

For the rebuild of Devil's Elbow, we considered using the existing rail corridor or building a new road near the railway line. We have looked at various options within the light blue area on the map (right).

The Napier - Wairoa rail line has suffered massive damage in the cyclone due to wood debris, fallen trees and major landslides. There are over 400 damaged sites. Many of these are not accessible or visible from the road. The scale of the damage is high and any work in the rail corridor will be challenging.

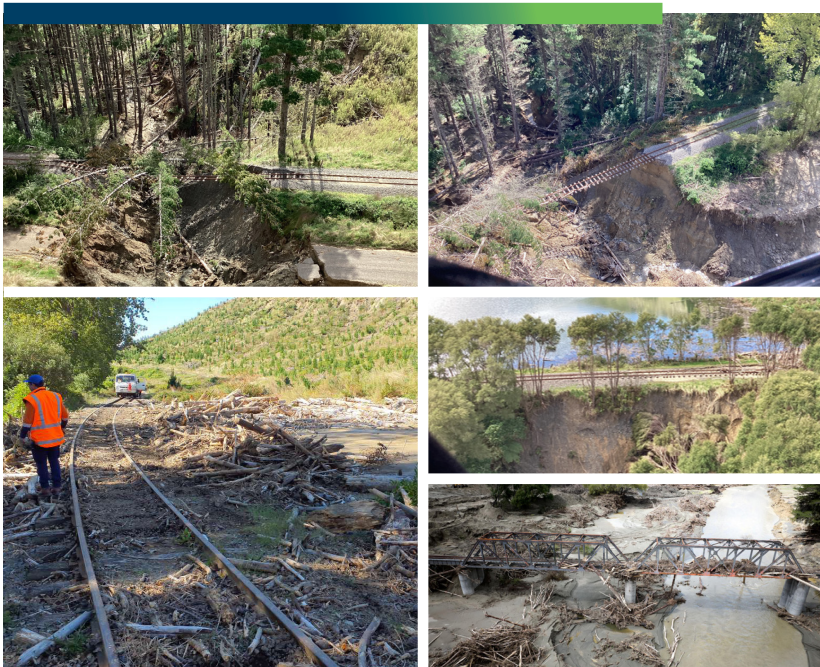
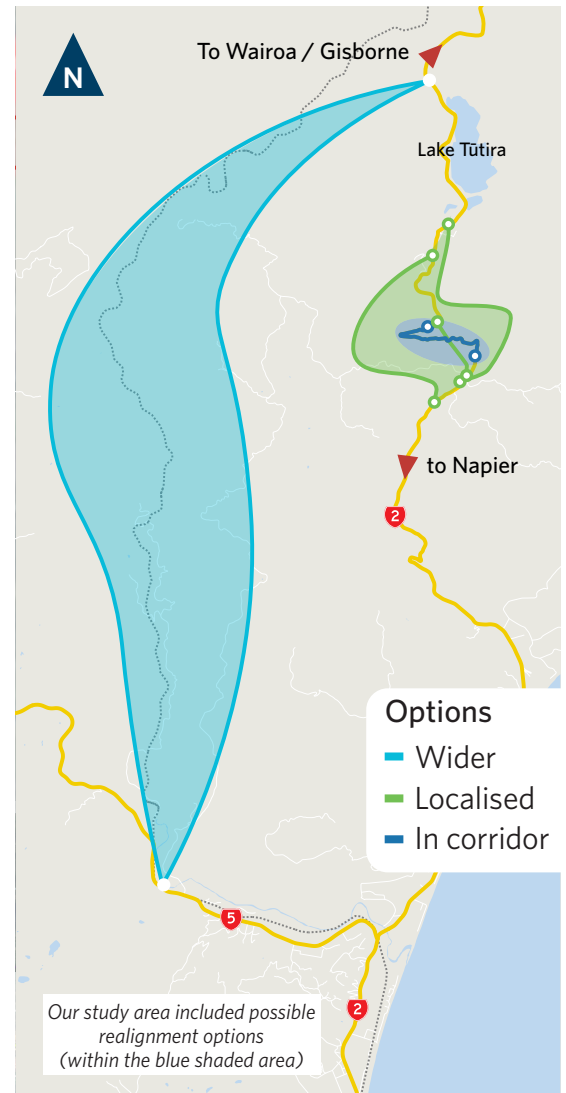
About the rail corridor

(Munns Creek/Eskdale to Tūtira)

This 27km section navigates through very rugged terrain, with steep gradients and winding river valleys. The rail corridor traverses a steep, 200m to 300m high slope.

There are 3 tunnels up to 220 metres long, and 3 major bridges, including one viaduct. It is single track and, in some sections, less than six metres wide. The ground varies between bedrock and deep deposits of landslide debris including large boulders of limestone.

The Napier-Wairoa line was mothballed from 2012 to 2020 and hasn't been operational since Cyclone Gabrielle. Ongoing maintenance is needed to protect it from further decline.



Rebuild and resilience projects are subject to NZTA Board endorsement and funding.

The challenges of building a bypass option

We have considered options of varying outcomes, including low and high speed roads.



Converting the rail corridor

Building a new alignment would require KiwiRail agreement first and involves significant work. The current rail corridor would need to be widened to 15-50m.

Including:

- Cutting and stabilising slopes
- Large retaining structures
- 15 or more large debris-resilient culverts or bridges
- Expansion of tunnels
- Replacing, upgrading and double-laning existing bridges.



Earthworks

The route would require approximately 4 million cubic metres of earthworks. For comparison: 2.5 million cubic metres are 1,000 Olympic-sized swimming pools.

- Material would need to be carted off site and deposited.
- For in-corridor upgrades of Devil's Elbow we are expecting less than 1 million cubic metres of earthworks.



Property impact

Approximately 40 landowners would be affected by land acquisition.



Construction timeline

This project would take 10 years, including land acquisition, consenting, detailed design and construction.

Further extreme weather/seismic events could cause ongoing disruption and increase the construction timeline.



Costs

The new road would be approximately 26km long with costs ranging from \$1.5b to \$2.4b. The existing highway would need to be transferred to the council and as a local road will need to be repaired and maintained by council.

While bypass options generate higher benefits than in-corridor options, like reduced travel time and higher level of resilience with an additional route.

When we monetise these benefits, we see maximum benefits of \$570M. This results in a low benefit-cost ratio, a poor return on investment.

In comparison: The in-corridor option is around a \$330-\$446M dollar investment relative to around \$380-\$410M dollars in benefits.

The in-corridor option provides a step change in resilience to the current road and justifies the investment.

Findings from our investigation

The region needs urgent action, but we are competing with other regions' needs. The community expects a reliable and resilient road network and investment is needed to support the economy and the quality of life in the Hawke's Bay and Tairāwhiti.

	In-corridor solution (our focus)	Bypass solution
Benefits 	<ul style="list-style-type: none"> Repairs the localised and small scale drop out failures at Devil's Elbow Significantly lower costs (ca. \$400m) A step change in resilience that aims for lane closures only in larger events (not full closures) Widening of 70% of the road, retaining structures, a new bridge at Devil's Elbow built to modern standards and drainage upgraded to meet current standards Economic Benefits (\$380-\$410M) A small group of affected landowners Shorter construction time (3 years) No significant change of travel time, but reduced disruption once improvements are completed 	<ul style="list-style-type: none"> Doesn't climb as high so overall won't be as steep Resilience and safety benefits through new alignment and additional route (requires ongoing maintenance of Devil's Elbow) Travel time savings of up to 2-5 minutes for heavy vehicles and 8-10 minutes for light vehicles (Wairoa-Napier journey) - reduced fuel consumption and carbon emissions Reduced disruption due to offline construction
Dis-advantages 	<ul style="list-style-type: none"> Construction disruption due to work on the existing road corridor Reliance on a single corridor with limited alternative routes 	<ul style="list-style-type: none"> Due to the geology of the area, likely to have similar high risk of slips as the existing highway (or will result in a high cost to reduce risk of slips) High cost (multiple billions) not economically justifiable with \$570M in benefits Significant environmental effects to mitigate A larger group of affected landowners Long implementation and construction time (10 years) Potential disruption on existing road until opening of new road

Conclusions

We know from our consultation with communities, partners and stakeholders that there is significant support for bypassing Devil's Elbow.

With projects like Devil's Elbow, we need to calculate the overall value for money, comparing the value of the benefits with the costs of the project. Whilst the bypass option has higher benefits than in-corridor options, its costs are significantly higher and are difficult to justify.

The low traffic volumes, around 2,500 vehicles per day, places limits on the scale of benefits. The bypass option is therefore not our recommended option.

In-corridor solutions are relative low-cost solutions while still significantly improving resilience.

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Whakapā mai ■ Get in touch

Visit our website

nzta.govt.nz/trec

Email us

info@trec.nz

Call us

0800 80 TREC (0800 80 8732)

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