Programming Tool

NORTHLAND TRANSPORTATION ALLIANCE

abley

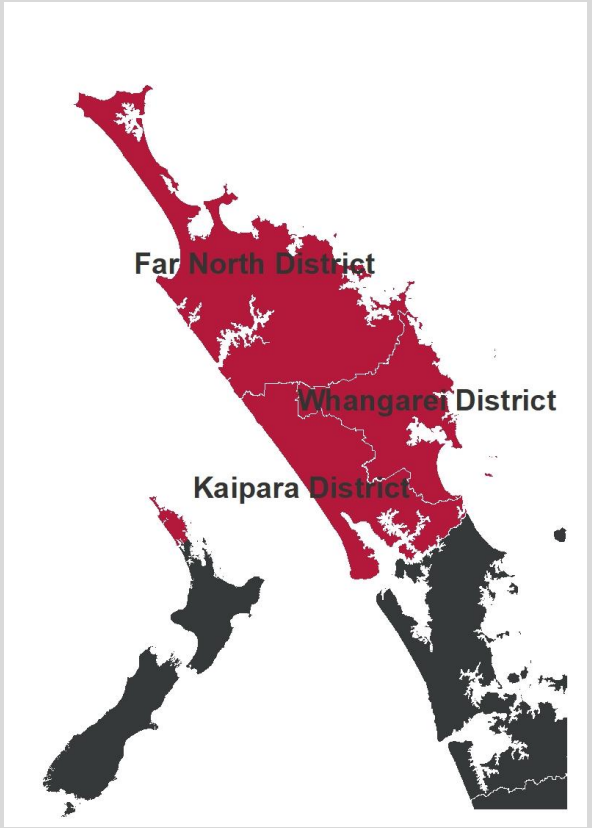
Insightful solutions.
Empowering advice.

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.

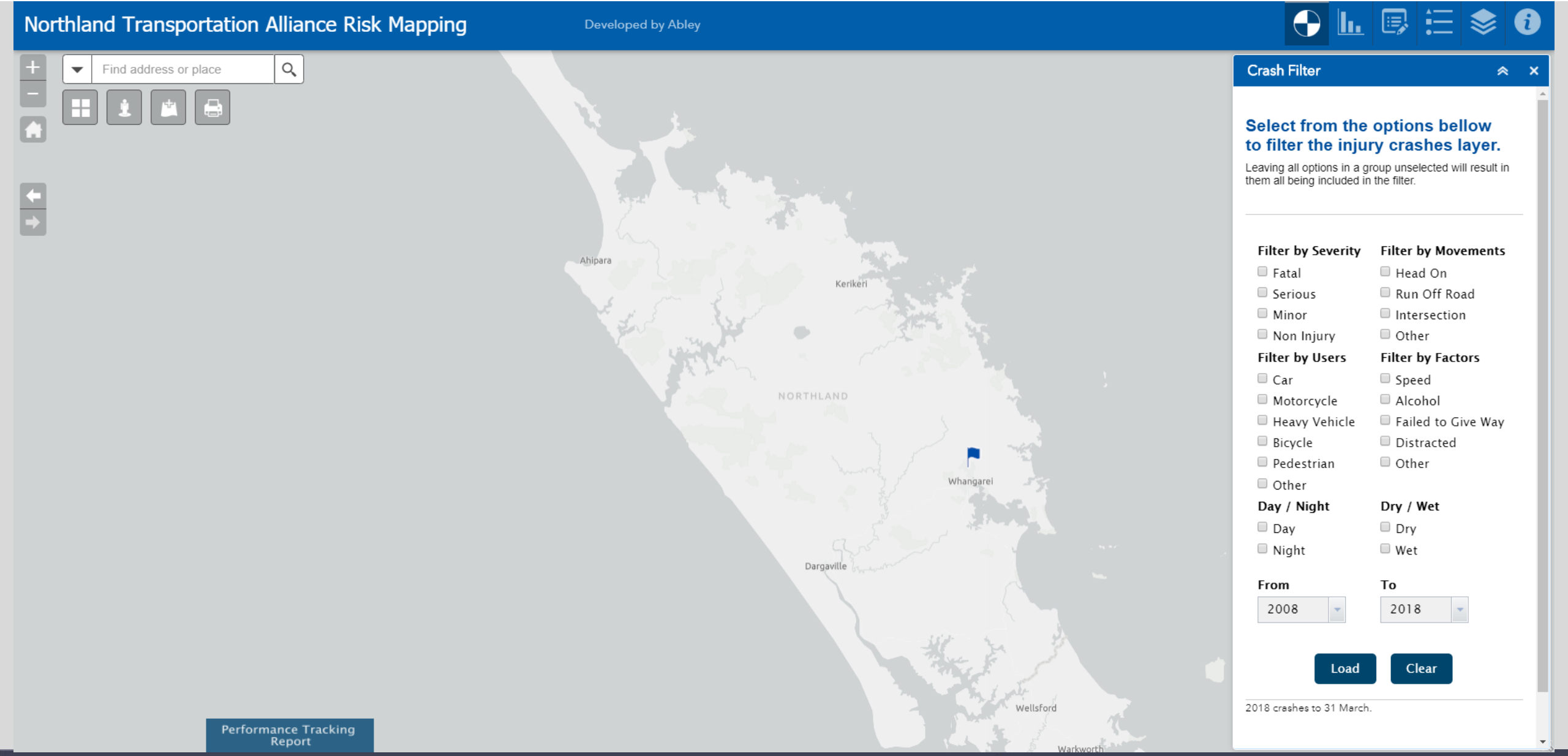
Barriers to programme development

- 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

Northland Transportation Alliance Risk Mapping

Developed by Abley



Crash Filter

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

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

Filter by Severity

- Fatal
- Serious
- Minor
- Non Injury

Filter by Movements

- Head On
- Run Off Road
- Intersection
- Other

Filter by Users

- Car
- Motorcycle
- Heavy Vehicle
- Bicycle
- Pedestrian
- Other

Filter by Factors

- Speed
- Alcohol
- Failed to Give Way
- Distracted
- Other

Day / Night

- Day
- Night

Dry / Wet

- Dry
- Wet

From 2008

To 2018

Load Clear

2018 crashes to 31 March.

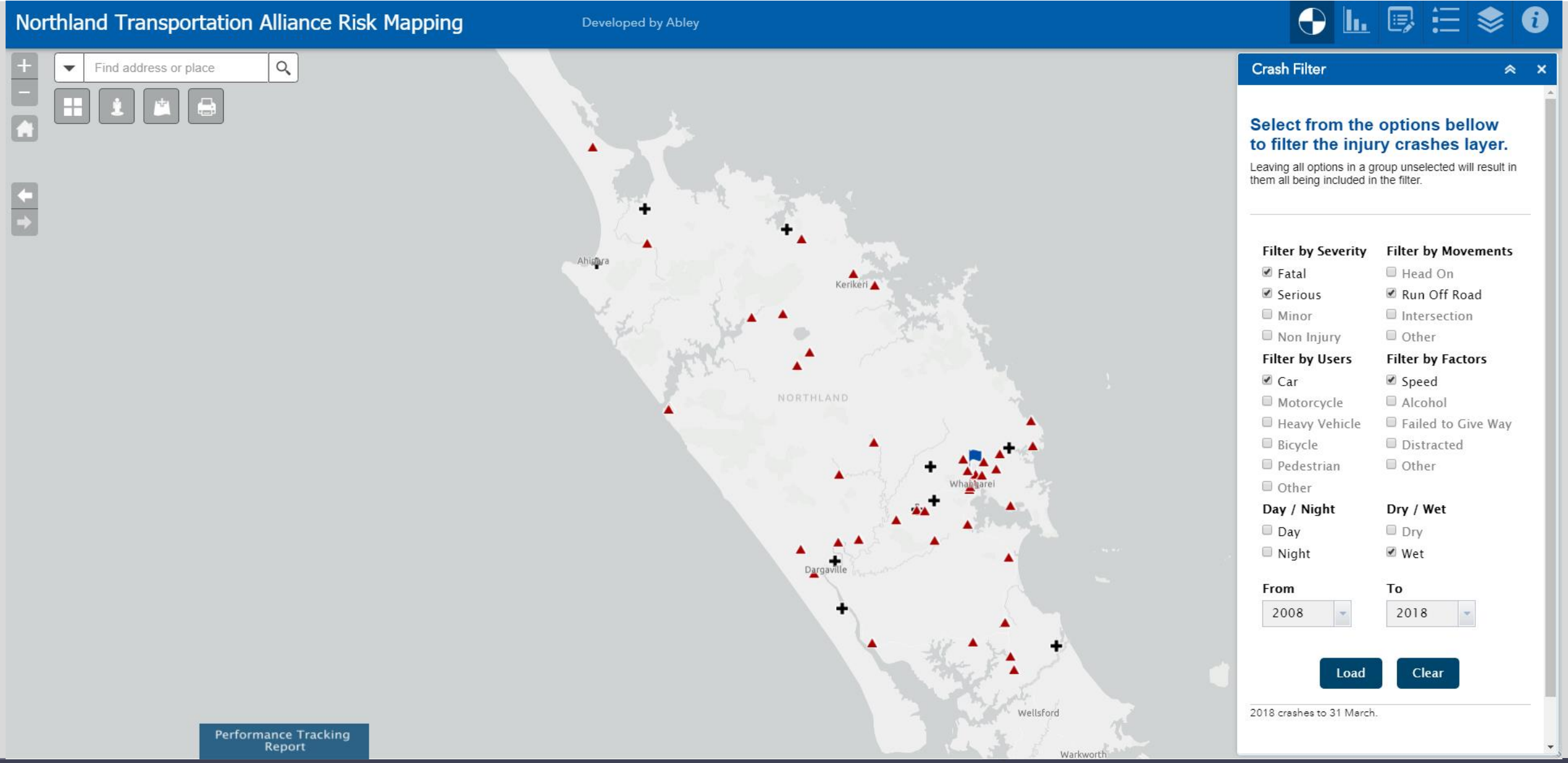
NORTHLAND TRANSPORTATION ALLIANCE

Far North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

Abley

Northland Transportation Alliance Risk Mapping

Developed by Abley



Crash Filter

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

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

Filter by Severity

- [x] Fatal
- [x] Serious
- [ ] Minor
- [ ] Non Injury

Filter by Movements

- [ ] Head On
- [x] Run Off Road
- [ ] Intersection
- [ ] Other

Filter by Users

- [x] Car
- [ ] Motorcycle
- [ ] Heavy Vehicle
- [ ] Bicycle
- [ ] Pedestrian
- [ ] Other

Filter by Factors

- [x] Speed
- [ ] Alcohol
- [ ] Failed to Give Way
- [ ] Distracted
- [ ] Other

Day / Night

- [ ] Day
- [ ] Night

Dry / Wet

- [ ] Dry
- [x] Wet

From 2008

To 2018

Load Clear

2018 crashes to 31 March.

NORTHLAND TRANSPORTATION ALLIANCE

Far North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

Abley

Northland Transportation Alliance Risk Mapping

Developed by Abley

Find address or place

Performance Tracking Report

CrashBoard

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

Collective Risk

Medium High

Personal Risk

Medium

Crash Movements

Crash Movements Guide

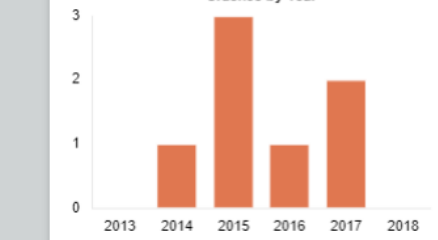
Total Injury Crashes

8

Fatal and Serious Crashes

3

Crashes by Year



2018 crashes to 31 March.

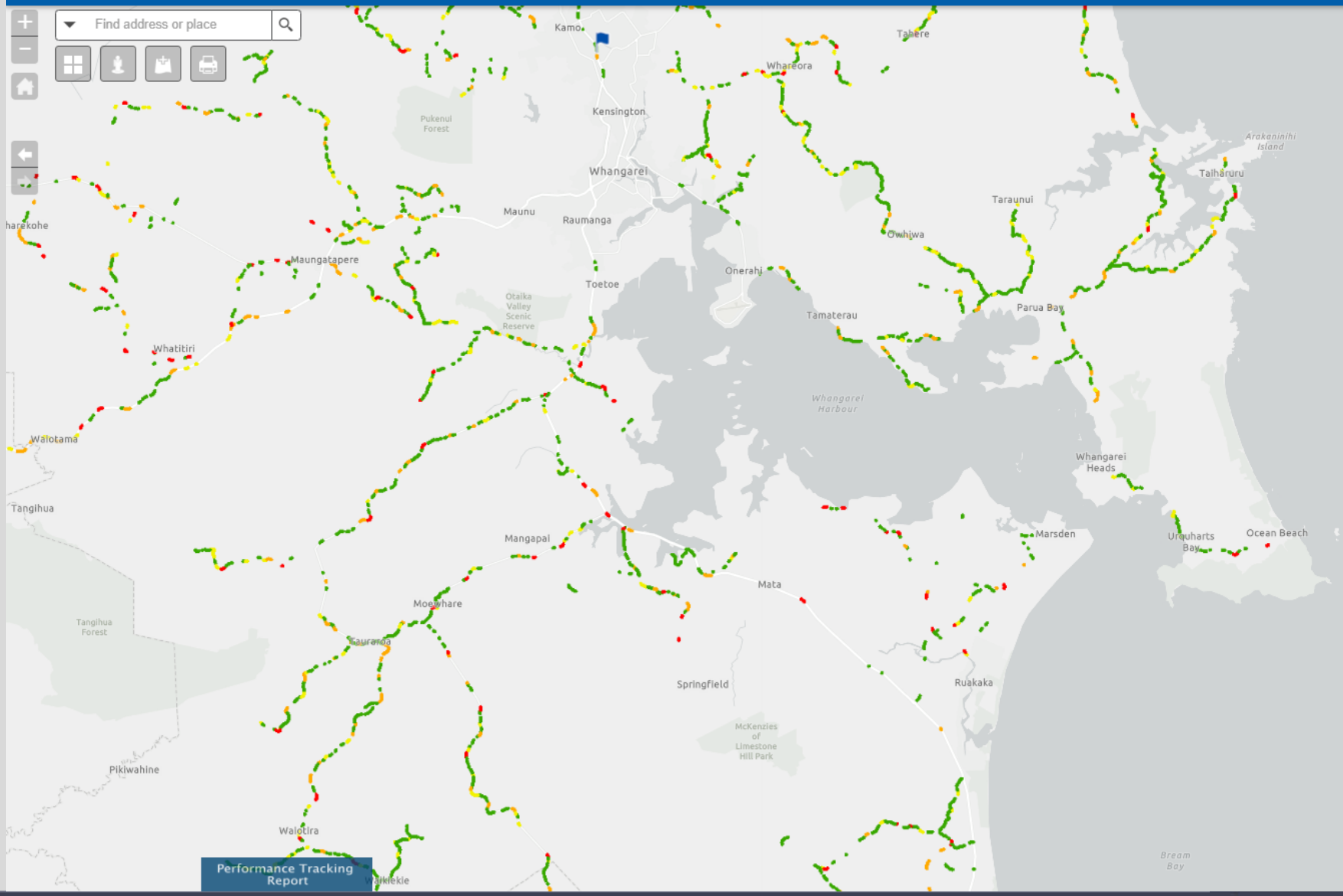
NORTHLAND TRANSPORTATION ALLIANCE

Far North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

Abley

Northland Transportation Alliance Risk Mapping

Developed by Ably



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
- [x] Individual Curve Analysis (ACC)
- [ ] High Risk Corridors - Curves (NZTA)
- [ ] High Benefit Opportunities
- [ ] Speed Management Framework (from Megamaps)

NORTHLAND TRANSPORTATION ALLIANCE

Far North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

ably

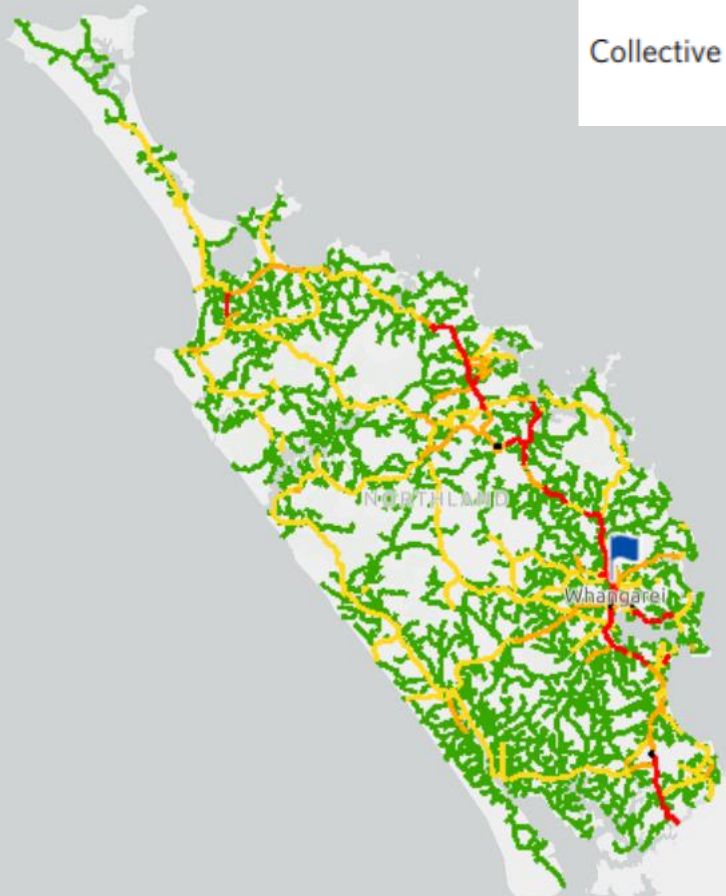
Why the tool was developed

Northland Transportation Alliance Risk Mapping

Developed by Abley

Find address or place

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



Performance Tracking Report

Layer List

NORTHLAND TRANSPORTATION ALLIANCE

For North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

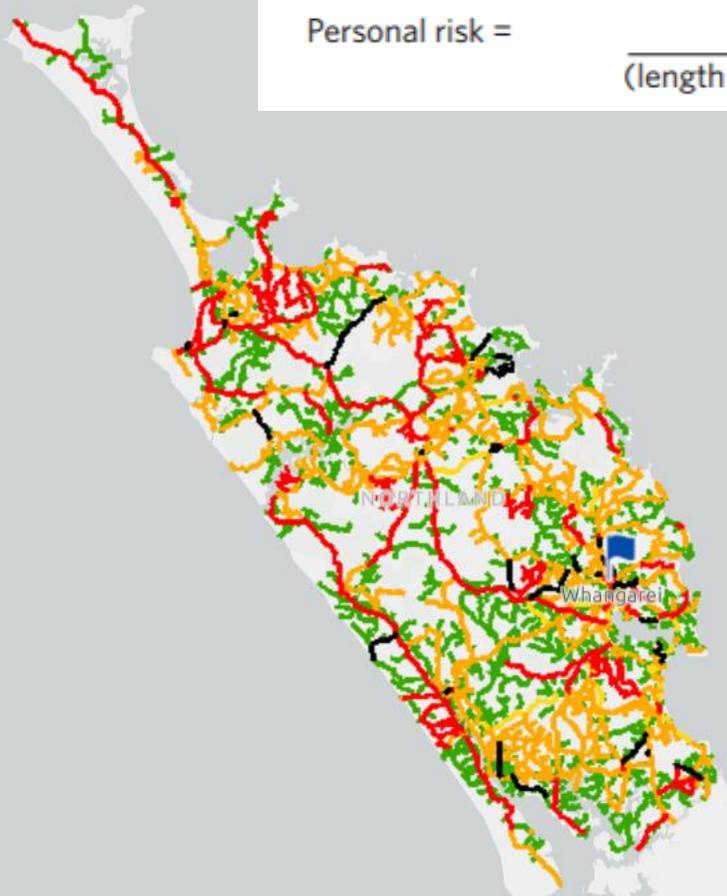
Abley

Northland Transportation Alliance Risk Mapping

Developed by Abley

Find address or place

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



Performance Tracking Report

Layer List

NORTHLAND TRANSPORTATION ALLIANCE

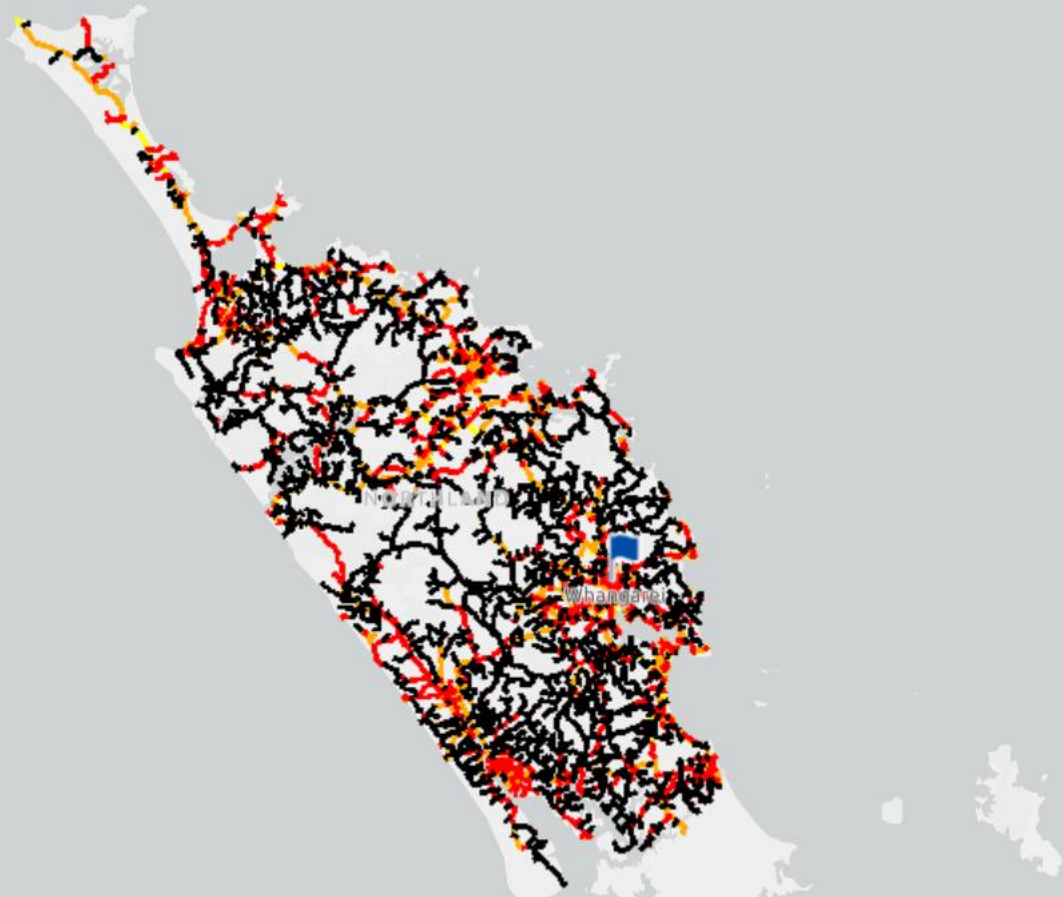
For North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

abley

Northland Transportation Alliance Risk Mapping

Developed by Abley

Find address or place



Performance Tracking Report

Layer List

NORTHLAND TRANSPORTATION ALLIANCE

Far North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

abley

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

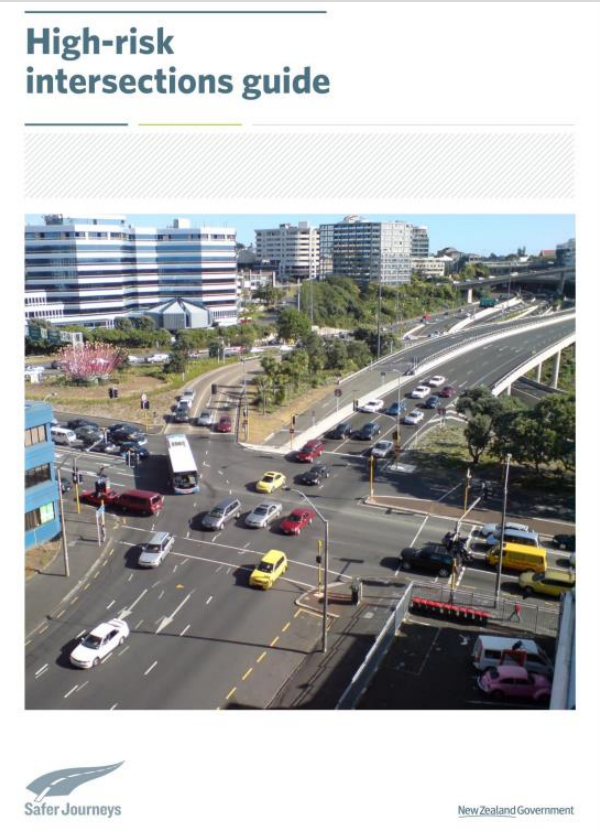
Work Smarter, Not Harder.

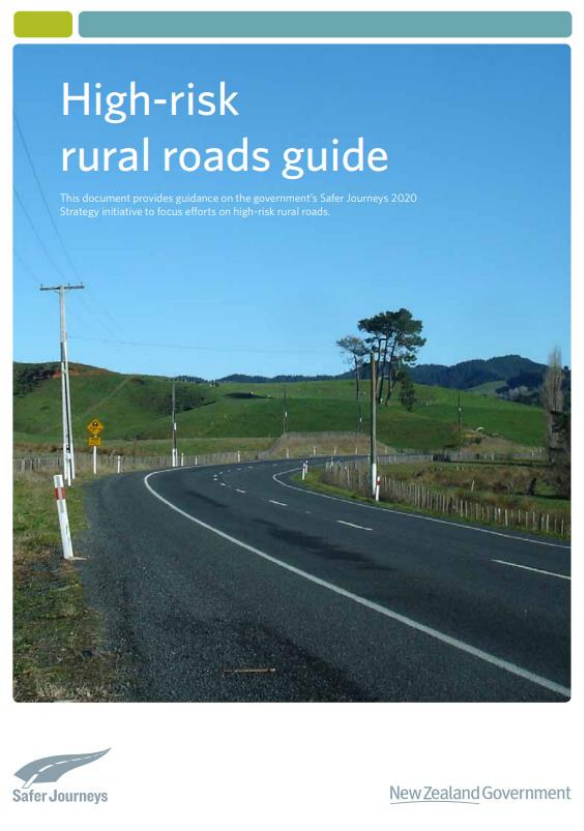
https://me.me/i/work-smarter-not-harder-4916699

Fabley

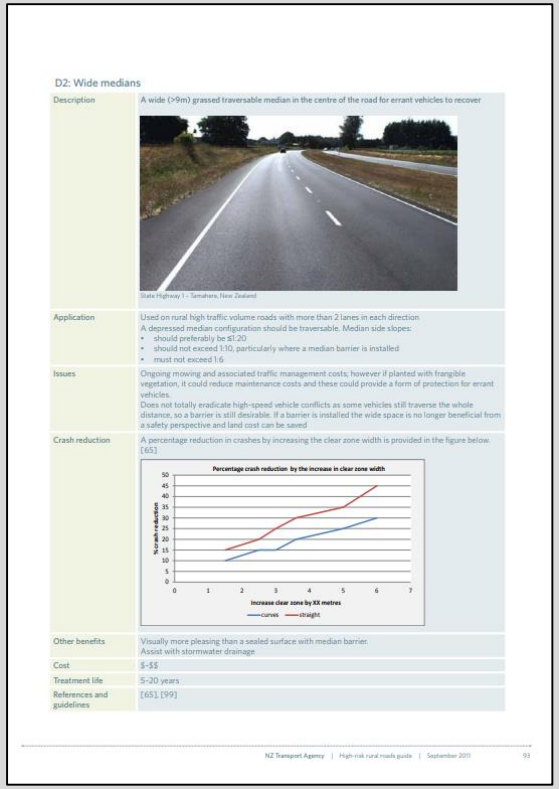
NORTHLAND TRANSPORTATION ALLIANCE

Step 1. Create Database



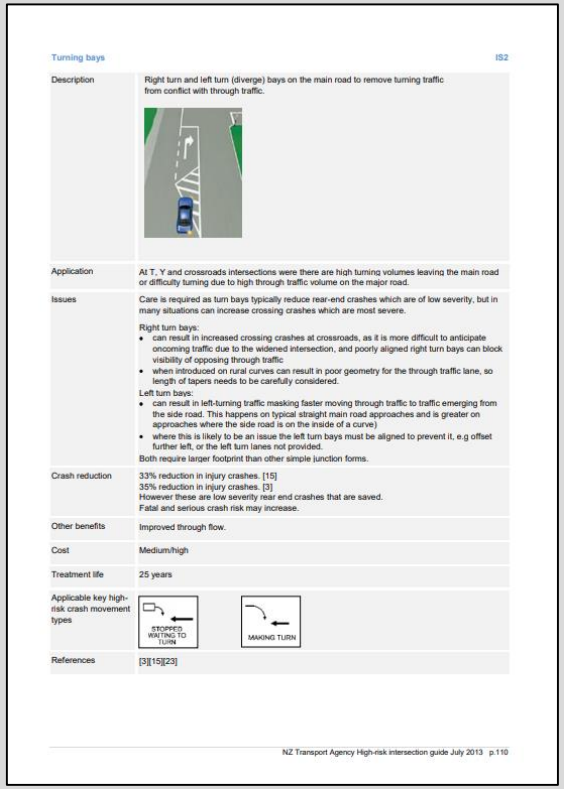


Step 1. Create Database



D2: Wide medians

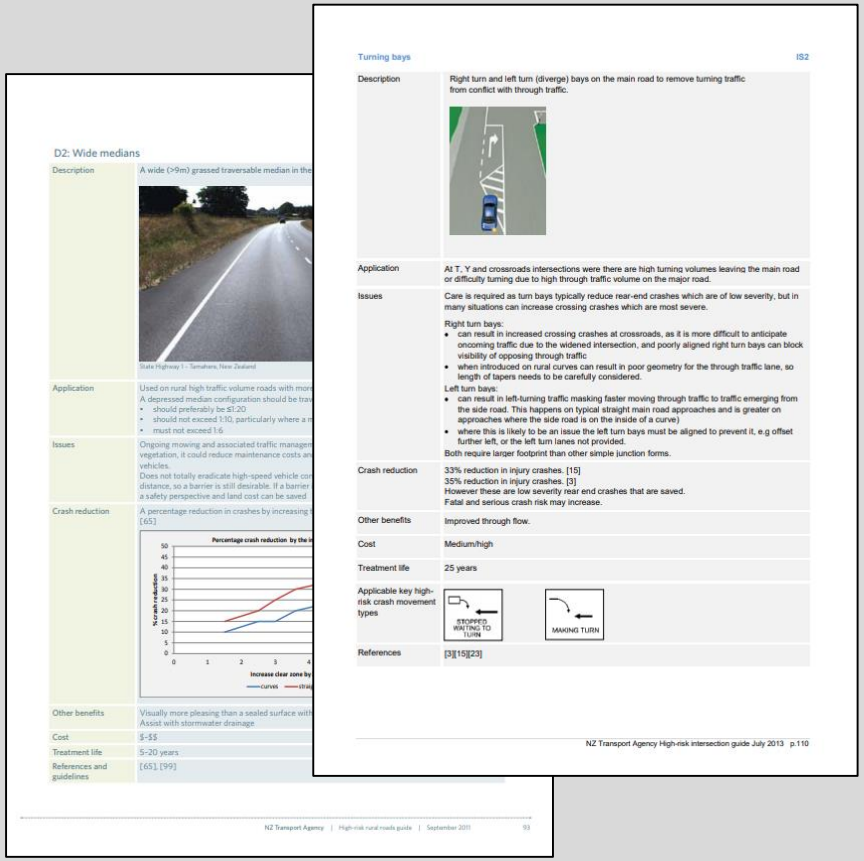
Description	A wide (>9m) grassed traversable median in the centre of the road for errant vehicles to recover
Application	Used on rural high traffic volume roads with more than 2 lanes in each direction A depressed median configuration should be traversable. Median side slopes: • should preferably be ≤1:20 • should not exceed 1:10, 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]
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]



Turning bays IS2

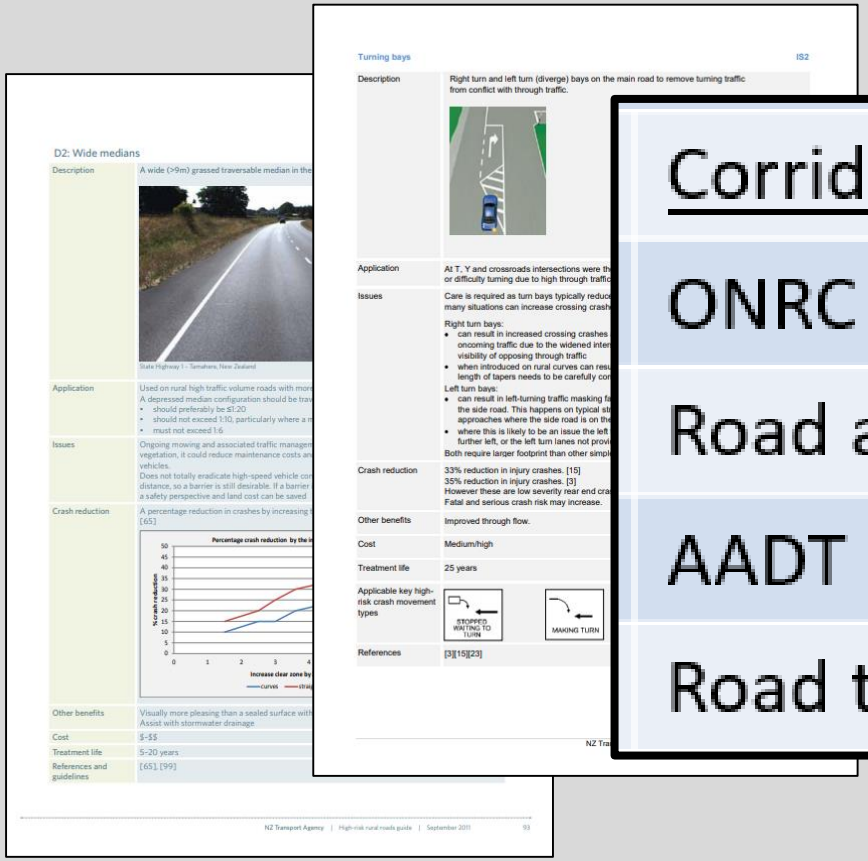
Description	Right turn and left turn (diverge) bays on the main road to remove turning traffic from conflict with through traffic.
Application	At T, Y and crossroads intersections were there are high turning volumes leaving the main road or difficulty turning due to high through traffic volume on the 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 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	STOPPED WAITING TO TURN MAKING TURN
References	[3][15][23]

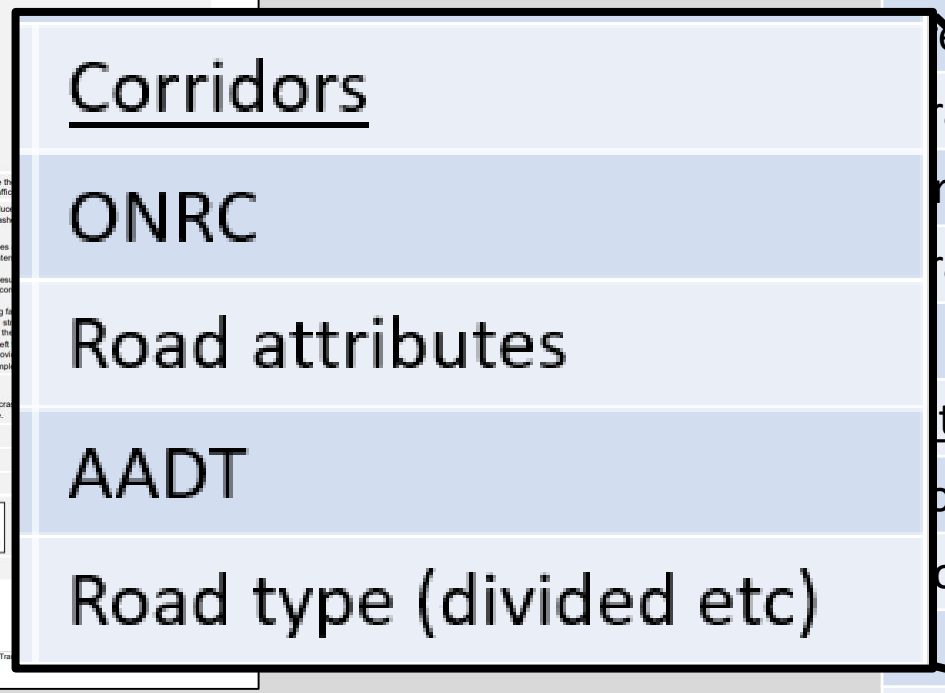
Step 1. Create Database



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





Intervention	
eatment Philosophy	
rash type(s) addressed	
rban / Rural	
rash reduction potential	
tersections	Corridors
ontrol	ONRC
o. of approaches	Road attributes
	AADT
	Road type (divided etc)

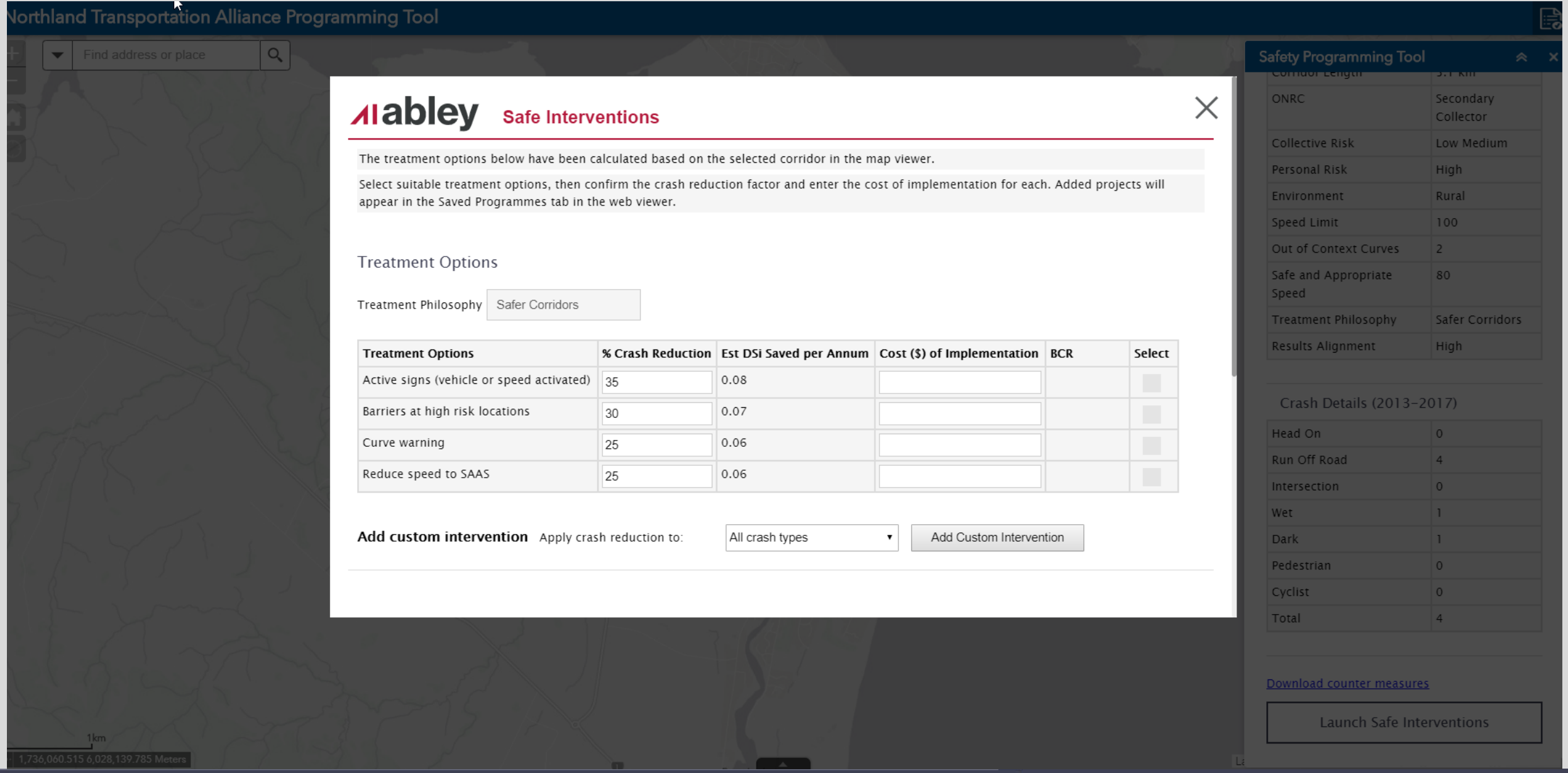
NORTHLAND TRANSPORTATION ALLIANCE

For North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

ableyabley

McEwan Rd

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



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: Safer Corridors

Treatment Options	% Crash Reduction	Est DSi Saved per Annum	Cost ($) of Implementation	BCR	Select
Active signs (vehicle or speed activated)	35	0.08			
Barriers at high risk locations	30	0.07			
Curve warning	25	0.06			
Reduce speed to SAAS	25	0.06			

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

NORTHLAND TRANSPORTATION ALLIANCE

For North District Council · KAIPARA DISTRICT · WHANGAREI DISTRICT COUNCIL · NORTHLAND REGIONAL COUNCIL · NZ TRANSPORT AGENCY

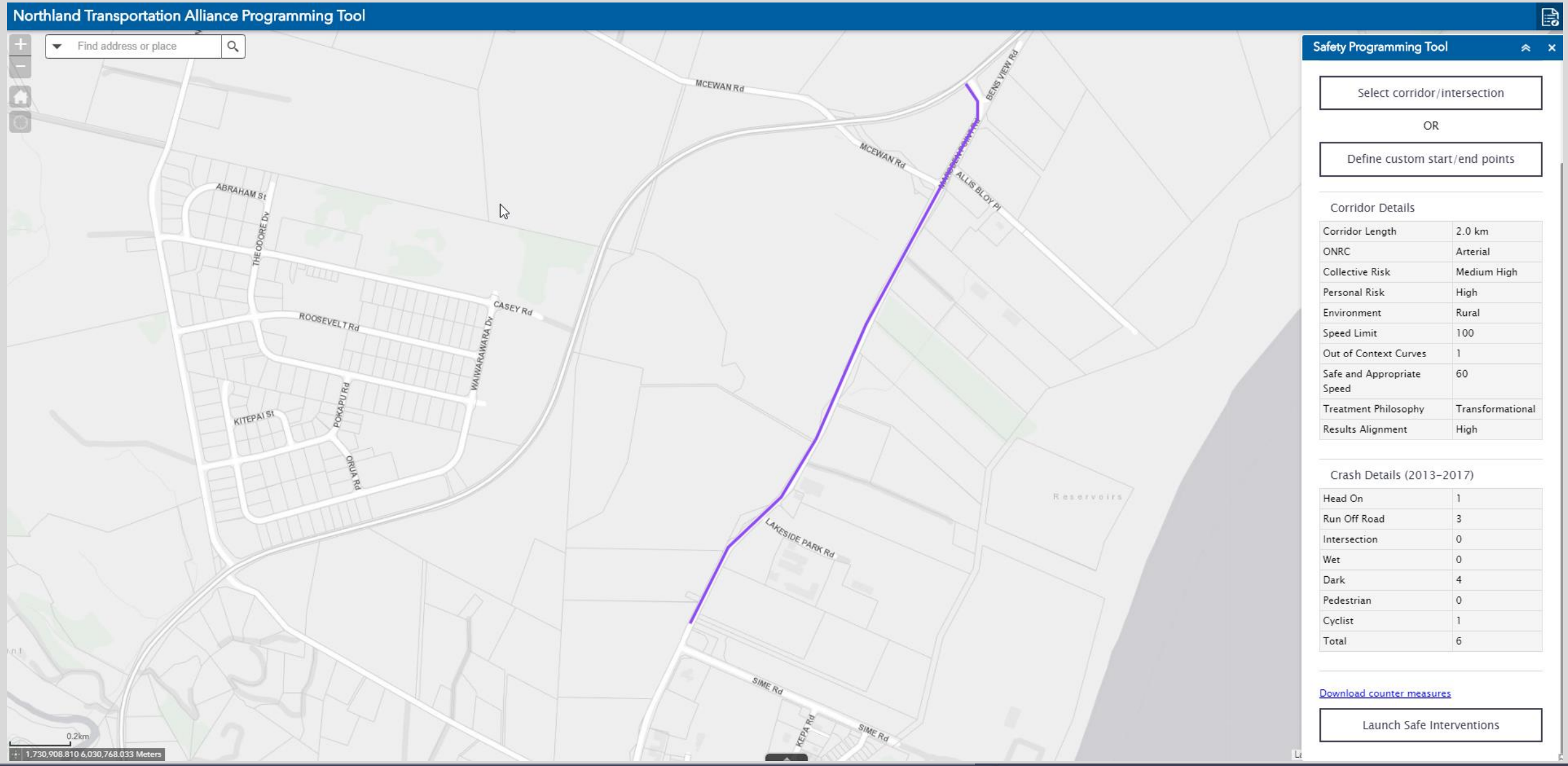
ABLEY

Case Study

NORTHLAND TRANSPORTATION ALLIANCE

Far North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

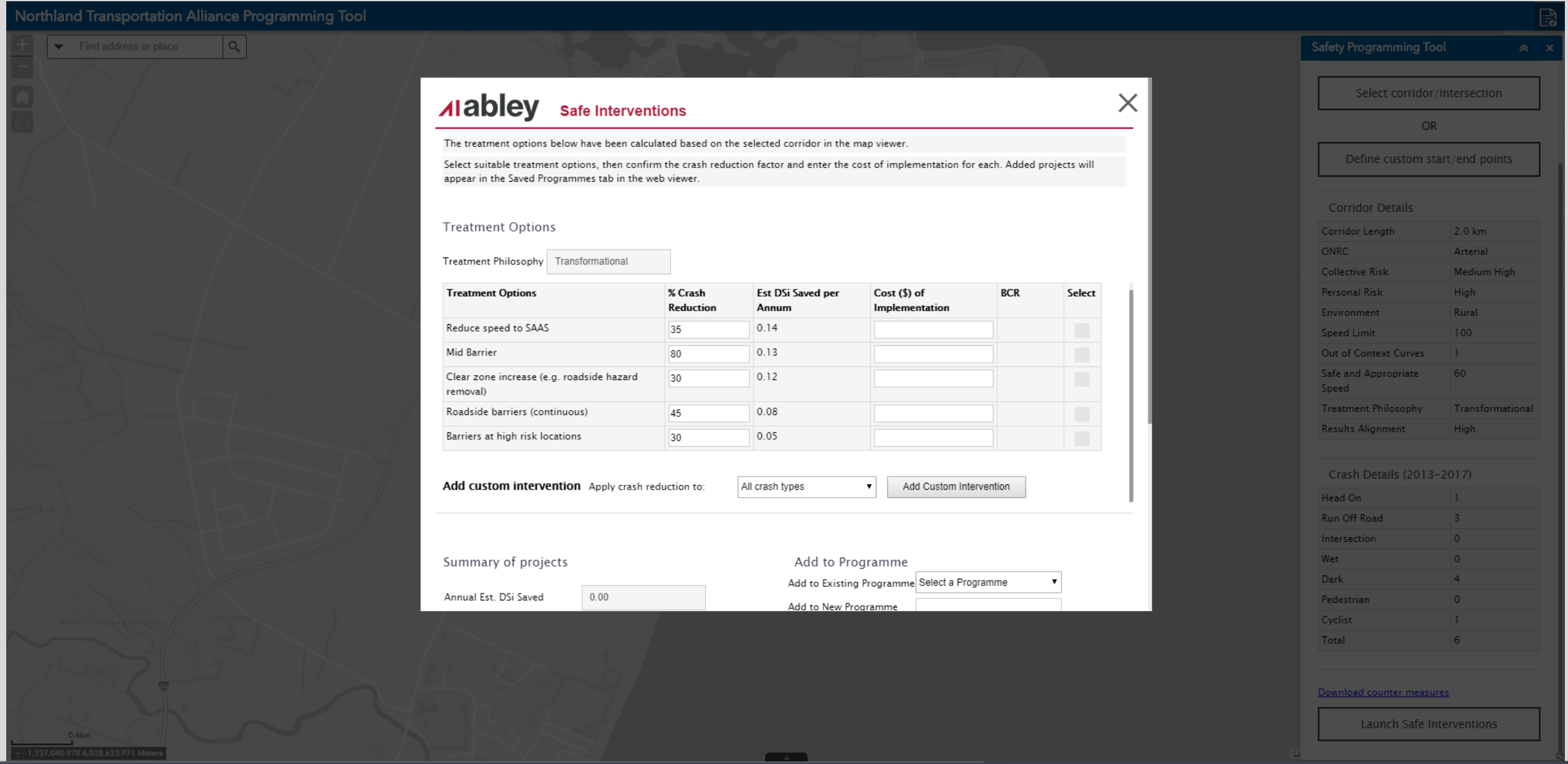
ableyl



NORTHLAND TRANSPORTATION ALLIANCE

Far North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

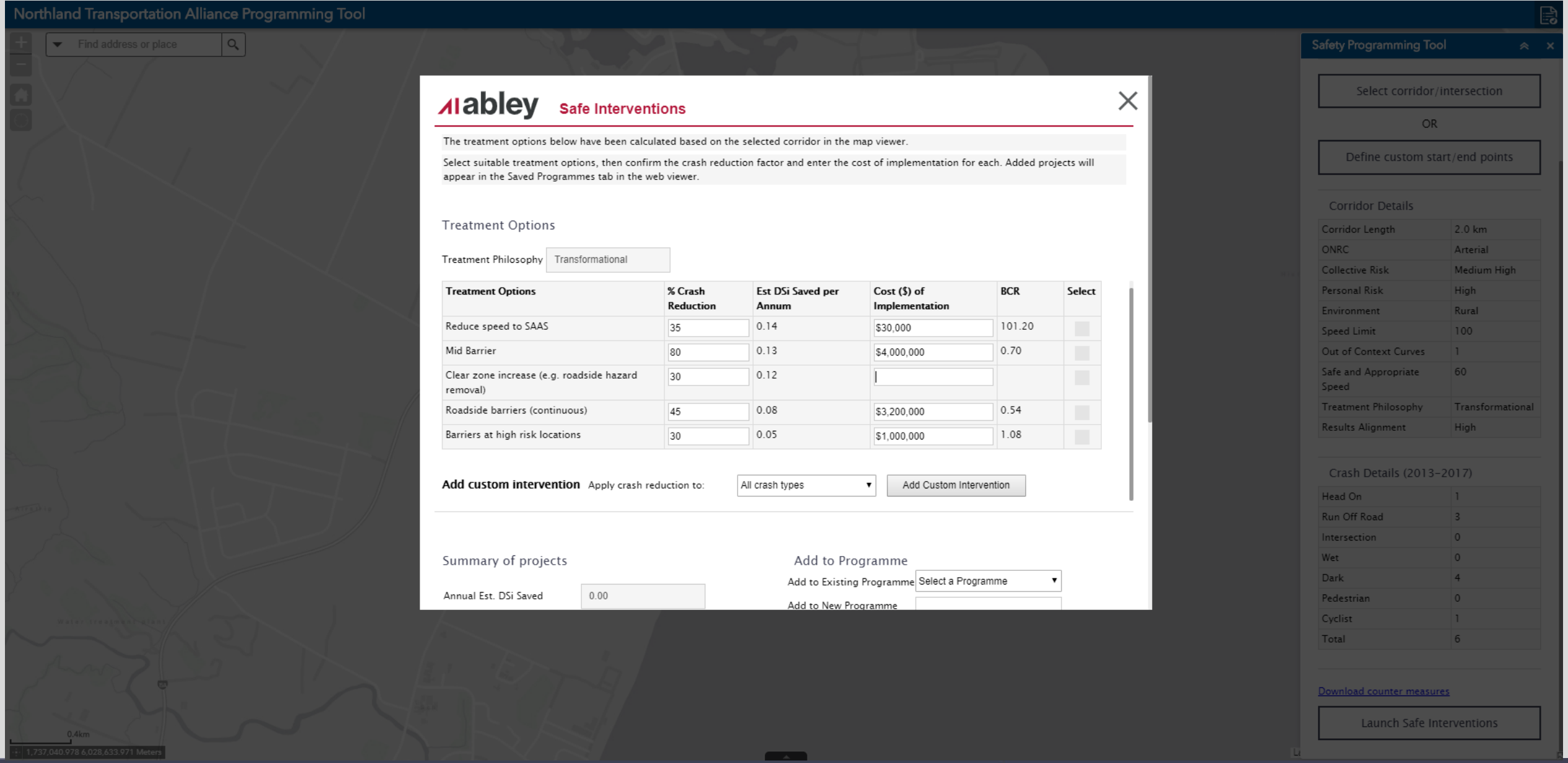
ableyable



NORTHLAND TRANSPORTATION ALLIANCE

For North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

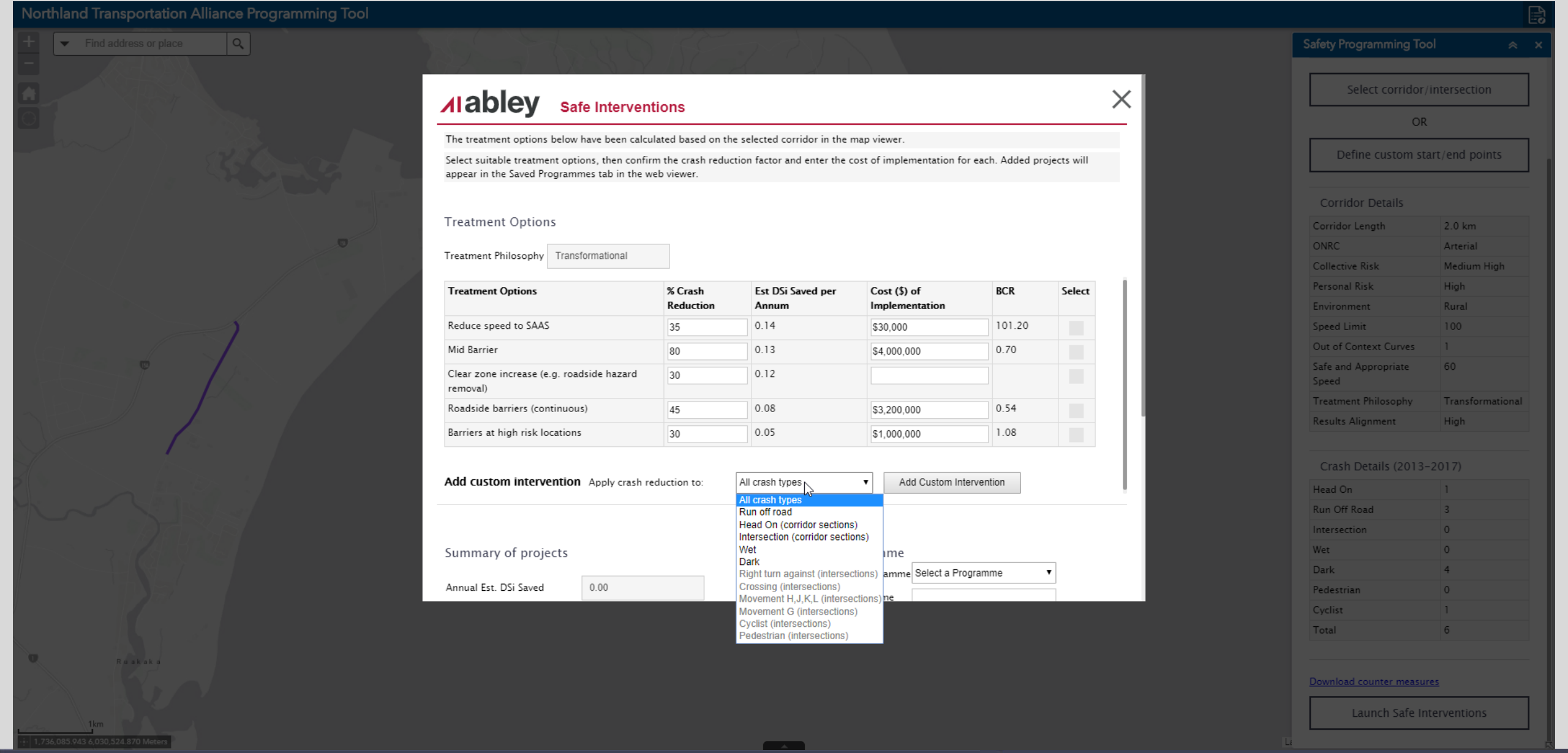
ableyAI



NORTHLAND TRANSPORTATION ALLIANCE

For North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

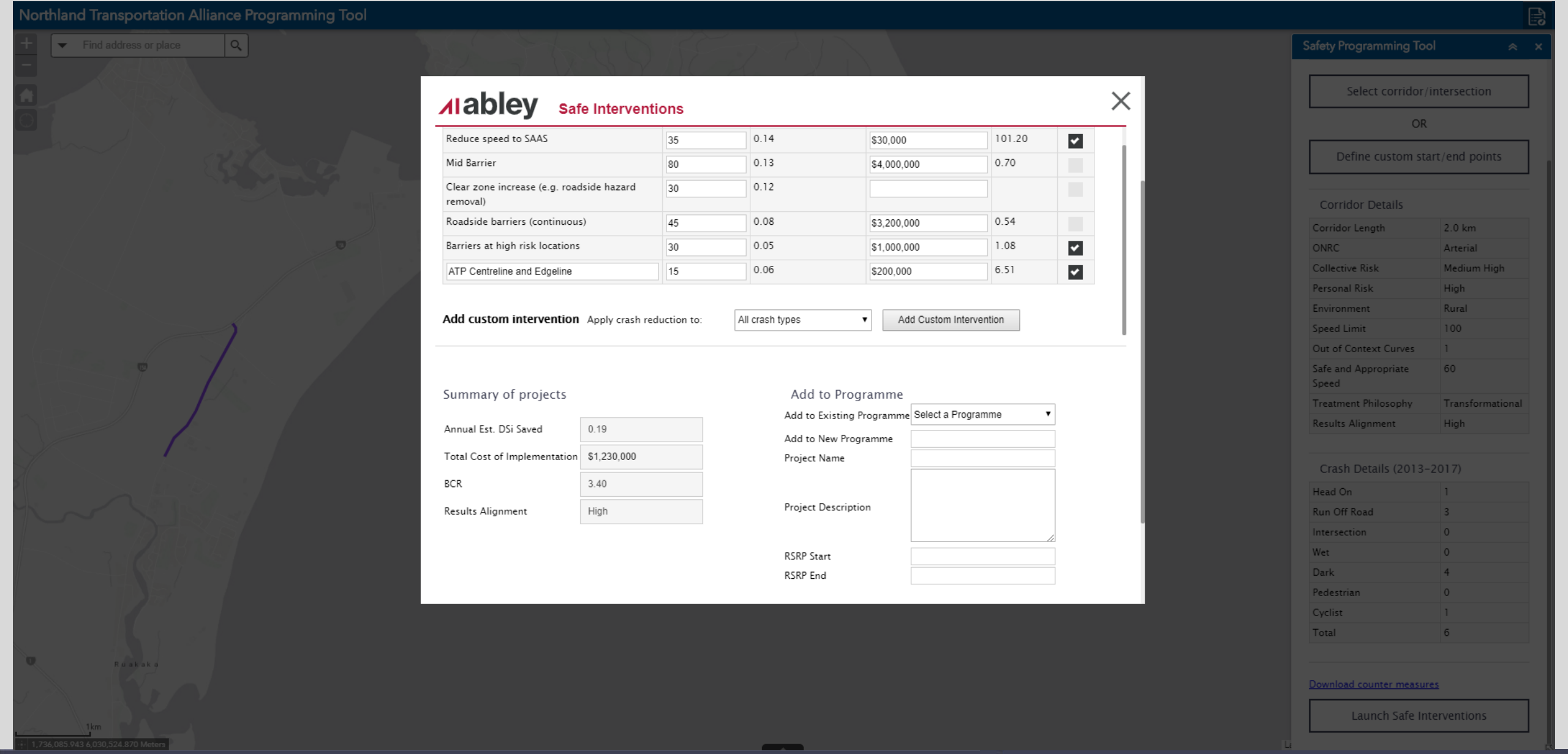
ableyable



NORTHLAND TRANSPORTATION ALLIANCE

For North District Council · Kaipara District · Whangarei District Council · Northland Regional Council · NZ Transport Agency

ableyl

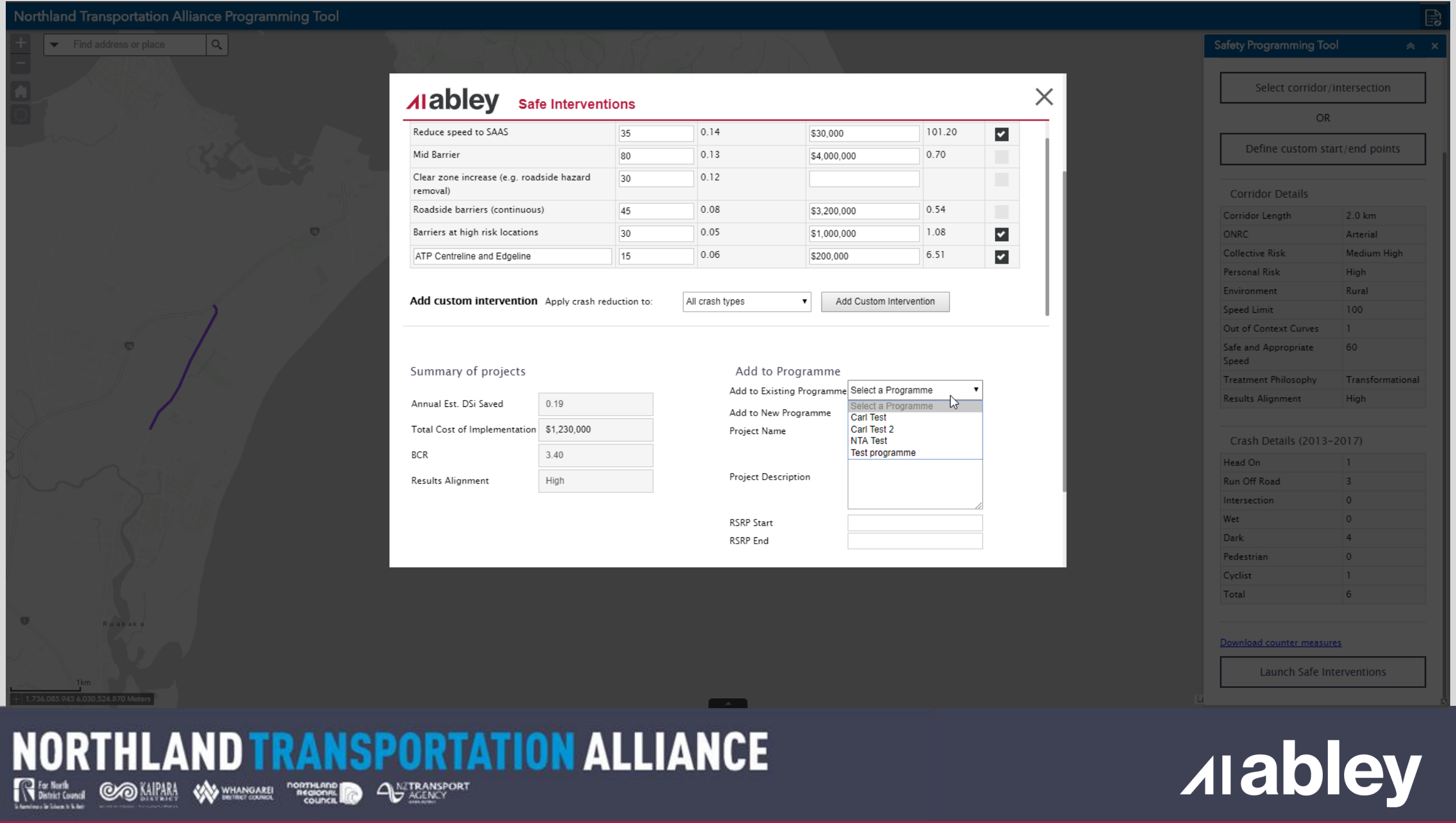


NORTHLAND TRANSPORTATION ALLIANCE

For North District Council · KAIPARA DISTRICT · WHANGAREI DISTRICT COUNCIL · NORTHLAND REGIONAL COUNCIL · NZ TRANSPORT AGENCY

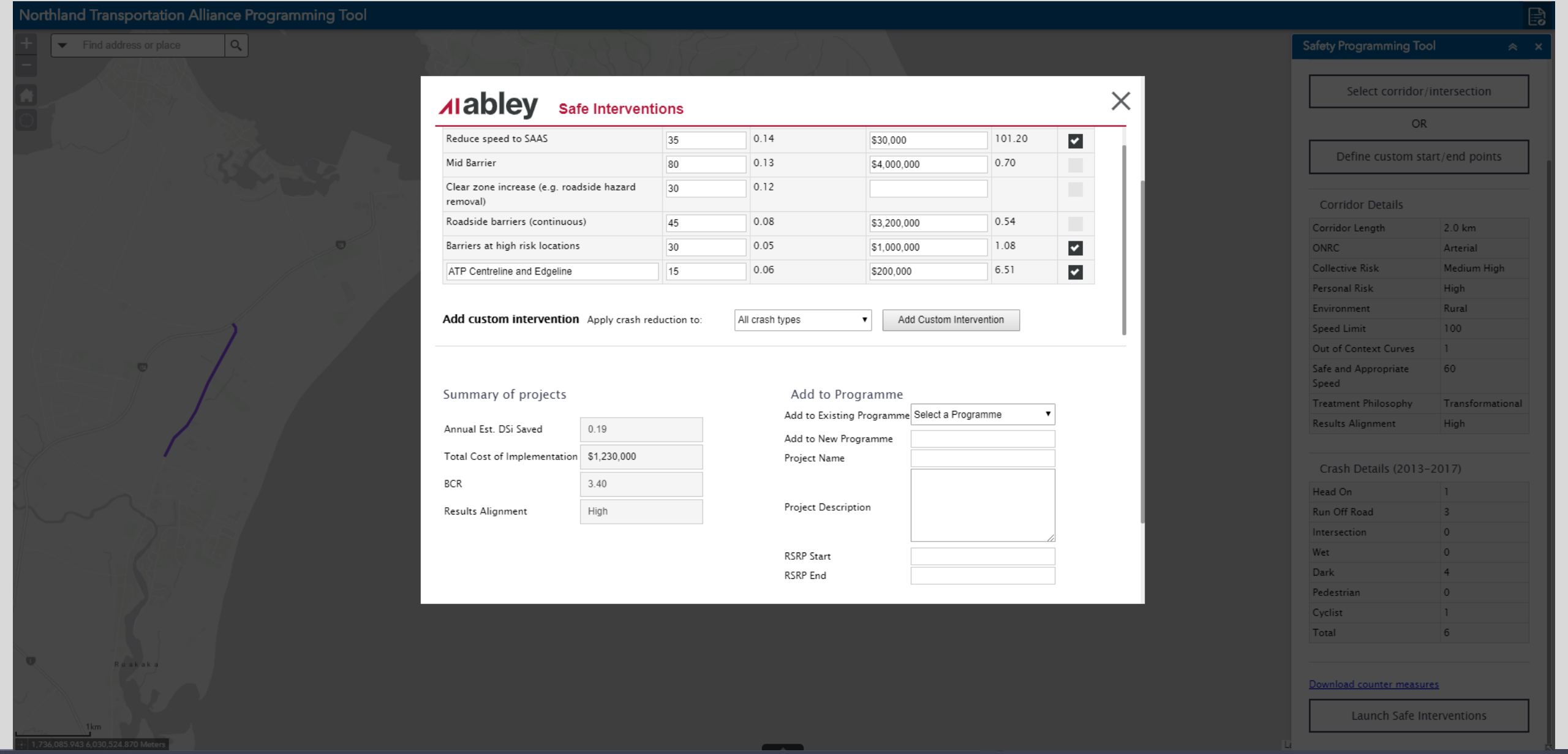
abley

Google



NORTHLAND TRANSPORTATION ALLIANCE

Able

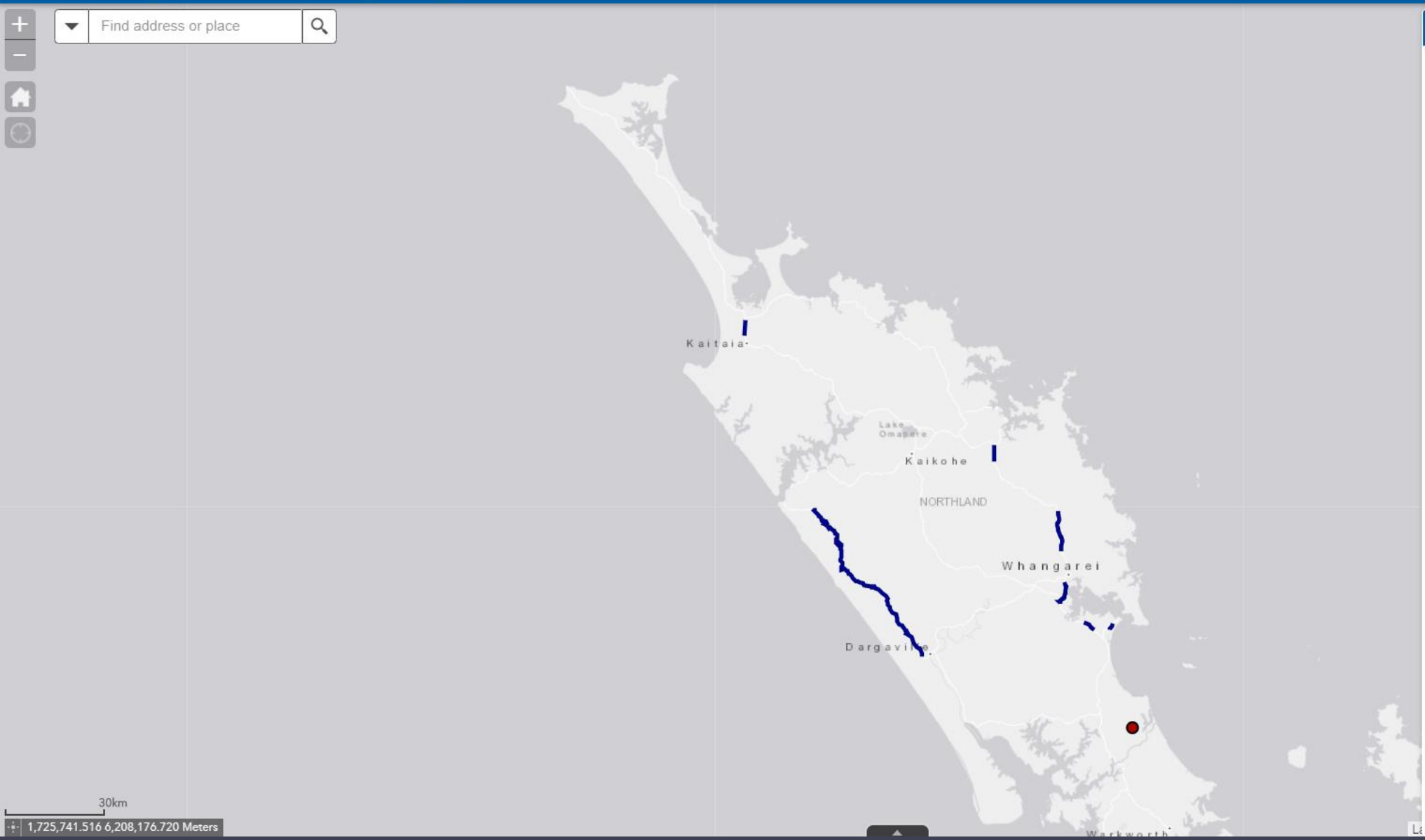


NORTHLAND TRANSPORTATION ALLIANCE

For North District Council · KAIPARA DISTRICT · WHANGAREI DISTRICT COUNCIL · NORTHLAND REGIONAL COUNCIL · NZ TRANSPORT AGENCY

abley

Northland Transportation Alliance Programming Tool



Safety Programming Tool

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.

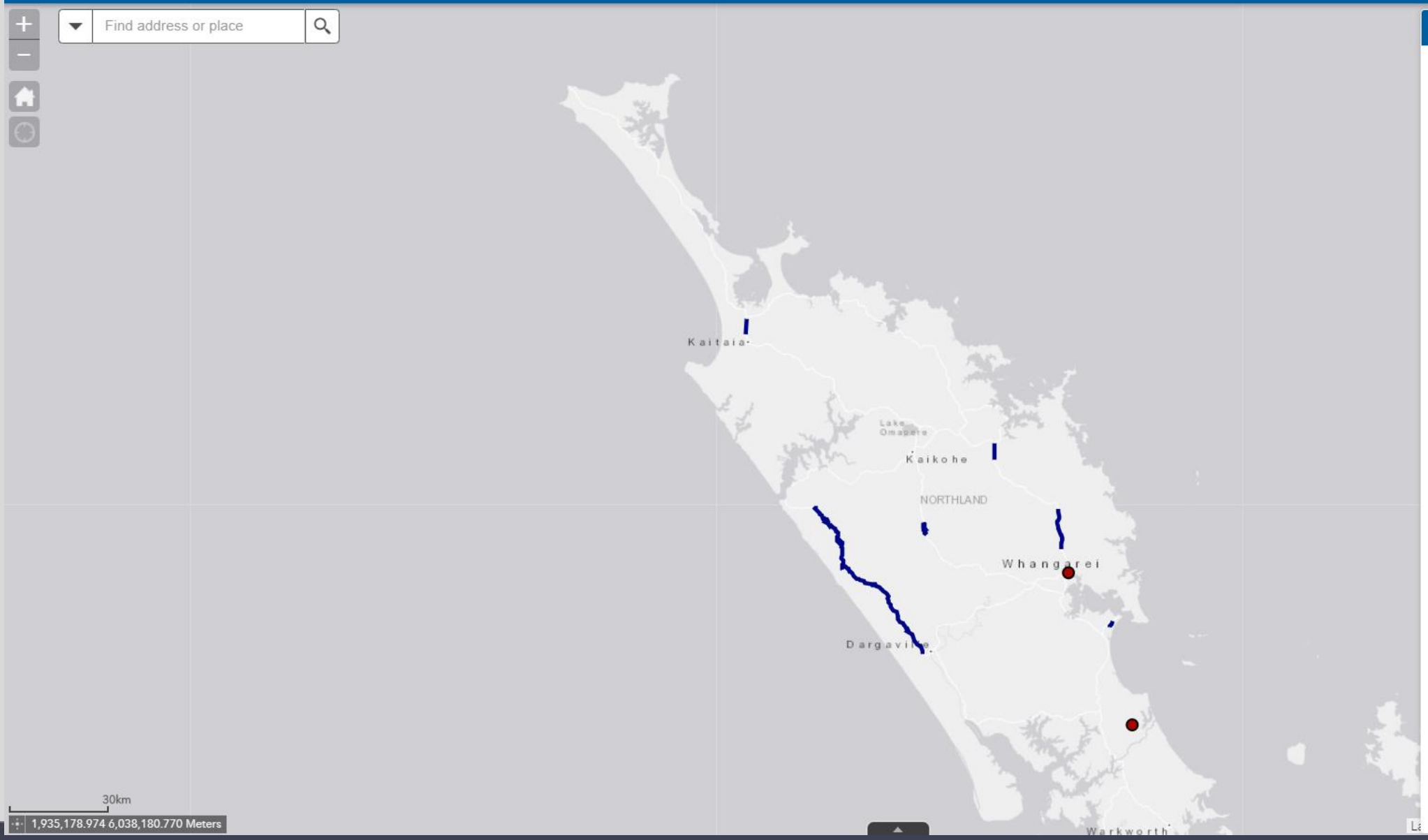
Download CSV

NORTHLAND TRANSPORTATION ALLIANCE

Far North District Council | Kaipara District | Whangarei District Council | Northland Regional Council | NZ Transport Agency

ableyable

Northland Transportation Alliance Programming Tool



Safety Programming Tool

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 VKT

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

Download CSV

NORTHLAND TRANSPORTATION ALLIANCE

Far North District Council | Kaipara District | Whangarei District Council | Northland Regional Council | NZ Transport Agency

Mabley

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