High	Medium-High	Medium	Low-Medium	Low	Total
2002-2006	Percentage	24%	21%	29%	5%	21%	100%
	Length (km)	281	248	337	64	249	1,179
2007-2011	Percentage	28%	19%	12%	10%	31%	100%
	Length (km)	335	230	144	125	370	1,204

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

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The table below details how the risk categories of the links in the Northland/Auckland 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
Medium-High	Medium-High	SH 1 Northern Motorway (Auckland to Albany)	Low	Low
High	High	SH 1 from Auckland to Takanini	Low	Low
Low	Low	SH 1 from Cape Reinga to Kaitaia	Medium-High	Medium
Low	Low-Medium	SH 1 from Kaitaia to Ohaeawai	Medium	High
High	Medium-High	SH 1 from Ruakaka to Wellsford	Medium	Low-Medium
High	Medium-High	SH 1 from Marsden Point (SH 15A) to Whangarei	Low-Medium	Low
Medium	Medium	SH 1 from Takanini to Pokeno*	Low	Low
High	High	SH 1 from Warkworth to Wellsford	Medium-High	Medium-High
Medium-High	Medium-High	SH 1 from Whangarei to Ohaeawai	Medium	Low-Medium
Medium	Medium	SH 10 from Awanui to SH 1 South (Pakaraka)	High	Medium-High
Medium-High	Medium	SH 11 from Kawakawa to Puketona (SH 10)	High	Medium-High
Low-Medium	Low-Medium	SH 12 from Dargaville to Ohaeawai	High	High
Low-Medium	Low-Medium	SH 12 from Dargaville to SH 1	Medium-High	Medium-High
Medium	Medium	SH 14 from Whangarei to Dargaville	Medium-High	High
Low	Low-Medium	SH 15A Marsden Point	Low-Medium	Medium-High
High	Medium-High	SH 16 from Helensville to West Harbour (SH 18)	Low-Medium	Low
High	Medium-High	SH 16 from Parnell to Hobsonville	Low	Low
Medium	Medium	SH 16 from Wellsford to Helensville	Medium	High
High	High	SH 17 Albany to Silverdale	Medium	Medium
High	Low	SH 18 Upper Harbour Highway	Medium	Low
High	Medium	SH 20 and SH 20A and SH 20B	Low	Low
High	High	SH 22 from Drury to Pukekohe	Medium	Low

\*This link has changed significantly between the two time periods

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)

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

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

<sup>3</sup>Revoked state highway status in 2012. This link has increased significantly in length from that used in the 2008 Risk Map report due to previous SH 1 portions (between Orewa and twin tunnels) becoming SH 17.

Symbol – : no data.

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## 2012 RISK MAPS FOR NORTHLAND/AUCKLAND REGION

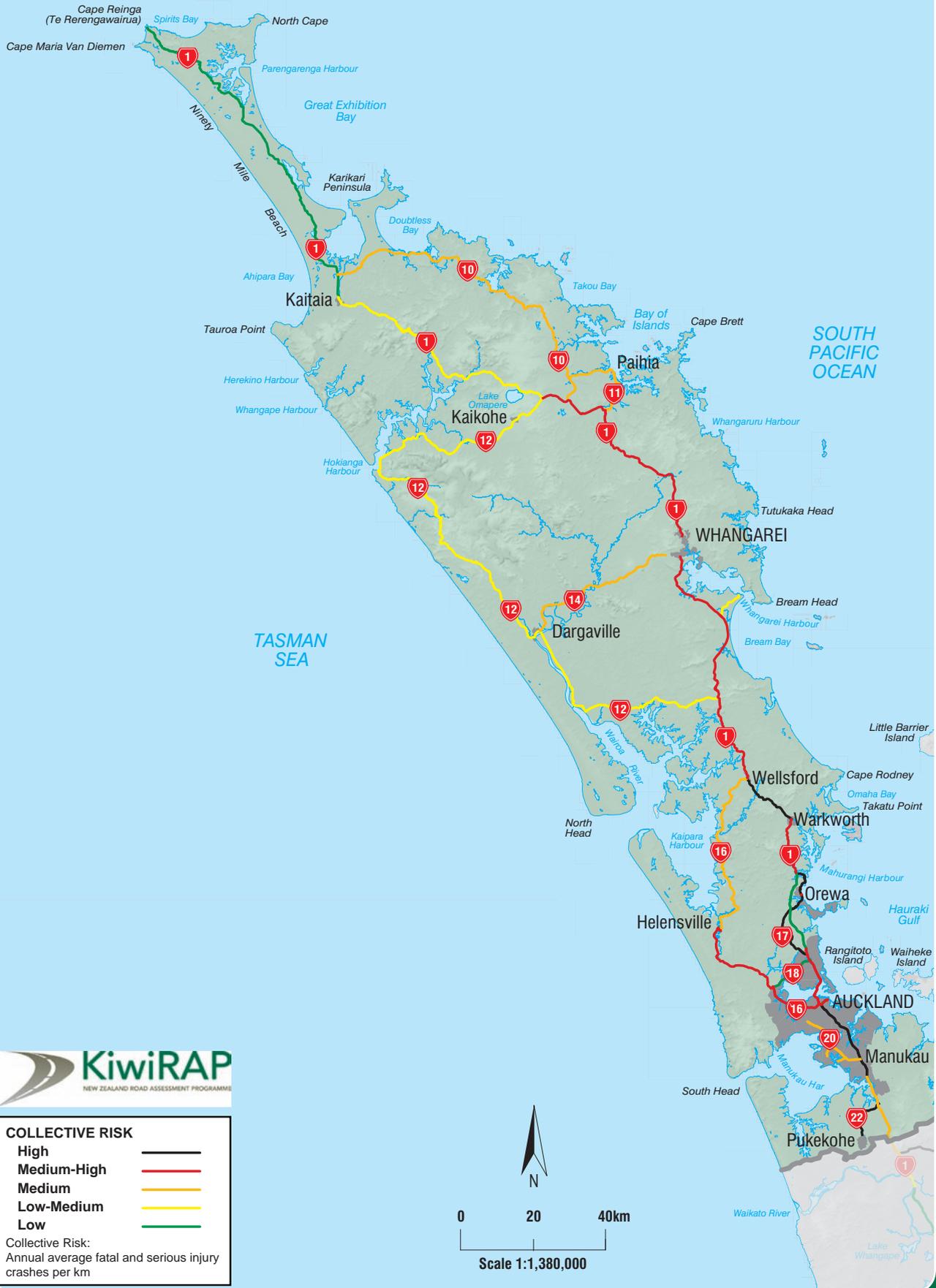
Link	Length <sup>(1)</sup> (km)	Serious Injury Crashes 2007 to 2011	Fatal Crashes 2007 to 2011	Collective Risk Annual average fatal and serious injury crashes per km	Collective Risk Band	Personal Risk Annual average fatal and serious injury crashes per 100 million vehicle-km	Personal Risk Band
SH 1 Northern Motorway (Auckland to Albany)	35.5	30	1	0.18	Medium-High	0.9	Low
SH 1N from Albany to Twin Tunnels	47.3	4	1	0.02	Low	0.4	Low
SH 1N from Auckland to Takanini	50.7	46	8	0.21	High	1.0	Low
SH 1N from Cape Reinga to Kaitaia	109.2	9	2	0.03	Low	6.2	Medium
SH 1N from Kaitaia to Ohaeawai	80.2	21	2	0.06	Low-Medium	10.3	High
SH 1N from Ruakaka to Wellsford	53.9	29	10	0.16	Medium-High	4.8	Low-Medium
SH 1N from SH 15A to Whangarei	24.6	12	5	0.14	Medium-High	3.0	Low
SH 1N from Takanini to Pokeno <sup>(2)</sup>	48.3	14	3	0.07	Medium	0.8	Low
SH 1N from Warkworth to Wellsford	18.7	17	9	0.31	High	7.4	Medium-High
SH 1N from Whangarei to Ohaeawai	70.7	24	14	0.11	Medium-High	4.6	Low-Medium
SH 1N Warkworth to Twin Tunnels	17.4	11	4	0.19	Medium-High	2.9	Low
SH 10 from Awanui to SH 1N south	103.7	36	10	0.10	Medium	7.8	Medium-High
SH 11 from Kawakawa to SH 10	29.6	11	1	0.10	Medium	8.1	Medium-High
SH 12 from Dargaville to Ohaeawai	148.0	21	8	0.04	Low-Medium	10.2	High
SH 12 from Dargaville to SH 1N	69.7	15	3	0.06	Low-Medium	8.1	Medium-High
SH 14 from Whangarei to Dargaville	49.6	12	8	0.09	Medium	9.6	High
SH 15A	8.6	1	1	0.05	Low-Medium	8.0	Medium-High
SH 16 from Helensville to SH 18	30.5	17	3	0.16	Medium-High	3.8	Low
SH 16 from Parnell to Hobsonville	37.8	25	5	0.17	Medium-High	1.2	Low
SH 16 from Wellsford to Helensville	57.5	17	2	0.07	Medium	11.0	High
SH 17 <sup>(3)</sup>	35.2	24	6	0.21	High	5.8	Medium
SH 18	21.2	-	1	0.02	Low	0.3	Low
SH 20 and SH 20A and SH 20B	49.3	15	3	0.09	Medium	0.8	Low
SH 22 from Drury to Pukekohe	13.0	7	5	0.23	High	3.8	Low

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# NORTHLAND and AUCKLAND REGION



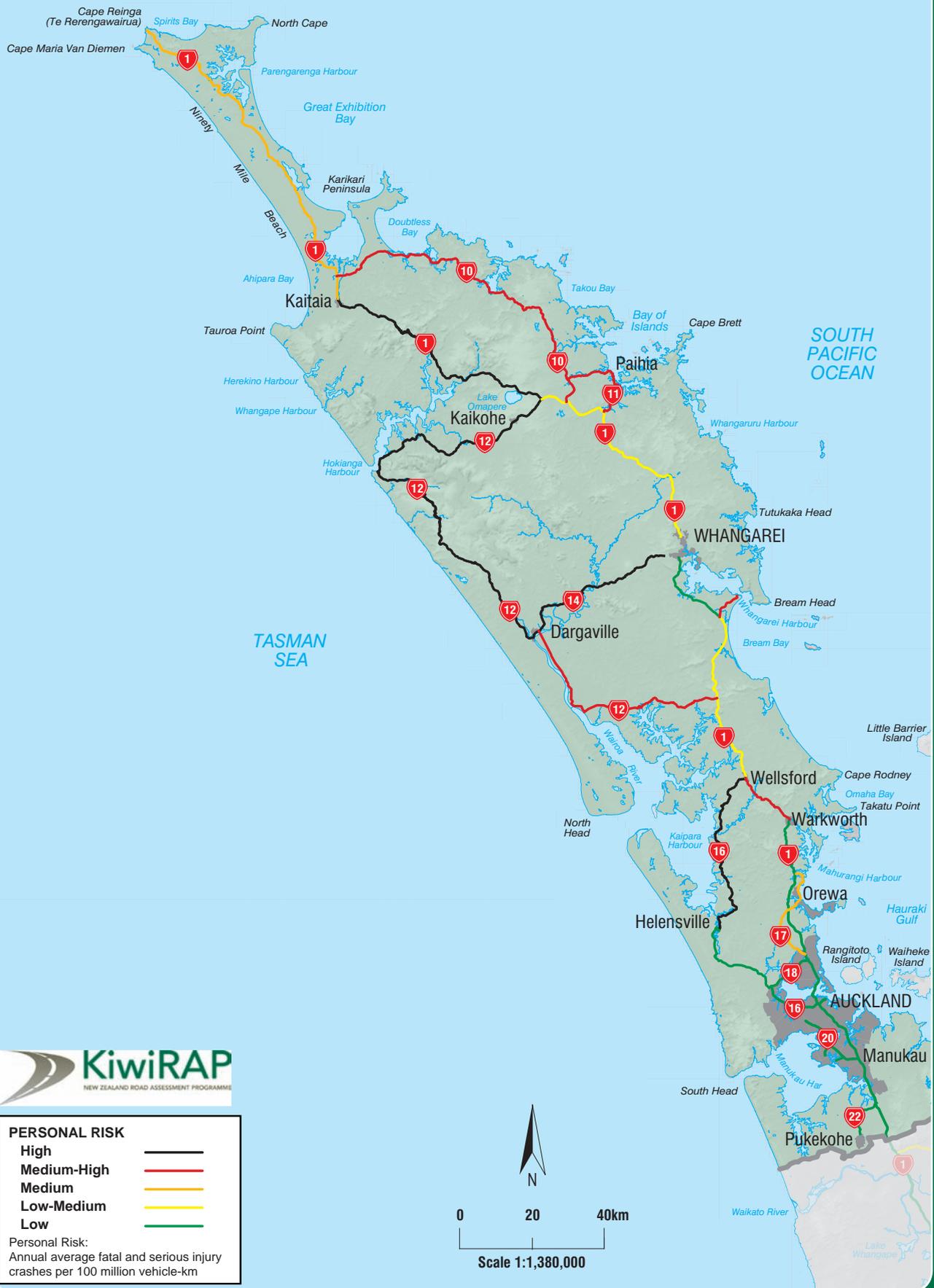
COLLECTIVE RISK MAP

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# NORTHLAND and AUCKLAND REGION



## PERSONAL RISK MAP

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