



# Using Geospatial analysis & modelling tools to make our State Highways more resilient

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<http://www.radionz.co.nz>



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# Where to prioritise?



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# Invest wisely using evidence





## In the past...



- Paper maps
- Local knowledge
- Inconsistency from region to region

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## And the focus now?

- Data gaps
- Hotspots and issues on the network
- Understand where to prioritise investment
- Future proof the data
- Visualise

# National Resilience Project

Strengthen resilience of our  
roads for our customers

Enable Great Journeys to  
keep New Zealand moving





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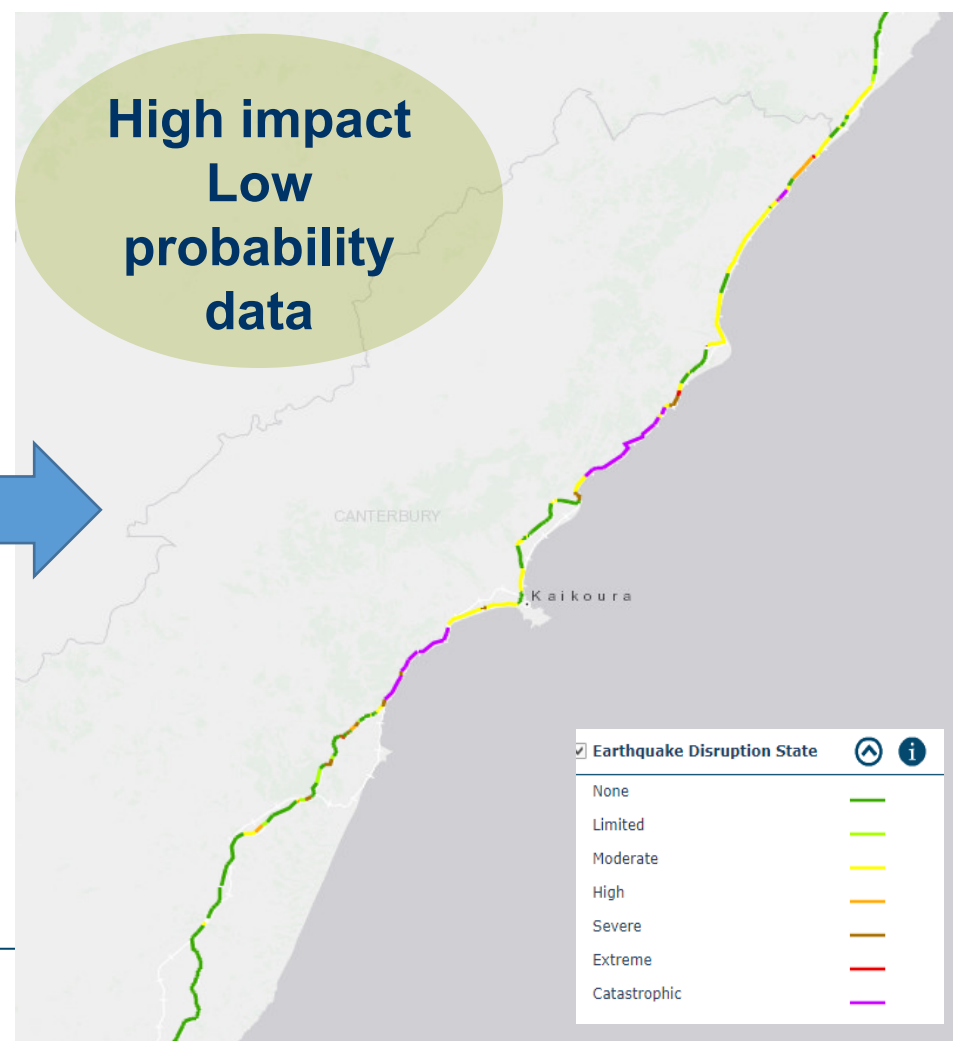
# Teaming up with our vendors



- 
- Geology, slope angles, DEM
  - Erosion, flood hazard, Sea level rise predictions
  - Fault lines, lava and lahar flows
  - Tsunami inundation & evacuation data
  - Road closure history



**High impact  
Low  
probability  
data**



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**High impact,  
Low probability data  
eg. Earthquake,  
tsunami**



**Low impact,  
High probability data  
eg. weather events**



**Road criticality**

**= Prioritisation data**



About Earthquake Storm Volcano Tsunami **Prioritisation Score**

## Resilience Prioritisation Score

A story map



### 1 Prioritisation Score (Segment Level)

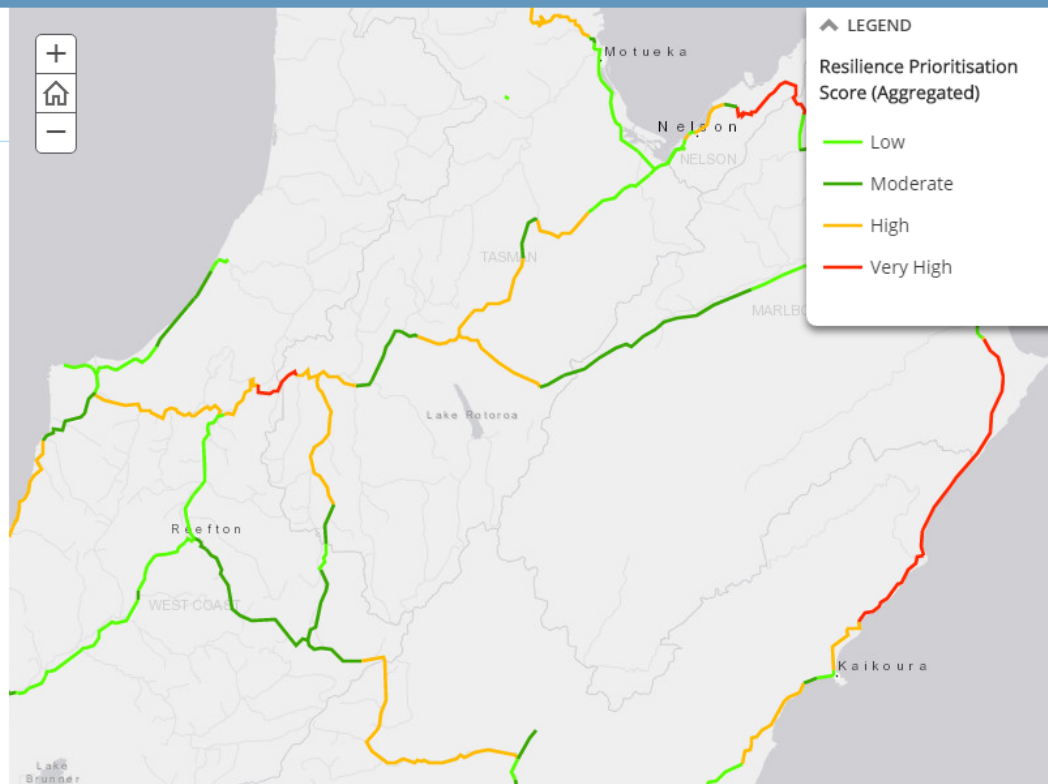
### 2 Prioritisation Score (Aggregated)

This map is intended to provide a high level view of resilience issues across the State Highway network.

The data is derived from a model that processes the following datasets:

1. Low frequency events (Earthquake, Volcano, Storm, Tsunami)
2. Resilience costs data based on network maintenance costs for key natural hazard faults (Slips, Ice/Frost, Flood)
3. The relative importance of the road segment based on the One Network Road Classification.

RP0 = Low resilience prioritisation  
RP1 = Moderate resilience prioritisation  
RP2 = High resilience prioritisation  
RP3 = Very high resilience prioritisation



#### LEGEND

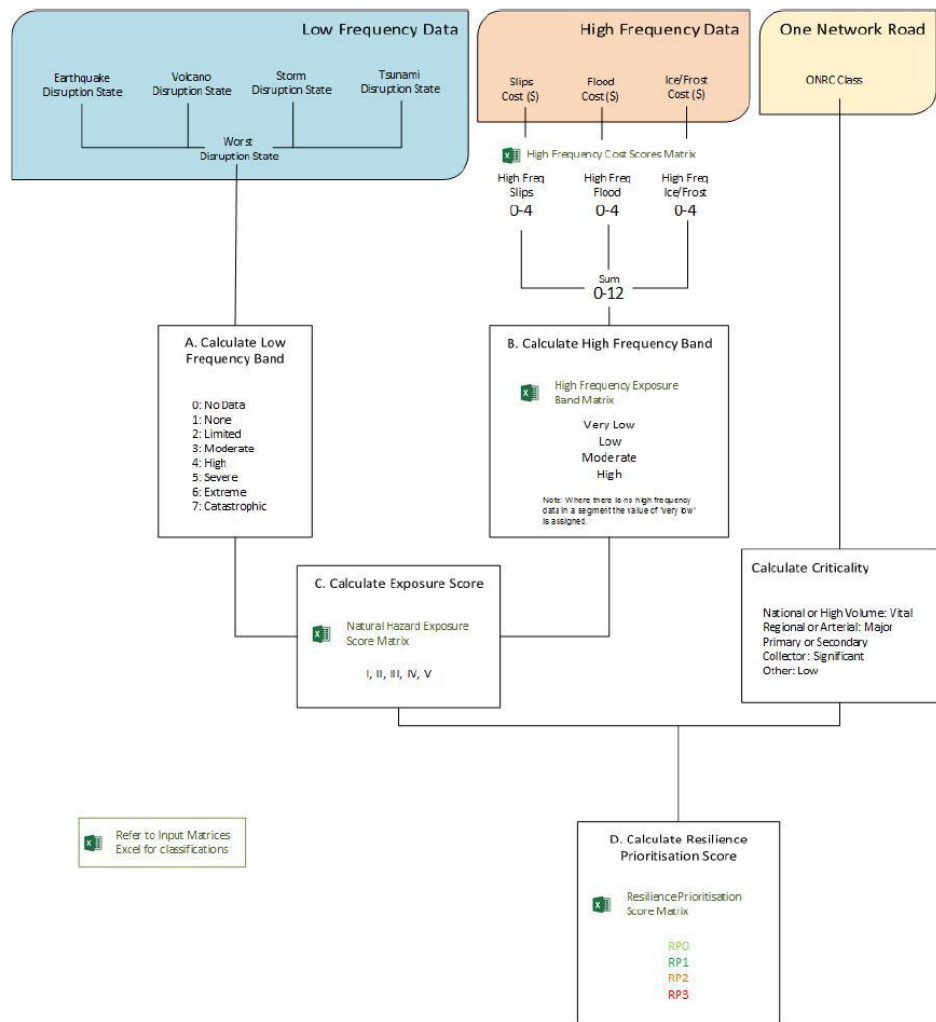
##### Resilience Prioritisation Score (Aggregated)

- Low
- Moderate
- High
- Very High



Web app builder

Story map



# Prioritisation model

# Detour routes

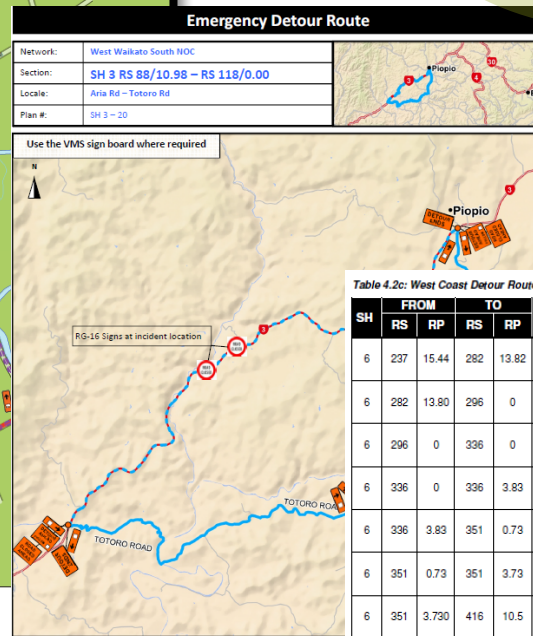
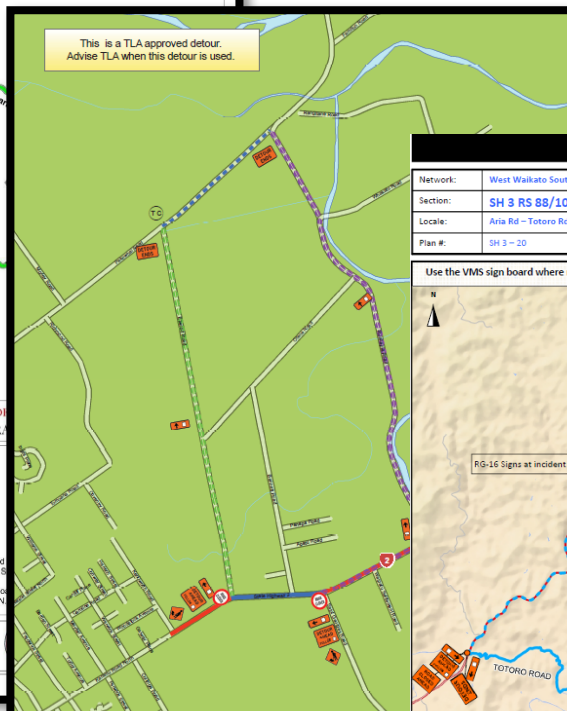
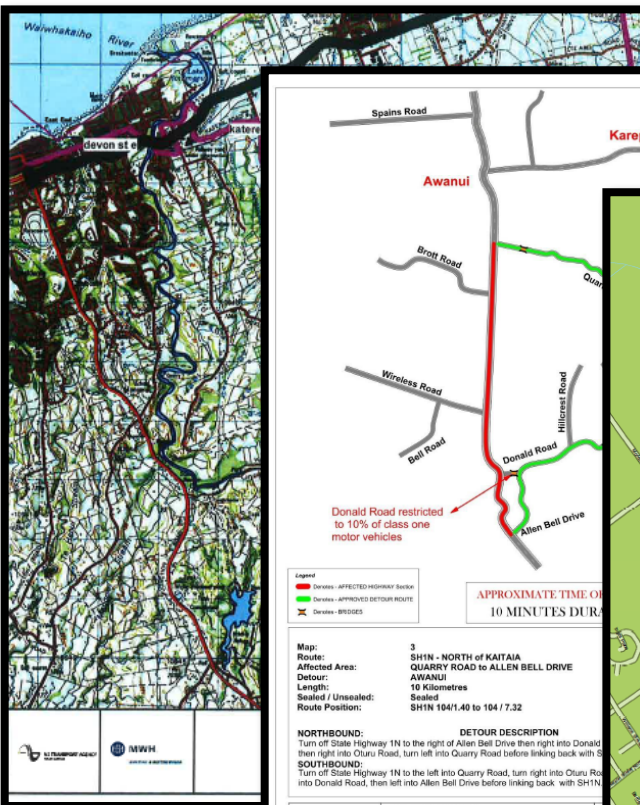


Table 4.2c: West Coast Detour Routes

SH	FROM		TO		LOCATION	ALTERNATIVE ROUTES/DETOUR TRAFFIC AT
	RS	RP	RS	RP		
6	237	15.44	282	13.82	Between the turnoff to Spring Junction and Inangahua Junction	SH 65 and 69 via Springs Junction
6	282	13.80	296	0	Between Inangahua River Bridge and Inangahua Junction	Via Brown Creek Road at Inangahua township to SH 69 at RP 0/7.58
6	296	0	336	0	Between Inangahua Junction and Four Mile Junction (Westport)	SH 69, 7 and 6 via Reefton and Greymouth
6	336	0	336	3.83	Between Four Mile Junction and Wilsons Lead Road	District roads via SH67A Cape Foulwind
6	336	3.83	351	0.73	Between Wilsons Lead Road and Beach Road turnoff	Limited alternatives via SH6, 69 and 7
6	351	0.73	351	3.73	Between Beach Road turnoff and North of Charleston	District roads via Beach Road
6	351	3.730	416	10.5	Between North of Charleston to Wingham Park Corner	Limited alternatives only around Runanga otherwise via SH 6, 69, 7



SH 2 Coastal Closure/ Detour Route  
St Georges  
St Georges Road to Ellwood Road





## SCARGILL VALLEY ROAD, WAIKARI VALLEY ROAD

Start Location	SH1/Scargill Valley Rd Int
End Location	SH1/Mount Cass Rd/Waipara Flat Rd Int (Waipara Junction)
Extra Time	11.0 mins
Extra Distance	17.9 km
NOC Area	North Canterbury
Detour No.	Sec20-Pg522.7
Surface	Sealed, Metalled
One Way Flow	No

[Download source reference](#)

### Key

- Official route
- Selected route
- Detour for selected route

# Detour routes



Home > Roads and rail > Highways Information Portal > Technical disciplines > Resilience >

## Resilience planning tools

As we learn more about how our road network holds up to possible unexpected disruptions and other unexpected disruptions, we better understand where we need to invest - both to increase its resilience and to provide better indicators and predictors of potential disruption.

This page provides a range of tools and tips in a business case context to help develop interventions and agreed responses to improve the resilience of networks. It also provides nationally consistent information on the risks of high impact low frequency events (such as earthquakes).

These tools help us and our suppliers identify and evaluate resilience risks and issues, and their likely impacts as well as prioritise potential responses.

### Resilience evaluation process

This process map will help assess the resilience issues on a network. It contains links to various tools and resources that will help you build a business case for investment.

These tools are aligned to the business case process. Depending on the scale and nature of your problem a minor improvement (less than \$300k), or enhanced resilience (more than \$300k) may be a more appropriate response. Funding application forms for these can be found on the [resources and information](#) page.

Please note that this page, and the guidance and tools it contains, will be updated regularly in the coming months. If you have any questions or need further information, please contact [resilience-infrastructureplanning@nzta.govt.nz](mailto:resilience-infrastructureplanning@nzta.govt.nz).

### Resilience in the strategic business case

This note [PDF, 434 KB] gives examples and insights using a resilience lens on the planning process and can be used by anyone developing a strategic case to incorporate resilience into their assessments.

One stop  
shop

# Benefits

- Improve experience for our customers
- Transparency, Informed decisions
- Increase network availability
- Informed decisions
- Easier
- Consistency

*“Geospatial has helped to deliver significant innovative improvements in delivering customer outcomes around resilience.”*

- Stuart Woods, Resilience Project Manager

*“...Ability to blend and manipulate diverse location based data sets to prioritise risk areas.”*



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# Thank you for listening

**For further information:**



[spatial@nzta.govt.nz](mailto:spatial@nzta.govt.nz)



[nzta.govt.nz/](https://nzta.govt.nz/)