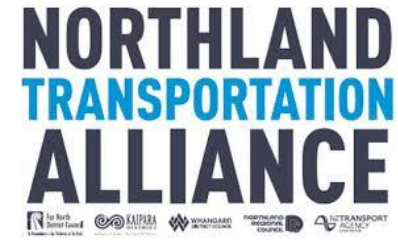


# Programming Tool



Insightful solutions.  
Empowering advice.

# Introductions

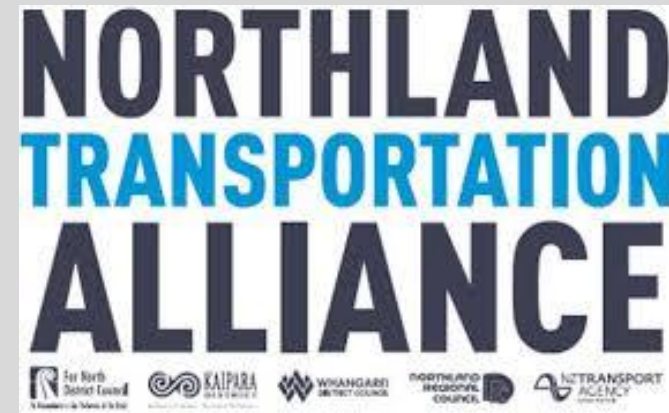
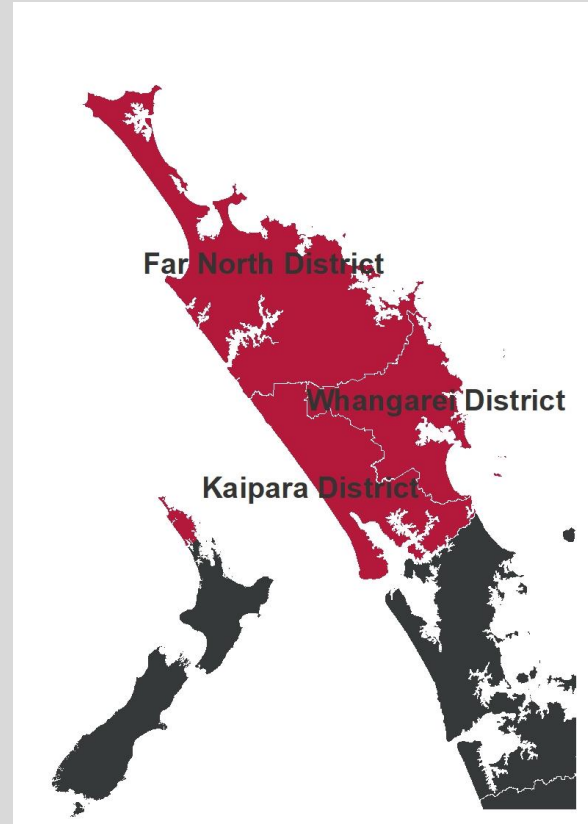


Dwayne Claassen  
Roading Engineer  
Northland Transport Alliance



Bridget Carden  
Senior Transportation Engineer  
Abley

# Introductions



**NORTHLAND TRANSPORTATION ALLIANCE**



# Contents

1. Setting the scene
2. Existing tools
3. The gap / opportunity
4. How the tool was built
5. Tool functionality
6. Next steps

# Northland

- Number of fatalities and serious injuries happening on our roads is increasing
- Predominantly rural based roading network:
  - Lower population numbers
  - Smaller isolated communities
  - Lower Socioeconomic populations
- Funding Criteria – Results Alignment, Cost-Benefit Appraisals
- Programme Management – Tight timeframes, limited budgets, strong political influence.



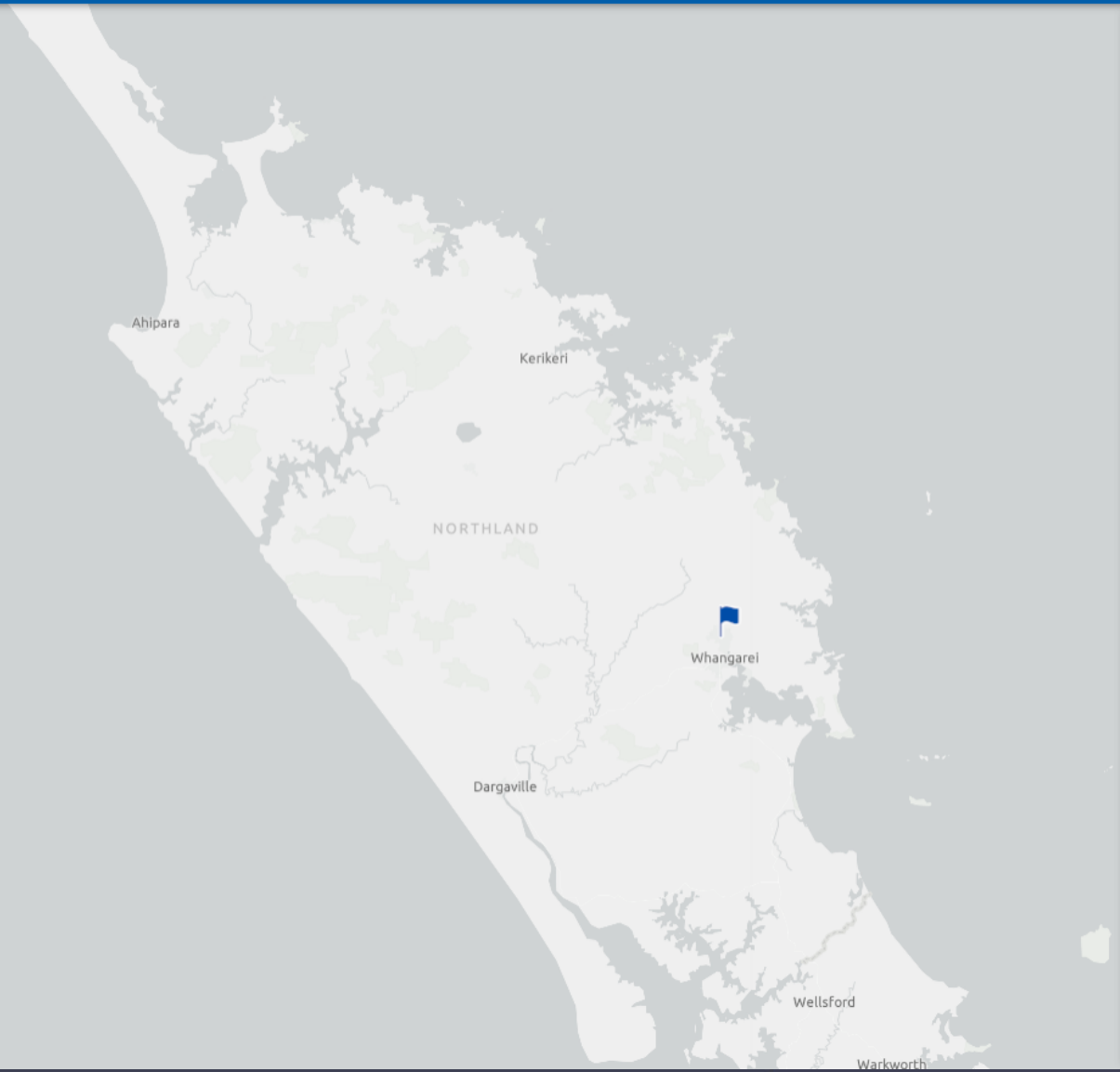
# Barriers to programme development

- Development of Low/Cost Low Risk programmes based on programme level business cases
- Demonstrates strategic alignment and alternative options
- Demonstrate clear rationale
- Most effective response to the problem

# Existing tools



Map navigation controls including zoom in (+), zoom out (-), home, and search (Find address or place) buttons.



### Crash Filter

Select from the options below to filter the injury crashes layer.

Leaving all options in a group unselected will result in them all being included in the filter.

<b>Filter by Severity</b>	<b>Filter by Movements</b>
<input type="checkbox"/> Fatal	<input type="checkbox"/> Head On
<input type="checkbox"/> Serious	<input type="checkbox"/> Run Off Road
<input type="checkbox"/> Minor	<input type="checkbox"/> Intersection
<input type="checkbox"/> Non Injury	<input type="checkbox"/> Other
<b>Filter by Users</b>	<b>Filter by Factors</b>
<input type="checkbox"/> Car	<input type="checkbox"/> Speed
<input type="checkbox"/> Motorcycle	<input type="checkbox"/> Alcohol
<input type="checkbox"/> Heavy Vehicle	<input type="checkbox"/> Failed to Give Way
<input type="checkbox"/> Bicycle	<input type="checkbox"/> Distracted
<input type="checkbox"/> Pedestrian	<input type="checkbox"/> Other
<input type="checkbox"/> Other	
<b>Day / Night</b>	<b>Dry / Wet</b>
<input type="checkbox"/> Day	<input type="checkbox"/> Dry
<input type="checkbox"/> Night	<input type="checkbox"/> Wet
<b>From</b>	<b>To</b>
2008	2018

**Load** **Clear**

2018 crashes to 31 March.

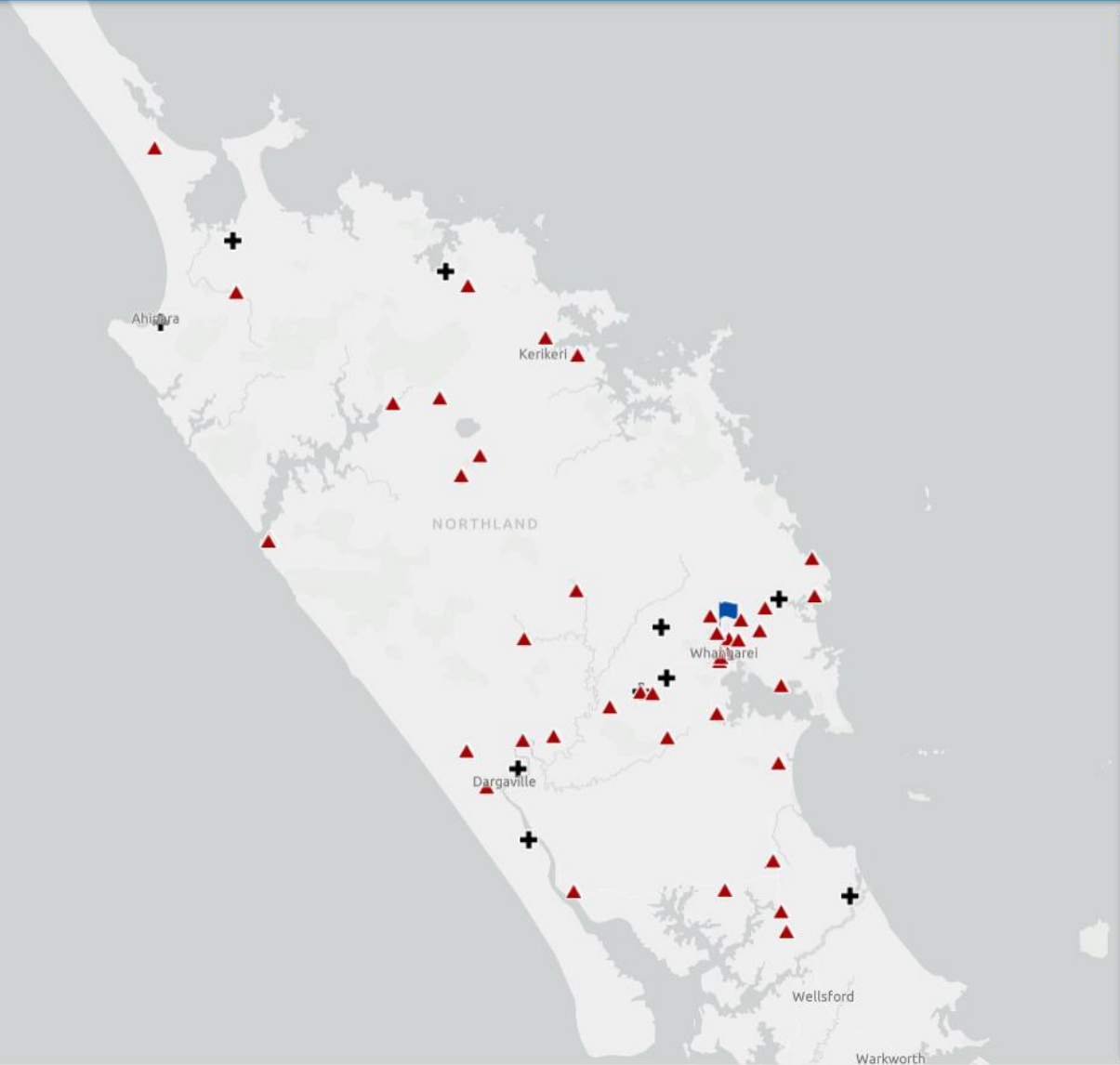
Performance Tracking Report

# NORTHLAND TRANSPORTATION ALLIANCE





Map navigation controls including zoom in (+), zoom out (-), home, and search bar with text "Find address or place".



**Crash Filter**

Select from the options below to filter the injury crashes layer.

Leaving all options in a group unselected will result in them all being included in the filter.

---

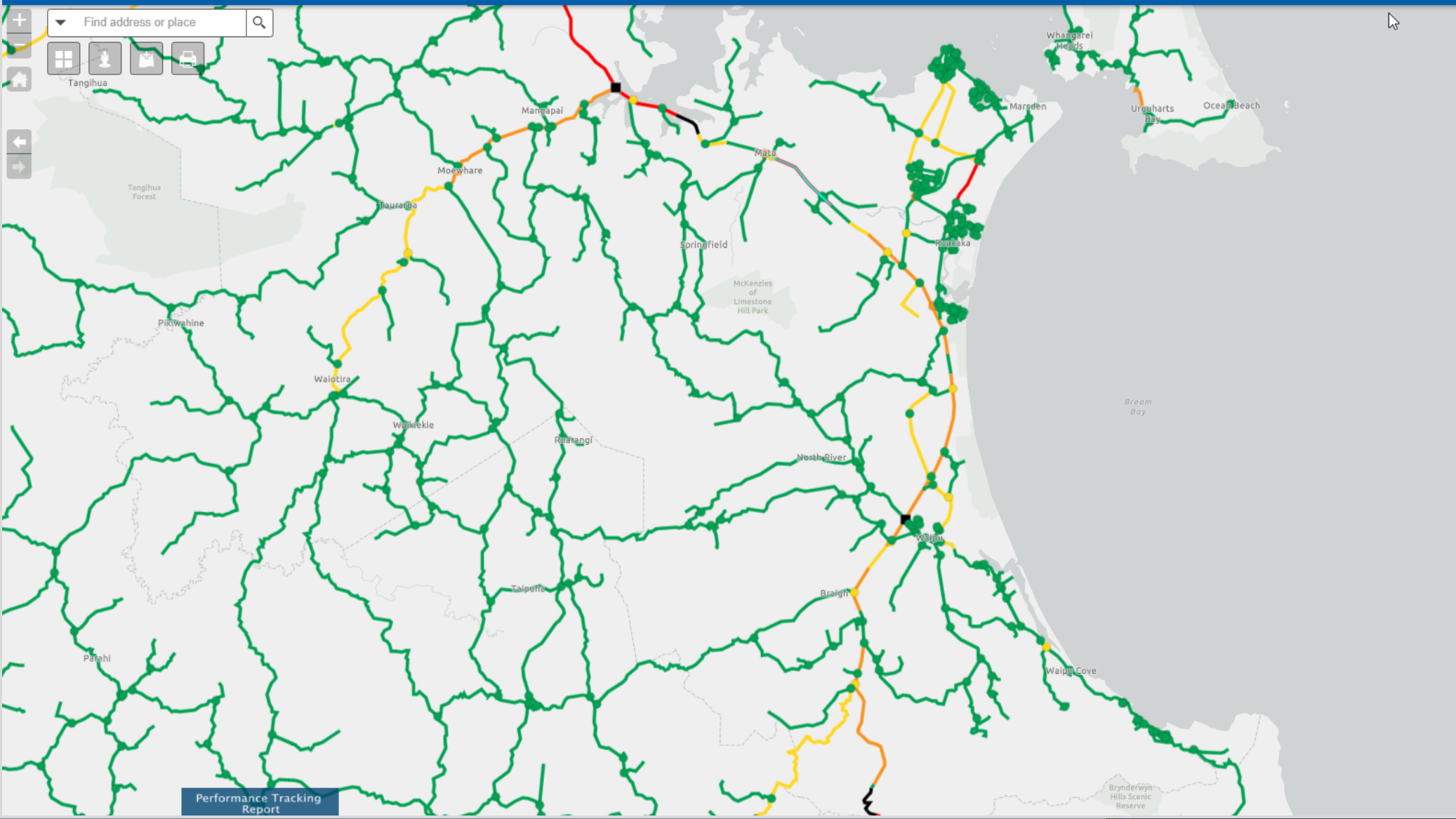
<b>Filter by Severity</b>	<b>Filter by Movements</b>
<input checked="" type="checkbox"/> Fatal	<input type="checkbox"/> Head On
<input checked="" type="checkbox"/> Serious	<input checked="" type="checkbox"/> Run Off Road
<input type="checkbox"/> Minor	<input type="checkbox"/> Intersection
<input type="checkbox"/> Non Injury	<input type="checkbox"/> Other
<b>Filter by Users</b>	<b>Filter by Factors</b>
<input checked="" type="checkbox"/> Car	<input checked="" type="checkbox"/> Speed
<input type="checkbox"/> Motorcycle	<input type="checkbox"/> Alcohol
<input type="checkbox"/> Heavy Vehicle	<input type="checkbox"/> Failed to Give Way
<input type="checkbox"/> Bicycle	<input type="checkbox"/> Distracted
<input type="checkbox"/> Pedestrian	<input type="checkbox"/> Other
<input type="checkbox"/> Other	
<b>Day / Night</b>	<b>Dry / Wet</b>
<input type="checkbox"/> Day	<input type="checkbox"/> Dry
<input type="checkbox"/> Night	<input checked="" type="checkbox"/> Wet
<b>From</b>	<b>To</b>
2008	2018

**Load** **Clear**

2018 crashes to 31 March.

Performance Tracking Report

# NORTHLAND TRANSPORTATION ALLIANCE

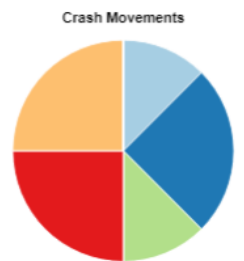


Performance Tracking Report

CrashBoard

Select a corridor or intersection to generate 2013-2017 crash statistics

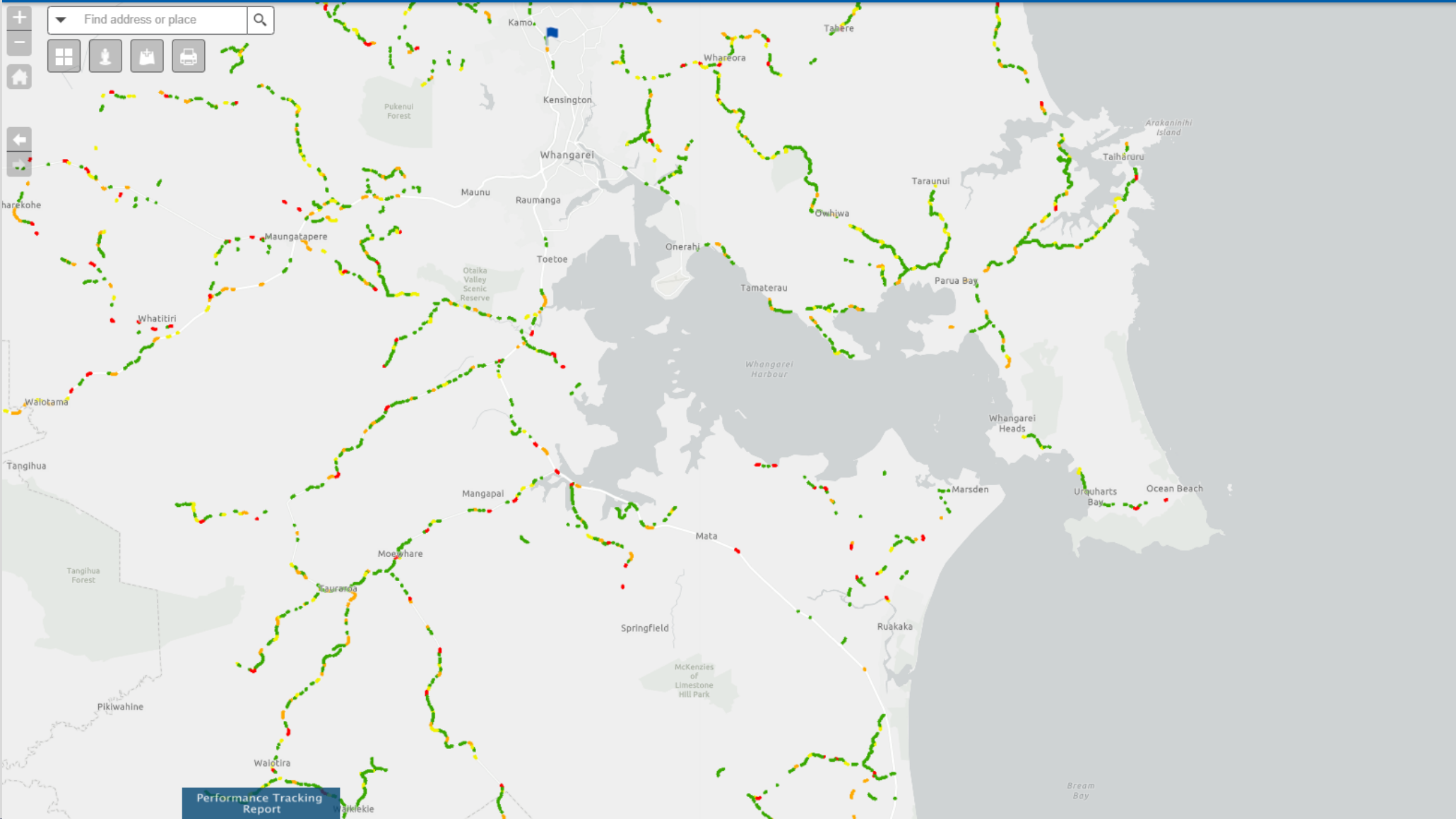
Collective Risk  
**Medium High**  
 Personal Risk  
**Medium**



Total Injury Crashes  
**8**  
 Fatal and Serious Crashes  
**3**



2018 crashes to 31 March.



### Layer List

Operational layers

- Crashes (2018 to 31 March) - Not used in analysis
- Crashes (2008-2017)
- Crash Commonalities
- Intersections Collective Risk
- Intersections Personal Risk
- Intersection Level of Safety Service
- Aggregated Corridors Collective Risk
- Aggregated Corridors Personal Risk
- ARU Heatmaps
- Individual Curve Analysis (ACC)
- High Risk Corridors - Curves (NZTA)
- High Benefit Opportunities
- Speed Management Framework (from Megamaps)

Performance Tracking Report

# NORTHLAND TRANSPORTATION ALLIANCE

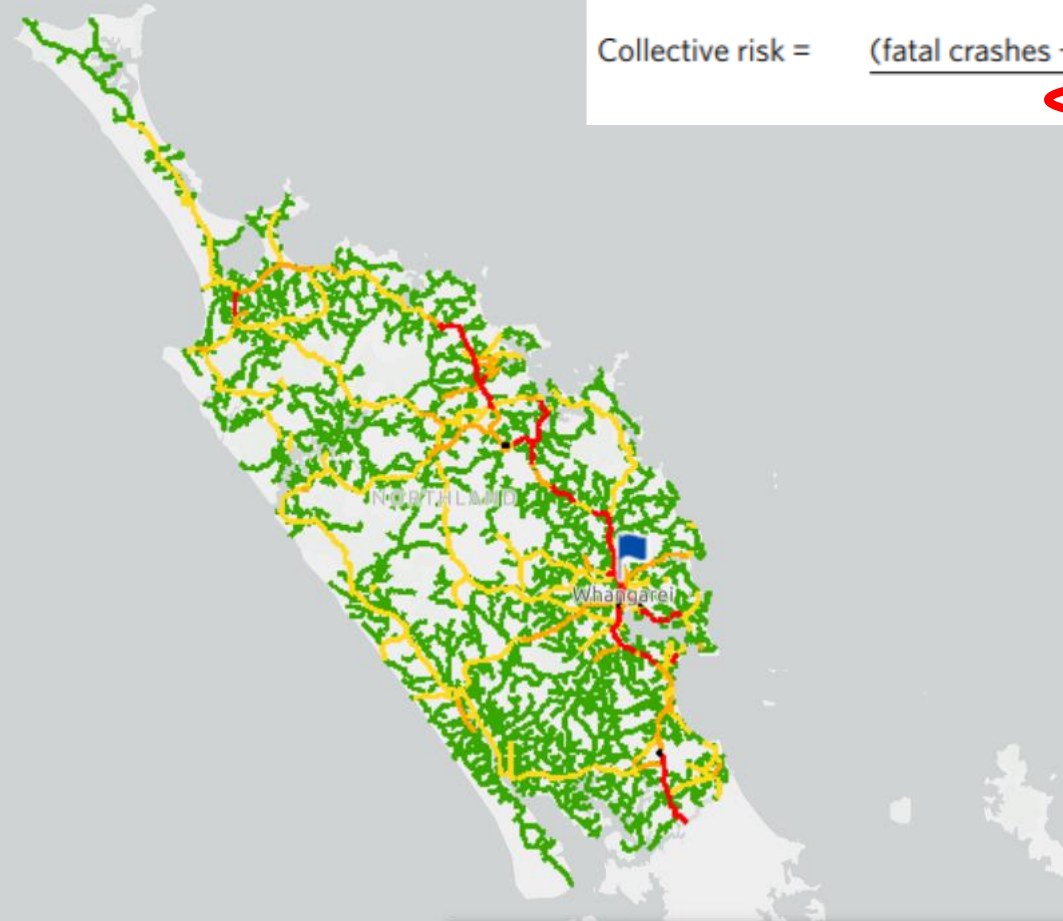
# Why the tool was developed

**NORTHLAND TRANSPORTATION ALLIANCE**





Find address or place



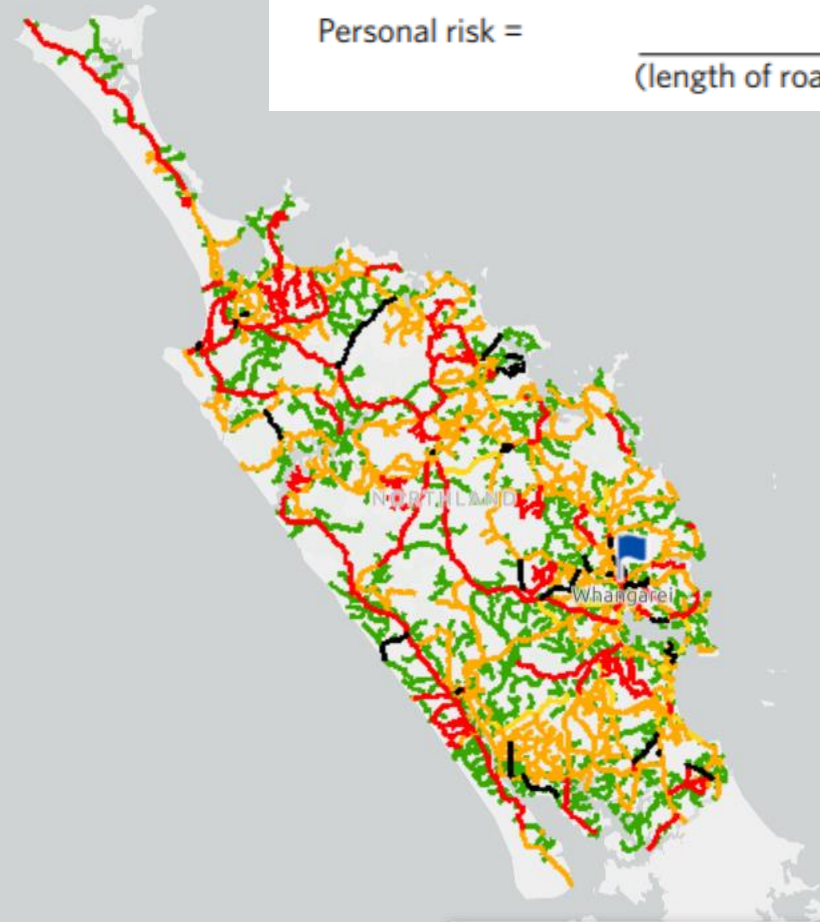
$$\text{Collective risk} = \frac{(\text{fatal crashes} + \text{serious crashes}) / \text{number of years of data}}{\text{Length of road section}}$$

Performance Tracking Report

Layer List

Map navigation controls including zoom in (+), zoom out (-), home, full screen, print, and navigation arrows.

Find address or place



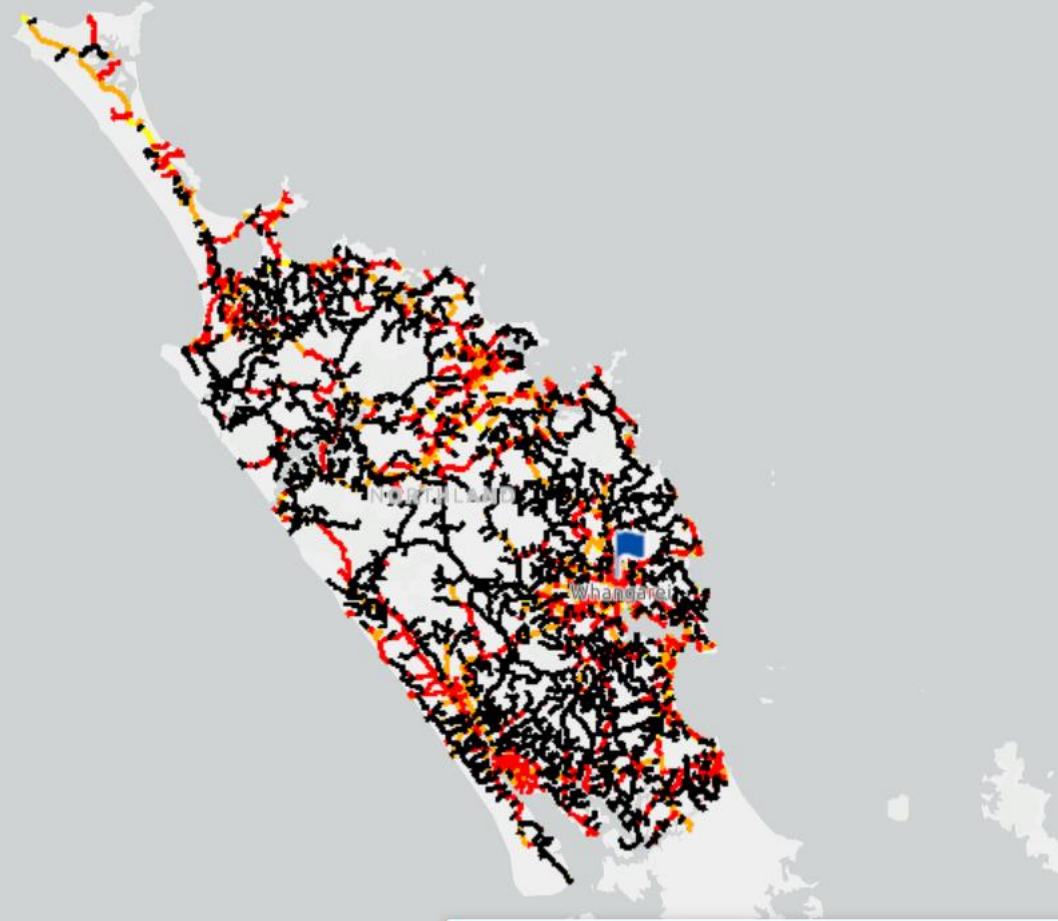
$$\text{Personal risk} = \frac{\text{Fatal crashes} + \text{serious crashes}}{(\text{length of road in km} \times \text{number of years of data} \times 365 \text{ days} \times \text{AADT}) / 10^8}$$

Performance Tracking Report

Layer List



Map navigation controls including zoom in (+), zoom out (-), home, search (Find address or place), and navigation arrows.



Performance Tracking Report

Layer List ⌵ ⌵ ✕

## NORTHLAND TRANSPORTATION ALLIANCE

# Why the tool was developed

- Bridge the gap
- Build programmes that can easily be prioritised
- Simultaneously call on all relevant documentation
- Link existing map packages

**Work Smarter,  
Not Harder.**



<https://me.me/i/work-smarter-not-harder-4916699>

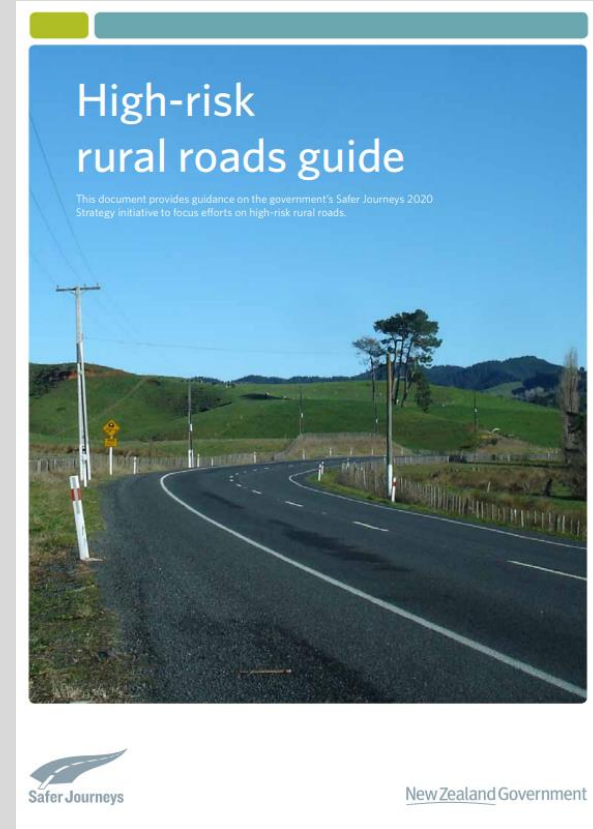
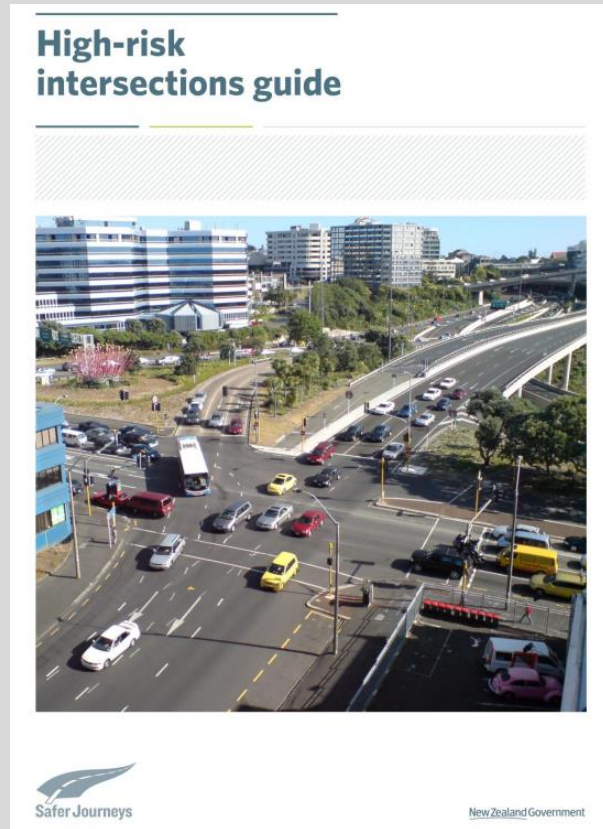
**abley**

**NORTHLAND  
TRANSPORTATION  
ALLIANCE**






# Step 1. Create Database



# Step 1. Create Database

**D2: Wide medians**

**Description** A wide (>9m) grassed traversable median in the centre of the road for errant vehicles to recover



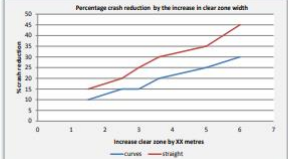
State Highway 11, Tamahere, New Zealand

**Application** Used on rural high traffic volume roads with more than 2 lanes in each direction. A depressed median configuration should be traversable. Median side slopes:

- should preferably be 3:1
- should not exceed 1:1, particularly where a median barrier is installed
- must not exceed 1:6

**Issues** Ongoing mowing and associated traffic management costs; however if planted with frangible vegetation, it could reduce maintenance costs and these could provide a form of protection for errant vehicles. Does not totally eradicate high-speed vehicle conflicts as some vehicles still traverse the whole distance, so a barrier is still desirable. If a barrier is installed the wide space is no longer beneficial from a safety perspective and land cost can be saved.

**Crash reduction** A percentage reduction in crashes by increasing the clear zone width is provided in the figure below: [65]



Increase clear zone by XX metres	Curves (%)	Straight (%)
0	0	0
1	10	15
2	15	20
3	20	25
4	25	30
5	30	35
6	35	40
7	40	45

**Other benefits** Visually more pleasing than a sealed surface with median barrier. Assist with stormwater drainage

**Cost** \$-\$\$


**Treatment life** 5-20 years

**References and guidelines** [65] [99]

NZ Transport Agency | High-risk rural roads guide | September 2011 | 93

**Turning bays** 152

**Description** Right turn and left turn (diverge) bays on the main road to remove turning traffic from conflict with through traffic.



**Application** At T, Y and crossroads intersections where there are high turning volumes leaving the main road or difficult turning due to high through traffic volume on the major road.

**Issues** Care is required as turn bays typically reduce near-end crashes which are of low severity, but in many situations can increase crossing crashes which are most severe.

**Right turn bays:**

- can result in increased crossing crashes at crossroads, as it is more difficult to anticipate oncoming traffic due to the widened intersection, and poorly aligned right turn bays can block visibility of opposing through traffic.
- when introduced on rural curves can result in poor geometry for the through traffic lane, so length of tapers needs to be carefully considered.

**Left turn bays:**

- can result in left-turning traffic masking faster moving through traffic to traffic emerging from the side road. This happens on typical straight main road approaches and is greater on approaches where the side road is on the inside of a curve
- where this is likely to be an issue the left turn bays must be aligned to prevent it, e.g. offset further left, or the left turn lanes not provided.

Both require larger footprint than other simple junction forms.


**Crash reduction** 33% reduction in injury crashes. [15]  
35% reduction in injury crashes. [3]  
However these are low severity rear end crashes that are saved. Fatal and serious crash risk may increase.

**Other benefits** Improved through flow.

**Cost** Medium/high

**Treatment life** 25 years

**Applicable key high-risk crash movement types**




**References** [3] [15] [23]

NZ Transport Agency High-risk intersection guide July 2013 | p.150

# Step 1. Create Database

**D2: Wide medians**

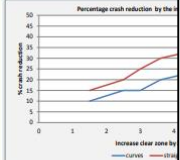
**Description**  
A wide (9-9m) grassed traversable median in the



**Application**  
Used on rural high traffic volume roads with more  
A depressed median configuration should be used  
• should preferably be 0.20  
• should not exceed 1.30, particularly where a  
• must not exceed 1.6

**Issues**  
Ongoing mowing and associated traffic management  
vegetation, it could reduce maintenance costs and  
vehicles.  
Does not totally eradicate high-speed vehicle cost  
distance, so a barrier is still desirable. If a barrier  
a safety perspective and land cost can be saved.

**Crash reduction**  
A percentage reduction in crashes by increasing  
(65)



**Other benefits**  
Visually more pleasing than a sealed surface with  
Assist with stormwater drainage

**Cost**  
\$-\$\$


**Treatment life**  
5-20 years

**References and guidelines**  
[65] [99]

NZ Transport Agency | High-risk rural roads guide | September 2011 | 93

**Turning bays** IS2

**Description**  
Right turn and left turn (diverge) bays on the main road to remove turning traffic from conflict with through traffic.



**Application**  
At T, Y and crossroads intersections where there are high turning volumes leaving the main road or difficulty turning due to high through traffic volume on the major road.

**Issues**  
Care is required as turn bays typically reduce rear-end crashes which are of low severity, but in many situations can increase crossing crashes which are most severe.

**Right turn bays:**

- can result in increased crossing crashes at crossroads, as it is more difficult to anticipate oncoming traffic due to the widened intersection, and poorly aligned right turn bays can block visibility of opposing through traffic
- when introduced on rural curves can result in poor geometry for the through traffic lane, so length of tapered needs to be carefully considered.

**Left turn bays:**

- can result in left-turning traffic making faster moving through traffic to traffic emerging from the side road. This happens on typical straight main road approaches and is greater on approaches where the side road is on the inside of a curve)
- where this is likely to be an issue the left turn bays must be aligned to prevent it, e.g offset further left, or the left turn lanes not provided.

Both require larger footprint than other simple junction forms.


**Crash reduction**  
33% reduction in injury crashes. [10]  
35% reduction in injury crashes. [3]  
However these are low severity rear and crashes that are saved.  
Fatal and serious crash risk may increase.

**Other benefits**  
Improved through flow.

**Cost**  
Medium/high

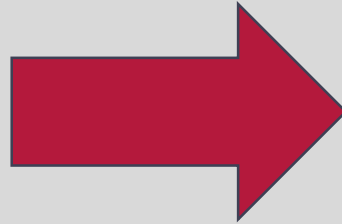
**Treatment life**  
25 years

**Applicable key high-risk crash movement types**



**References**  
[3] [5] [23]

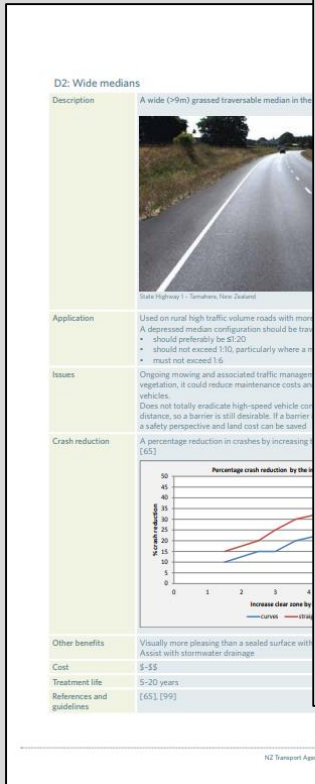
NZ Transport Agency High-risk intersection guide July 2013 p.110



Intervention	
Treatment Philosophy	
Crash type(s) addressed	
Urban / Rural	
Crash reduction potential	
<u>Intersections</u>	<u>Corridors</u>
Control	ONRC
No. of approaches	Road attributes
	AADT
	Road type (divided etc)



# Step 1. Create Database



**D2: Wide medians**

**Description**  
A wide (>9m) grassed traversable median in the road.

**Application**  
Used on rural high traffic volume roads with more than 10,000 vehicles per day. A depressed median configuration should be used where a road width is less than 10m. Must not exceed 1:30, particularly where a median width is less than 1.6m.

**Crash reduction**  
A percentage reduction in crashes by increasing the width of the median.

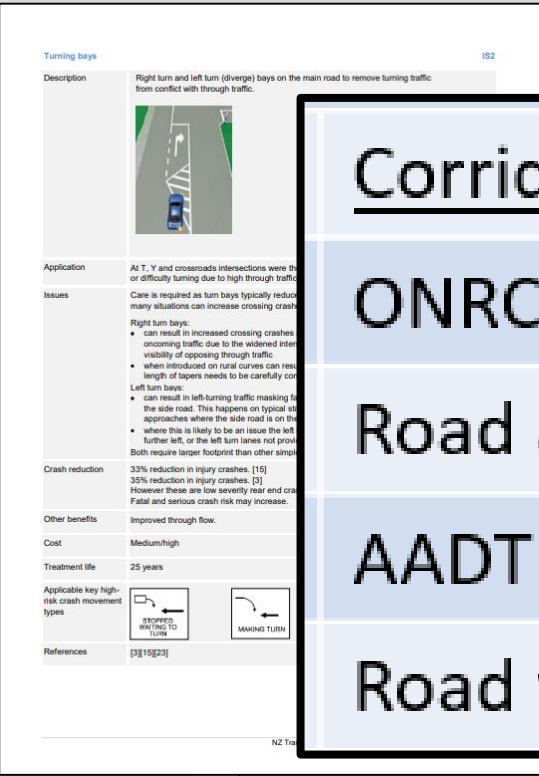
**Other benefits**  
Visually more pleasing than a sealed surface with stormwater drainage.

**Cost**  
\$-\$\$

**Treatment life**  
5-20 years

**References and guidelines**  
[68] [99]

NZ Transport Agency | High-risk road roads guide | September 2011



**Turning bays**

**Description**  
Right turn and left turn (diverge) bays on the main road to remove turning traffic from conflict with through traffic.

**Application**  
At T, Y and crossroads intersections where there is a high volume of turning traffic or difficulty turning due to high through traffic.

**Issues**  
Care is required as turn bays typically reduce the width of the main road. Many situations can increase crossing crashes.

**Right turn bays:**

- can result in increased crossing crashes as oncoming traffic due to the widened intersection visibility of opposing through traffic
- when introduced on rural curves can require length of tapered needs to be carefully considered

**Left turn bays:**

- can result in left-turning traffic masking for the side road. This happens on typical left approaches where the side road is on the left where this is likely to be an issue the left turn further left, or the left turn lanes not provided. Both require larger footprint than other simple treatments.

**Crash reduction**  
33% reduction in injury crashes. [10] 35% reduction in injury crashes. [3] However these are low severity road and crossroads. Fatal and serious crash risk may increase.

**Other benefits**  
Improved through flow.

**Cost**  
Medium/high

**Treatment life**  
25 years

**Applicable key high-risk crash movement types**

**References**  
[3] [10] [23]

NZ Transport Agency

Intervention	
Treatment Philosophy	Corridors
Crash type(s) addressed	ONRC
Urban / Rural	Road attributes
Crash reduction potential	AADT
Number of intersections	Road type (divided etc)
Control	Corridors
No. of approaches	ONRC
	Road attributes
	AADT
	Road type (divided etc)



# NORTHLAND TRANSPORTATION ALLIANCE







ONRC	Secondary Collector
AADT	<1000 vpd
Collective Risk	Low Medium
Personal Risk	High
OoCC	2
Speed limit	100km/h
SaAS	80km/h
Common Crashes	Run off Road

# NORTHLAND TRANSPORTATION ALLIANCE



Find address or place

## abley Safe Interventions

The treatment options below have been calculated based on the selected corridor in the map viewer.

Select suitable treatment options, then confirm the crash reduction factor and enter the cost of implementation for each. Added projects will appear in the Saved Programmes tab in the web viewer.

### Treatment Options

Treatment Philosophy

Treatment Options	% Crash Reduction	Est DSI Saved per Annum	Cost (\$) of Implementation	BCR	Select
Active signs (vehicle or speed activated)	<input type="text" value="35"/>	0.08	<input type="text"/>		<input type="checkbox"/>
Barriers at high risk locations	<input type="text" value="30"/>	0.07	<input type="text"/>		<input type="checkbox"/>
Curve warning	<input type="text" value="25"/>	0.06	<input type="text"/>		<input type="checkbox"/>
Reduce speed to SAAS	<input type="text" value="25"/>	0.06	<input type="text"/>		<input type="checkbox"/>

**Add custom intervention** Apply crash reduction to:

### Safety Programming Tool

Corridor Length	3.1 Km
ONRC	Secondary Collector
Collective Risk	Low Medium
Personal Risk	High
Environment	Rural
Speed Limit	100
Out of Context Curves	2
Safe and Appropriate Speed	80
Treatment Philosophy	Safer Corridors
Results Alignment	High

### Crash Details (2013-2017)

Head On	0
Run Off Road	4
Intersection	0
Wet	1
Dark	1
Pedestrian	0
Cyclist	0
Total	4

[Download counter measures](#)

# Case Study

**NORTHLAND TRANSPORTATION ALLIANCE**







Google

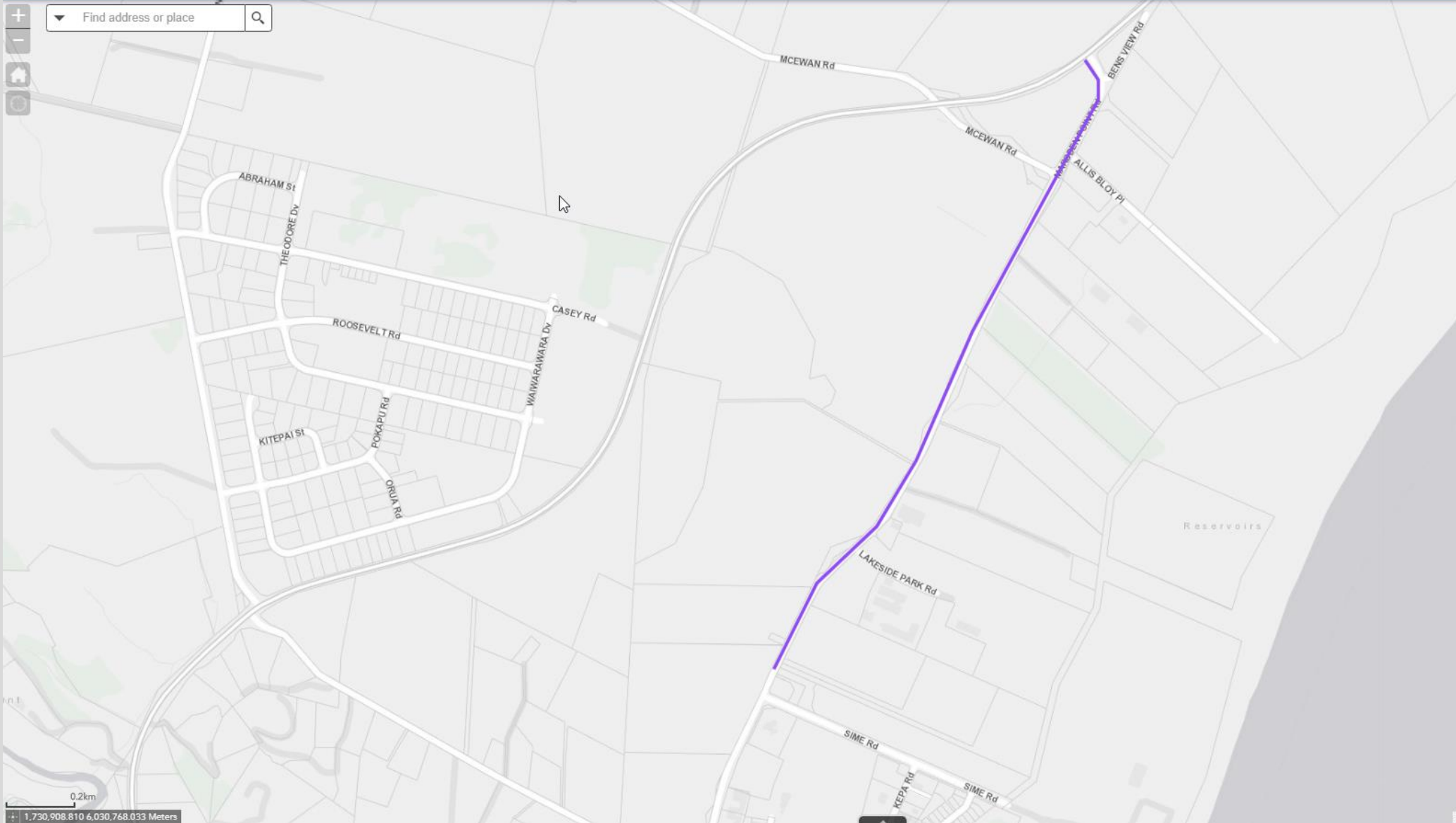
Image capture: Sep 2012 © 2019 Google New Zealand Terms Report a problem

# NORTHLAND TRANSPORTATION ALLIANCE





Find address or place



Select corridor/intersection

OR

Define custom start/end points

Corridor Details

Corridor Length	2.0 km
ONRC	Arterial
Collective Risk	Medium High
Personal Risk	High
Environment	Rural
Speed Limit	100
Out of Context Curves	1
Safe and Appropriate Speed	60
Treatment Philosophy	Transformational
Results Alignment	High


Crash Details (2013-2017)

Head On	1
Run Off Road	3
Intersection	0
Wet	0
Dark	4
Pedestrian	0
Cyclist	1
Total	6

[Download counter measures](#)

Launch Safe Interventions

Find address or place


**Safe Interventions**
✕

The treatment options below have been calculated based on the selected corridor in the map viewer.

Select suitable treatment options, then confirm the crash reduction factor and enter the cost of implementation for each. Added projects will appear in the Saved Programmes tab in the web viewer.

**Treatment Options**

Treatment Philosophy

Treatment Options	% Crash Reduction	Est DSi Saved per Annum	Cost (\$) of Implementation	BCR	Select
Reduce speed to SAAS	<input type="text" value="35"/>	0.14	<input type="text"/>		<input type="checkbox"/>
Mid Barrier	<input type="text" value="80"/>	0.13	<input type="text"/>		<input type="checkbox"/>
Clear zone increase (e.g. roadside hazard removal)	<input type="text" value="30"/>	0.12	<input type="text"/>		<input type="checkbox"/>
Roadside barriers (continuous)	<input type="text" value="45"/>	0.08	<input type="text"/>		<input type="checkbox"/>
Barriers at high risk locations	<input type="text" value="30"/>	0.05	<input type="text"/>		<input type="checkbox"/>

**Add custom intervention** Apply crash reduction to:

---

**Summary of projects**

Annual Est. DSi Saved

Add to Existing Programme 
  
 Add to New Programme

Safety Programming Tool ⬆ ✕

Select corridor/intersection

OR

Define custom start/end points

---

**Corridor Details**

Corridor Length	2.0 km
ONRC	Arterial
Collective Risk	Medium High
Personal Risk	High
Environment	Rural
Speed Limit	100
Out of Context Curves	1
Safe and Appropriate Speed	60
Treatment Philosophy	Transformational
Results Alignment	High

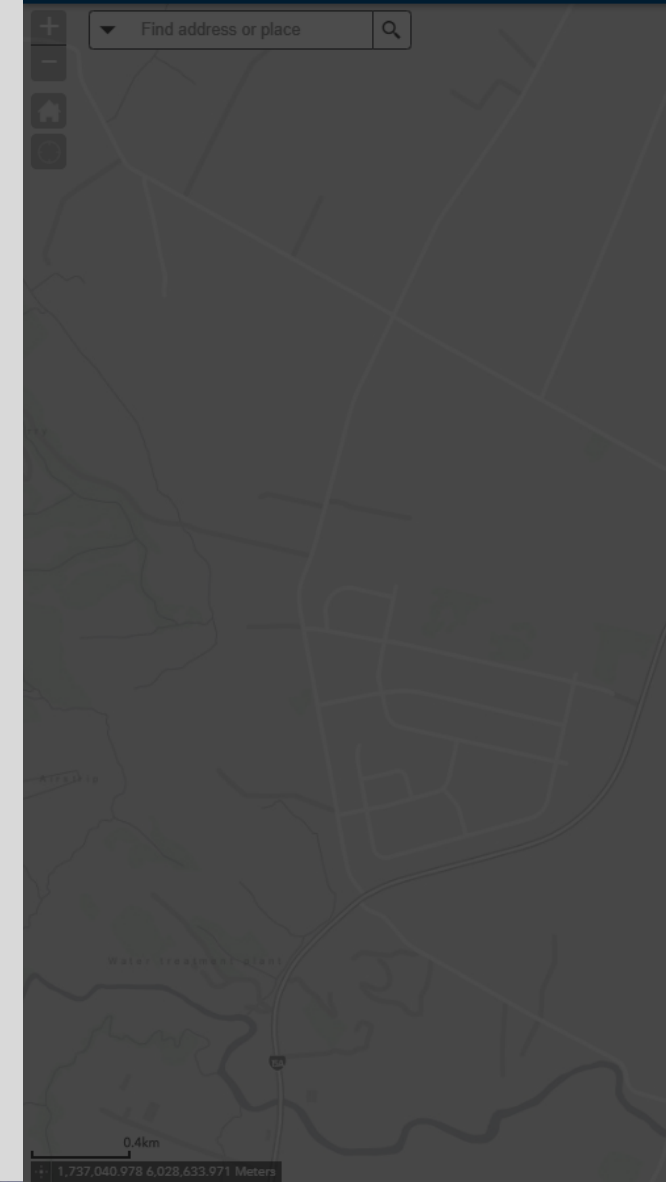
---

**Crash Details (2013-2017)**

Head On	1
Run Off Road	3
Intersection	0
Wet	0
Dark	4
Pedestrian	0
Cyclist	1
<b>Total</b>	<b>6</b>

[Download counter measures](#)

Launch Safe Interventions



**Safe Interventions**
✕

The treatment options below have been calculated based on the selected corridor in the map viewer.

Select suitable treatment options, then confirm the crash reduction factor and enter the cost of implementation for each. Added projects will appear in the Saved Programmes tab in the web viewer.

Treatment Options

Treatment Philosophy Transformational

Treatment Options	% Crash Reduction	Est DSi Saved per Annum	Cost (\$) of Implementation	BCR	Select
Reduce speed to SAAS	<input type="text" value="35"/>	0.14	<input type="text" value="\$30,000"/>	101.20	<input type="checkbox"/>
Mid Barrier	<input type="text" value="80"/>	0.13	<input type="text" value="\$4,000,000"/>	0.70	<input type="checkbox"/>
Clear zone increase (e.g. roadside hazard removal)	<input type="text" value="30"/>	0.12	<input type="text"/>		<input type="checkbox"/>
Roadside barriers (continuous)	<input type="text" value="45"/>	0.08	<input type="text" value="\$3,200,000"/>	0.54	<input type="checkbox"/>
Barriers at high risk locations	<input type="text" value="30"/>	0.05	<input type="text" value="\$1,000,000"/>	1.08	<input type="checkbox"/>

**Add custom intervention** Apply crash reduction to: All crash types Add Custom Intervention

Summary of projects

Annual Est. DSi Saved 0.00

Add to Programme

Add to Existing Programme Select a Programme

Add to New Programme

Safety Programming Tool ⤴ ✕

Select corridor/intersection

OR

Define custom start/end points

---

Corridor Details

Corridor Length	2.0 km
ONRC	Arterial
Collective Risk	Medium High
Personal Risk	High
Environment	Rural
Speed Limit	100
Out of Context Curves	1
Safe and Appropriate Speed	60
Treatment Philosophy	Transformational
Results Alignment	High

---

Crash Details (2013–2017)

Head On	1
Run Off Road	3
Intersection	0
Wet	0
Dark	4
Pedestrian	0
Cyclist	1
<b>Total</b>	<b>6</b>

[Download counter measures](#)

Launch Safe Interventions

Find address or place

# abley Safe Interventions

The treatment options below have been calculated based on the selected corridor in the map viewer.  
 Select suitable treatment options, then confirm the crash reduction factor and enter the cost of implementation for each. Added projects will appear in the Saved Programmes tab in the web viewer.

### Treatment Options

Treatment Philosophy

Treatment Options	% Crash Reduction	Est DSi Saved per Annum	Cost (\$) of Implementation	BCR	Select
Reduce speed to SAAS	<input type="text" value="35"/>	0.14	<input type="text" value="\$30,000"/>	101.20	<input type="checkbox"/>
Mid Barrier	<input type="text" value="80"/>	0.13	<input type="text" value="\$4,000,000"/>	0.70	<input type="checkbox"/>
Clear zone increase (e.g. roadside hazard removal)	<input type="text" value="30"/>	0.12	<input type="text"/>		<input type="checkbox"/>
Roadside barriers (continuous)	<input type="text" value="45"/>	0.08	<input type="text" value="\$3,200,000"/>	0.54	<input type="checkbox"/>
Barriers at high risk locations	<input type="text" value="30"/>	0.05	<input type="text" value="\$1,000,000"/>	1.08	<input type="checkbox"/>

Add custom intervention Apply crash reduction to:

- All crash types
- Run off road
- Head On (corridor sections)
- Intersection (corridor sections)
- Wet
- Dark
- Right turn against (intersections)
- Crossing (intersections)
- Movement H,J,K,L (intersections)
- Movement G (intersections)
- Cyclist (intersections)
- Pedestrian (intersections)

### Summary of projects

Annual Est. DSi Saved

OR

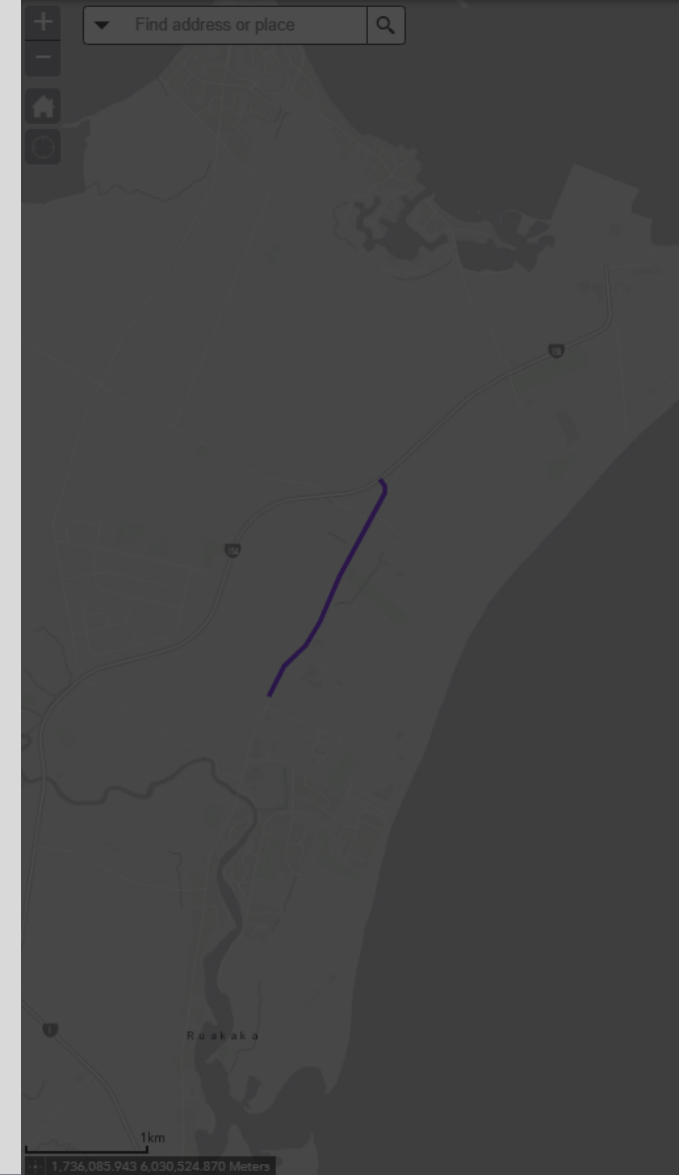
### Corridor Details

Corridor Length	2.0 km
ONRC	Arterial
Collective Risk	Medium High
Personal Risk	High
Environment	Rural
Speed Limit	100
Out of Context Curves	1
Safe and Appropriate Speed	60
Treatment Philosophy	Transformational
Results Alignment	High

### Crash Details (2013-2017)

Head On	1
Run Off Road	3
Intersection	0
Wet	0
Dark	4
Pedestrian	0
Cyclist	1
Total	6

[Download counter measures](#)



**Safe Interventions**
✕

Reduce speed to SAAS	<input type="text" value="35"/>	0.14	<input type="text" value="\$30,000"/>	101.20	<input checked="" type="checkbox"/>
Mid Barrier	<input type="text" value="80"/>	0.13	<input type="text" value="\$4,000,000"/>	0.70	<input type="checkbox"/>
Clear zone increase (e.g. roadside hazard removal)	<input type="text" value="30"/>	0.12	<input type="text"/>		<input type="checkbox"/>
Roadside barriers (continuous)	<input type="text" value="45"/>	0.08	<input type="text" value="\$3,200,000"/>	0.54	<input type="checkbox"/>
Barriers at high risk locations	<input type="text" value="30"/>	0.05	<input type="text" value="\$1,000,000"/>	1.08	<input checked="" type="checkbox"/>
ATP Centreline and Edgeline	<input type="text" value="15"/>	0.06	<input type="text" value="\$200,000"/>	6.51	<input checked="" type="checkbox"/>

**Add custom intervention** Apply crash reduction to:

**Summary of projects**

Annual Est. DSI Saved	<input type="text" value="0.19"/>
Total Cost of Implementation	<input type="text" value="\$1,230,000"/>
BCR	<input type="text" value="3.40"/>
Results Alignment	<input type="text" value="High"/>

**Add to Programme**

Add to Existing Programme

Add to New Programme

Project Name

Project Description

RSRP Start

RSRP End

Safety Programming Tool ⬆️ ✕

OR

---

**Corridor Details**

Corridor Length	2.0 km
ONRC	Arterial
Collective Risk	Medium High
Personal Risk	High
Environment	Rural
Speed Limit	100
Out of Context Curves	1
Safe and Appropriate Speed	60
Treatment Philosophy	Transformational
Results Alignment	High

---

**Crash Details (2013-2017)**

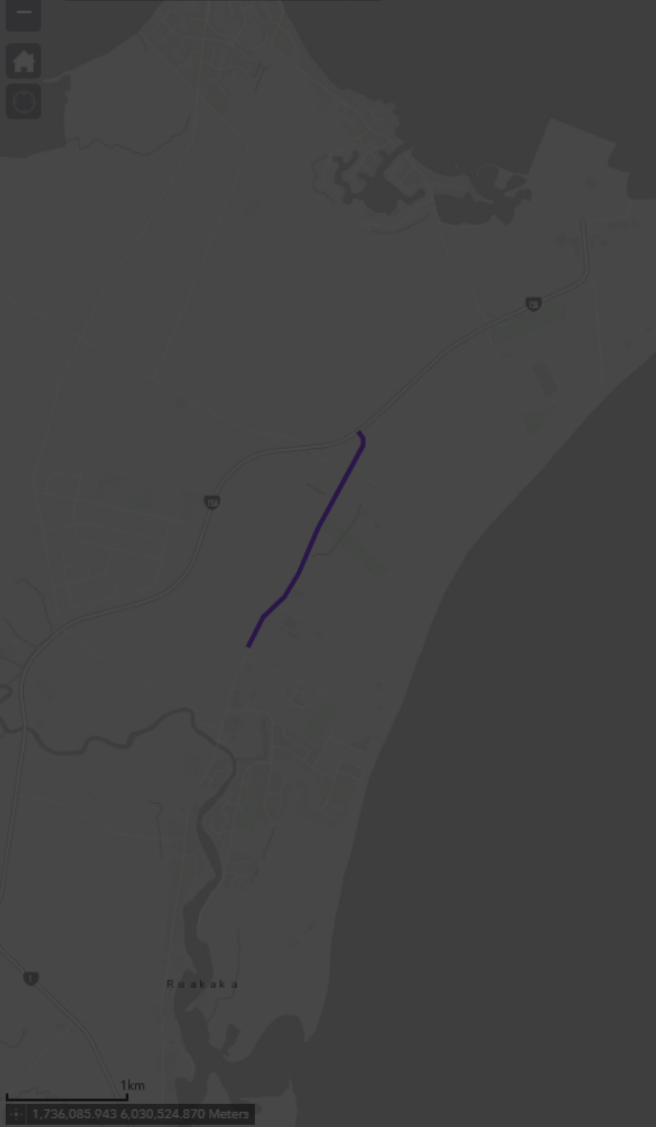
Head On	1
Run Off Road	3
Intersection	0
Wet	0
Dark	4
Pedestrian	0
Cyclist	1
<b>Total</b>	<b>6</b>

[Download counter measures](#)





Find address or place



### abley Safe Interventions

Reduce speed to SAAS	35	0.14	\$30,000	101.20	<input checked="" type="checkbox"/>
Mid Barrier	80	0.13	\$4,000,000	0.70	<input type="checkbox"/>
Clear zone increase (e.g. roadside hazard removal)	30	0.12			<input type="checkbox"/>
Roadside barriers (continuous)	45	0.08	\$3,200,000	0.54	<input type="checkbox"/>
Barriers at high risk locations	30	0.05	\$1,000,000	1.08	<input checked="" type="checkbox"/>
ATP Centreline and Edgeline	15	0.06	\$200,000	6.51	<input checked="" type="checkbox"/>

**Add custom intervention** Apply crash reduction to: All crash types Add Custom Intervention

**Summary of projects**

Annual Est. DSi Saved:

Total Cost of Implementation:

BCR:

Results Alignment:

**Add to Programme**

Add to Existing Programme: Select a Programme

Add to New Programme: Select a Programme

Project Name:

Project Description:

RSRP Start:

RSRP End:

Select corridor/intersection

OR

Define custom start/end points

Corridor Details

Corridor Length	2.0 km
ONRC	Arterial
Collective Risk	Medium High
Personal Risk	High
Environment	Rural
Speed Limit	100
Out of Context Curves	1
Safe and Appropriate Speed	60
Treatment Philosophy	Transformational
Results Alignment	High

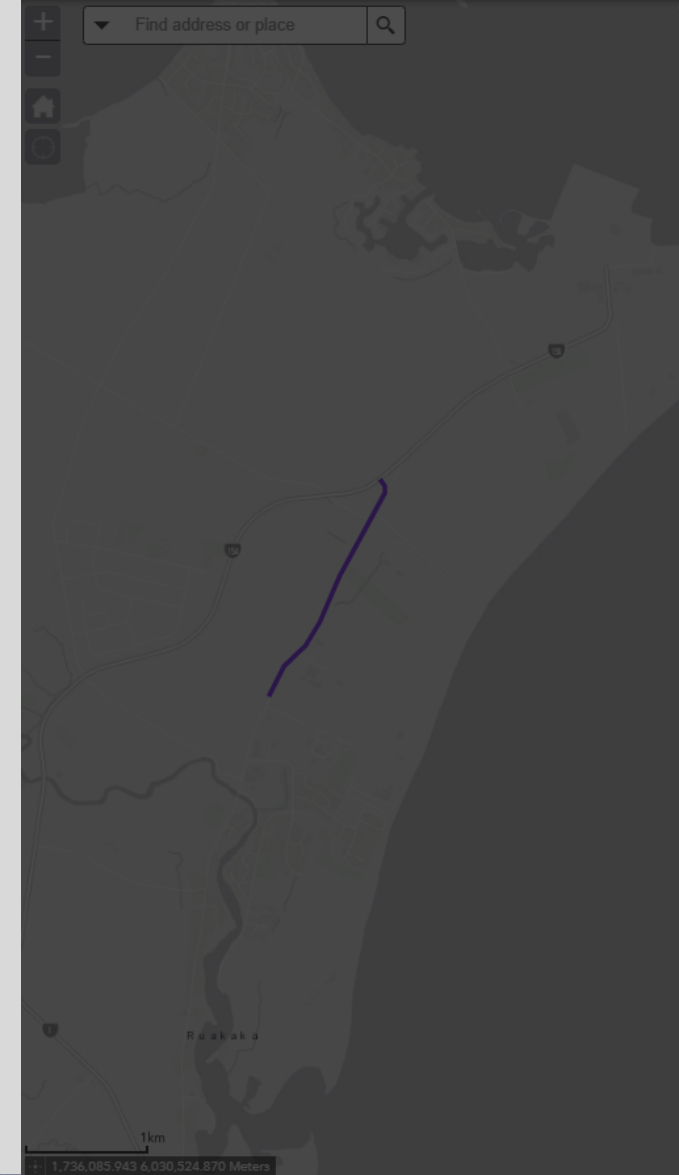
Crash Details (2013-2017)

Head On	1
Run Off Road	3
Intersection	0
Wet	0
Dark	4
Pedestrian	0
Cyclist	1
Total	6

[Download counter measures](#)

Launch Safe Interventions





### abley Safe Interventions

Reduce speed to SAAS	35	0.14	\$30,000	101.20	<input checked="" type="checkbox"/>
Mid Barrier	80	0.13	\$4,000,000	0.70	<input type="checkbox"/>
Clear zone increase (e.g. roadside hazard removal)	30	0.12			<input type="checkbox"/>
Roadside barriers (continuous)	45	0.08	\$3,200,000	0.54	<input type="checkbox"/>
Barriers at high risk locations	30	0.05	\$1,000,000	1.08	<input checked="" type="checkbox"/>
ATP Centreline and Edgeline	15	0.06	\$200,000	6.51	<input checked="" type="checkbox"/>

**Add custom intervention** Apply crash reduction to: All crash types Add Custom Intervention

**Summary of projects**

Annual Est. DSI Saved: 0.19

Total Cost of Implementation: \$1,230,000

BCR: 3.40

Results Alignment: High

**Add to Programme**

Add to Existing Programme: Select a Programme

Add to New Programme:

Project Name:

Project Description:

RSRP Start:

RSRP End:

### Safety Programming Tool

Select corridor/intersection

OR

Define custom start/end points

**Corridor Details**

Corridor Length	2.0 km
ONRC	Arterial
Collective Risk	Medium High
Personal Risk	High
Environment	Rural
Speed Limit	100
Out of Context Curves	1
Safe and Appropriate Speed	60
Treatment Philosophy	Transformational
Results Alignment	High

**Crash Details (2013-2017)**

Head On	1
Run Off Road	3
Intersection	0
Wet	0
Dark	4
Pedestrian	0
Cyclist	1
Total	6

[Download counter measures](#)

Launch Safe Interventions



Find address or place



30km  
1,725,741.516 6,208,176.720 Meters

Safety Programming Tool

**i** This tool analyses crash statistics on road sections and suggests possible safety treatments

Add Projects Saved Programmes

Select a saved programme:

Carl Test

Adjust the programme budget value below, then prioritise by either BCR, DSI Saved per KM, DSI Saved per Dollar Spent or DSI Saved per VKT. The total activity cost represents the sum of all projects saved to this programme.

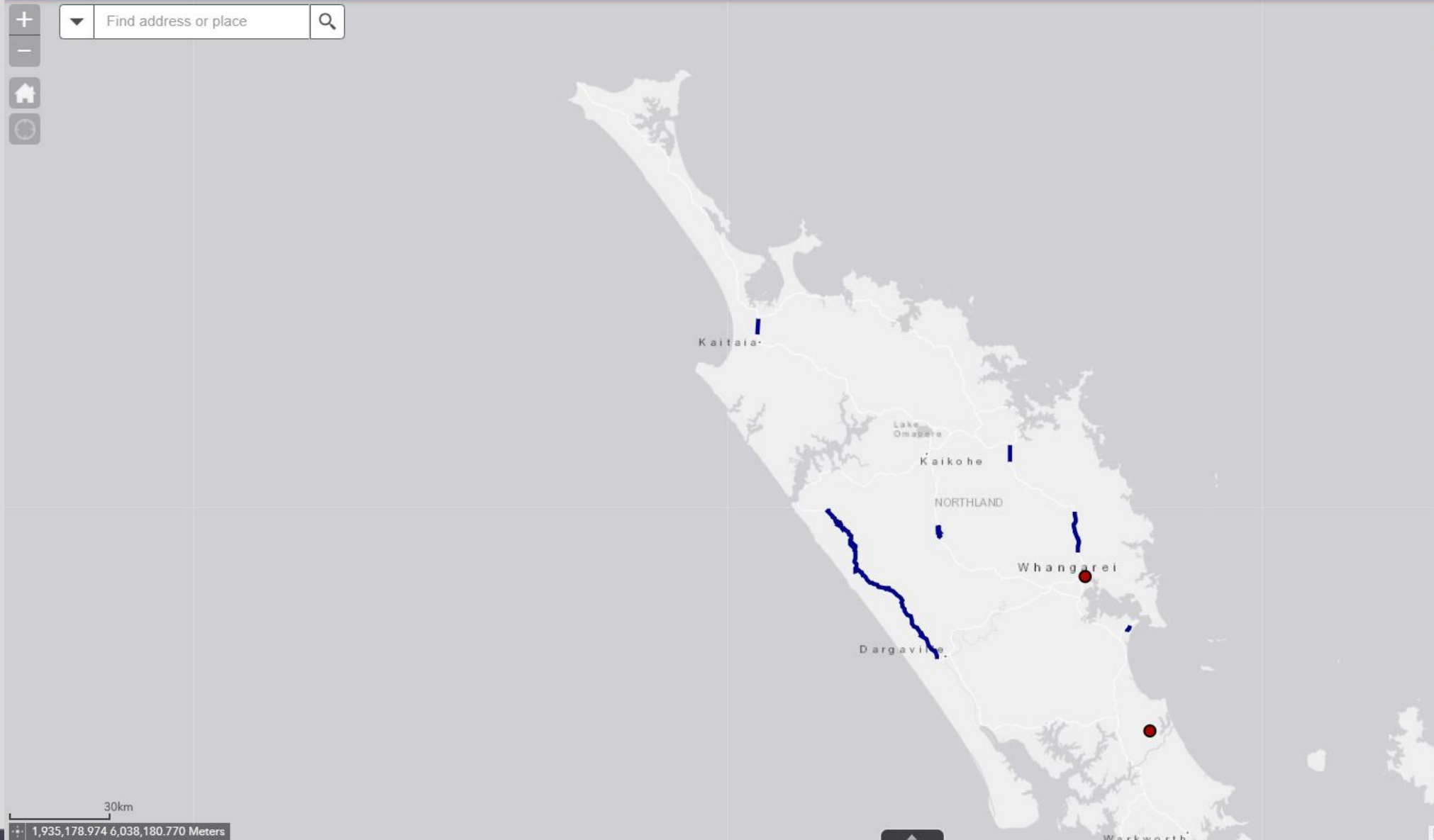
Programme Budget	\$25,000,000
Total activity cost	\$46,038,000

Prioritise by:  
DSI saved per dollar spent

8 out of 11 projects fit within the programme budget when prioritised this way.

Download CSV





**i** This tool analyses crash statistics on road sections and suggests possible safety treatments

Select a saved programme:

Carl Test

Adjust the programme budget value below, then prioritise by either BCR, DSI Saved per KM, DSI Saved per Dollar Spent or DSI Saved per VKT. The total activity cost represents the sum of all projects saved to this programme.

Programme Budget	\$25,000,000
Total activity cost	\$46,038,000

**Prioritise by:**

DSI saved per VKT

8 out of 11 projects fit within the programme budget when prioritised this way.

# Next Steps

- Expanding dataset of interventions based on international best practice
- Refine economic assessments
- Post implementation performance tracking
- RAMM and RP data

# Conclusion

- Streamlining processes
- Better prioritisation of programmes
- Enable programme flexibility