Epitaph - building before the storm:

proactive infrastructure for SH6 on the West Coast

NZ TRANSPORT AGENCY
WAKA KOTAHI

Te Kāwanatanga o Aotearoa
New Zealand Government

Presenters

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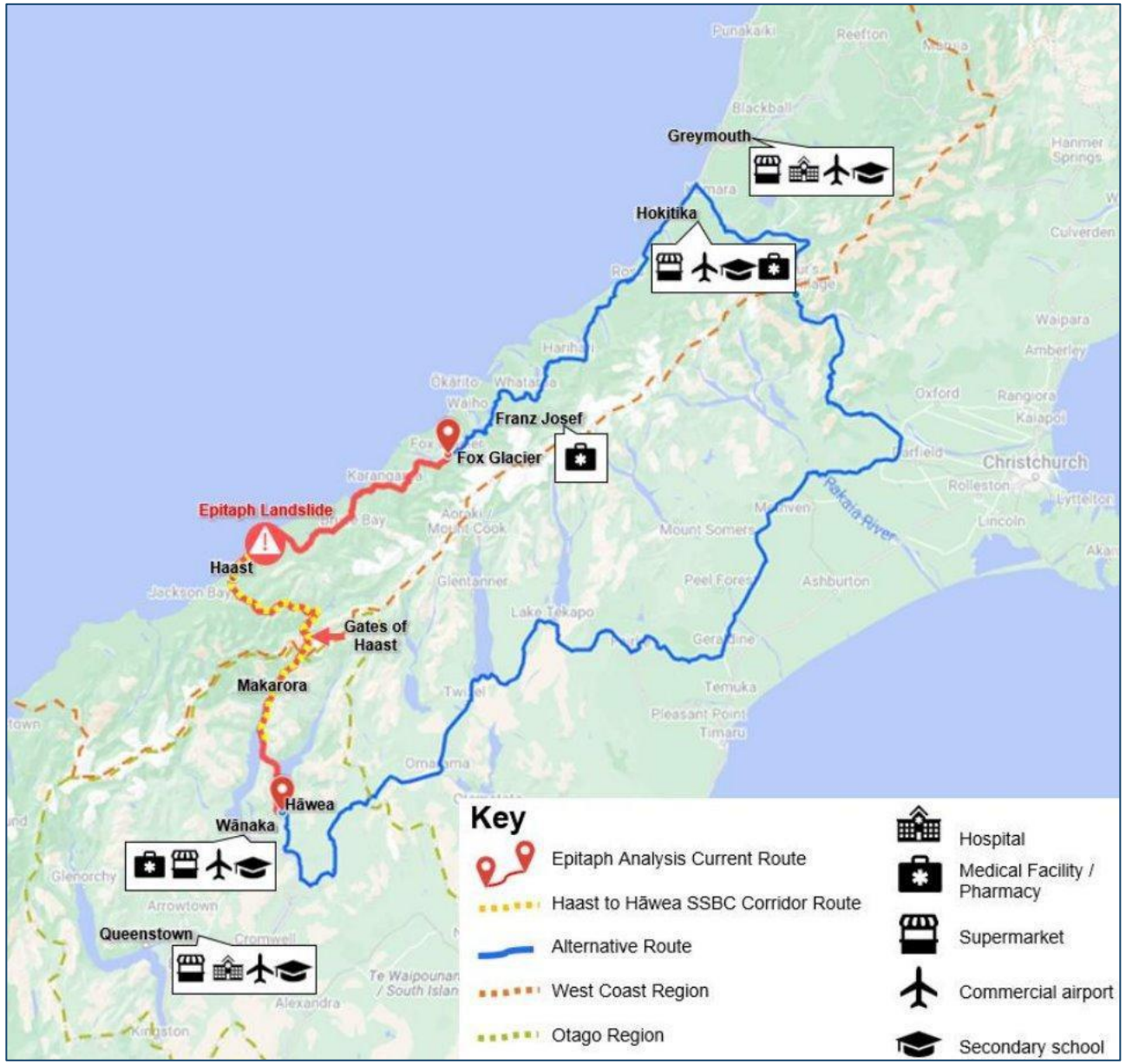
Presentation outline

- Context and the problem
- The resilience approach:
  - Immediate – emergency response (clearing and make safe)
  - Short term – monitoring + micropile
  - Long term – investment case

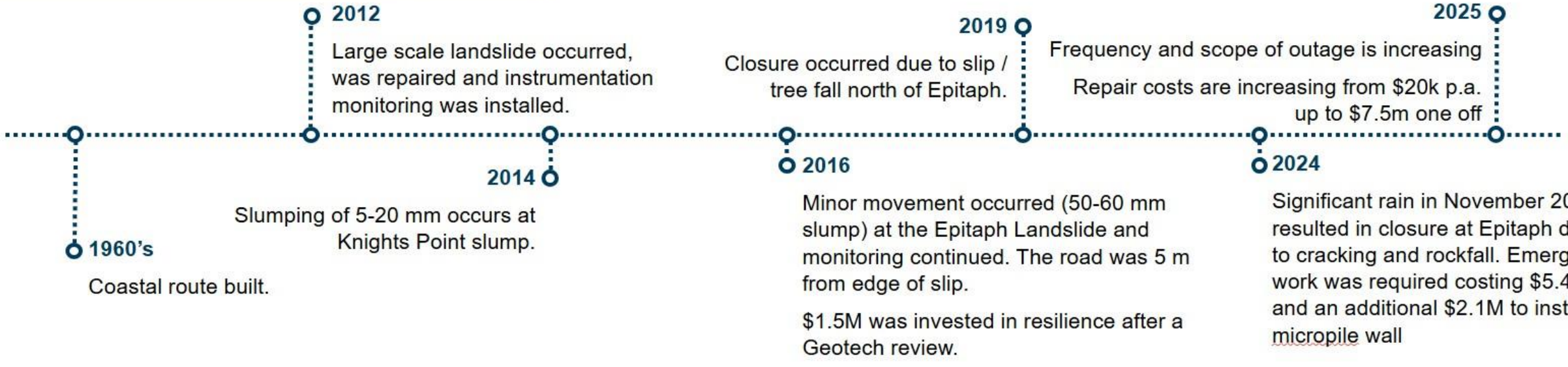
Context

- A single route with no viable alternative.
- A very remote location.
- High rainfall, earthquake prone, mountainous, highly active coastal environment.
- Low traffic volumes, but critical connection for local communities and a key tourist route connecting the West Coast to Otago and Southland.



The problem

Timeline



The problem

- Epitaph Rift

Overslip active since 1990. 60m wide and 70m high. Regularly monitored and scaled, had spot bolts, but rockfall still occurs regularly following heavy rainfall.

- Northern deep landslide

Active since 2014. In 2024 had 115mm of vertical displacement.

- Southern shallow landslide

Initiated in 2012. Ongoing regression at the toe and towards the edge of the state highway.

Immediate response

Short term response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Google Earth

Monitoring

- Extensometers, drainage flow meters, rain gauge, cameras, TARP signal beacons, earthquake monitoring.

Note: Yellow extensometers proposed but yet to be installed

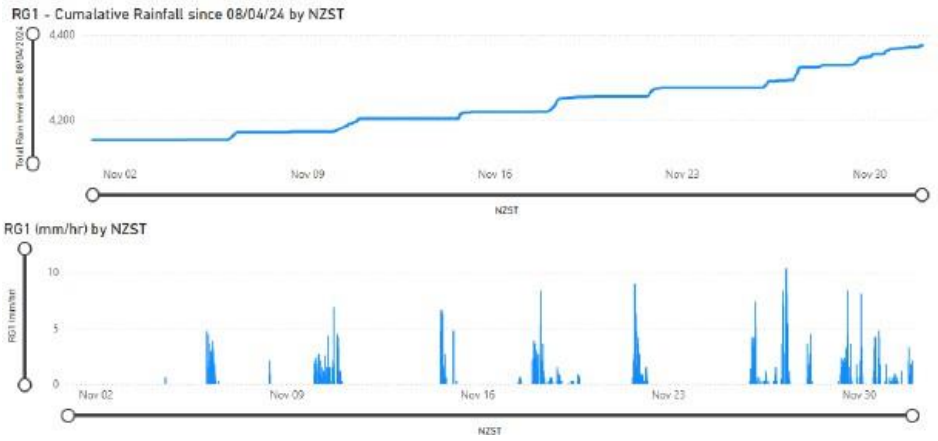
Monitoring

- Challenges with equipment being wiped out by weather or construction.
- Limited sun impacts solar powered equipment – replacement of batteries difficult due to location.

Extensometer Data Long Term trends

Ext 5 – 6 July 2025 (end of wall construction) – 30 Oct 2025

Rainfall data for the last month (1 Nov – 30 Nov)



223.00

Cumulative Rainfall (mm) during sliced period

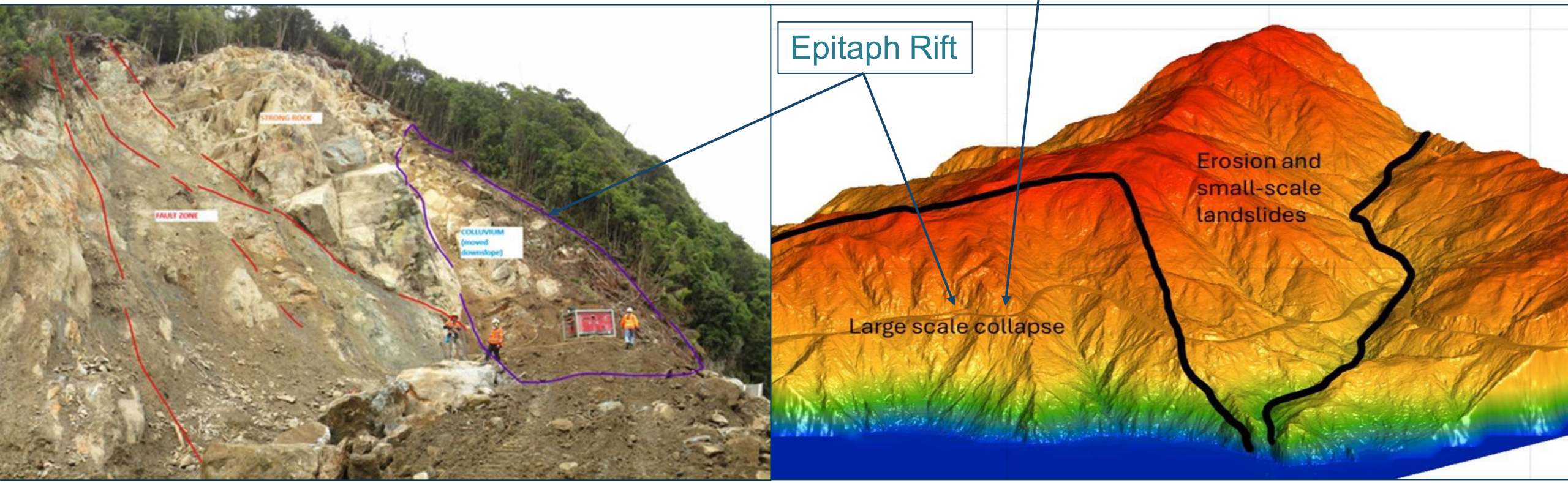
Long term response

Key impacts


Fox Glacier to Hāwea Alternative Route (compared to current):
+516 kilometres
+6 hours 3 minutes
Arthurs Pass
$60-90 million estimated in local tourism business disruptions for a closure spanning one month.
$8.5 - $17 million in additional road user costs for a closure spanning one month.
Fox Glacier
Increased total exposure to sections of the state highway network that have higher collective and personal risk to road users.
Social severance for local communities when accessing important district healthcare services and education opportunities.
Haast
Broader local, district, and regional economic and business costs.
$3.1 million in additional vehicle operating cost for freight vehicles for a closure spanning one month.
Hāwea
A large-scale landslide would likely cause the full loss of two lanes, considered possible (1 in 10 years) with an expected closure duration of >6 months
Continued regression of road shoulder is considered likely (1 in 5 years) and would likely cause an expected closure duration of 1 to 6 months.
Possibly at road edge by 2032 (1.1 m/2 yrs)
Aug 2024
Sept 2022
Sept 2012
4.5 m
1.1 m
?
GHD, Draft Hazard Assessment Report, October 2024
Key
Current corridor route
Alternative route
Hazard description
Closure impacts

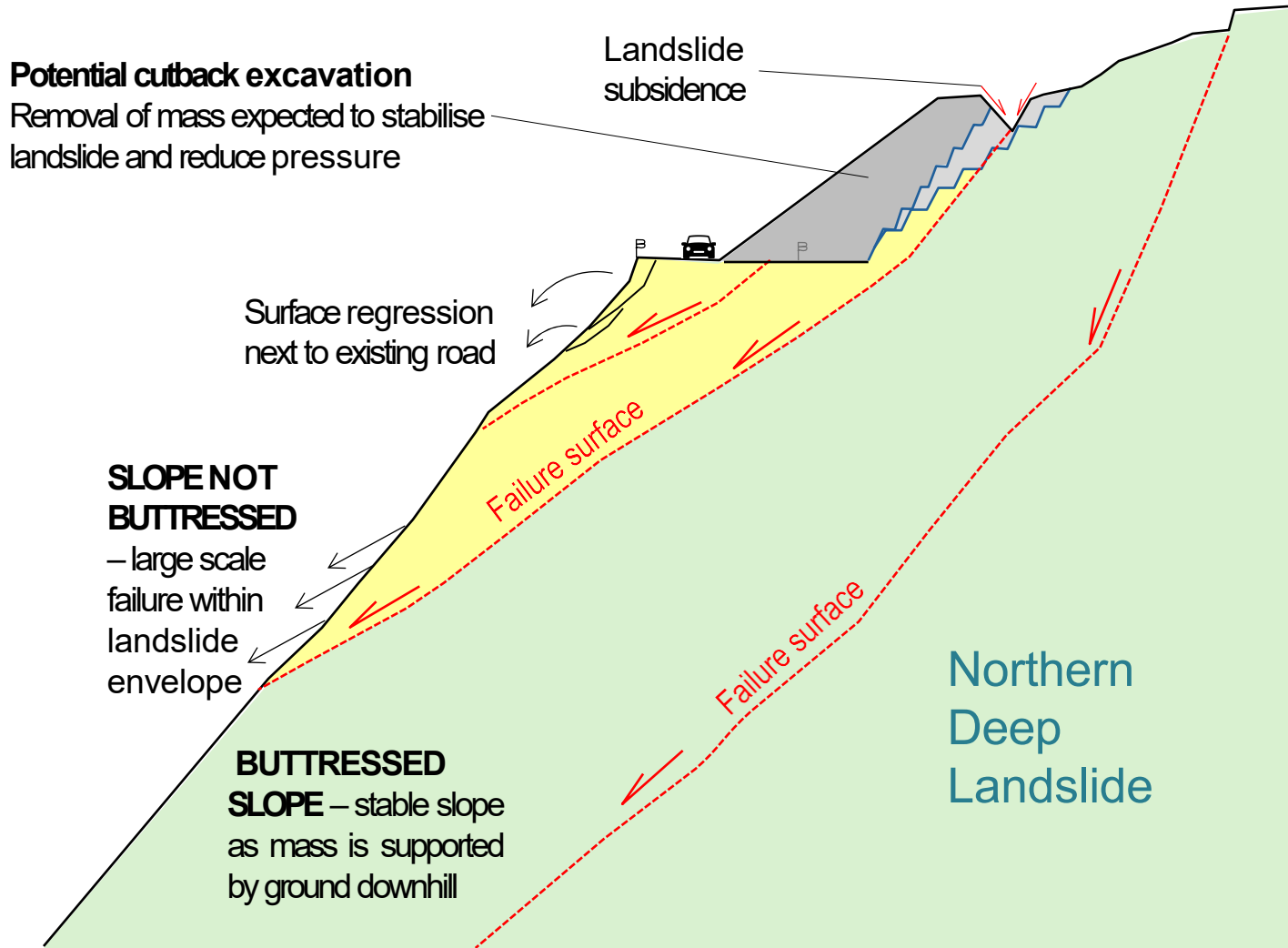
Underlying causes

- Large geological features
- Constant pressure and increasing rainfall



Potential long-term failure profile

- Projection of past erosion rates indicates the southern shallow landslide could undermine one or both carriageways within about 5.5 years if progression continues steadily.
- Longer term there will be total undermining of the road.

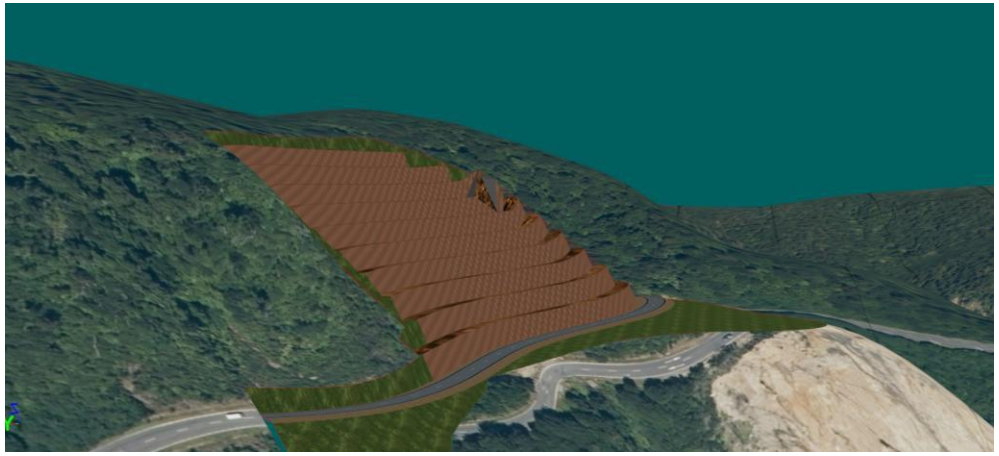


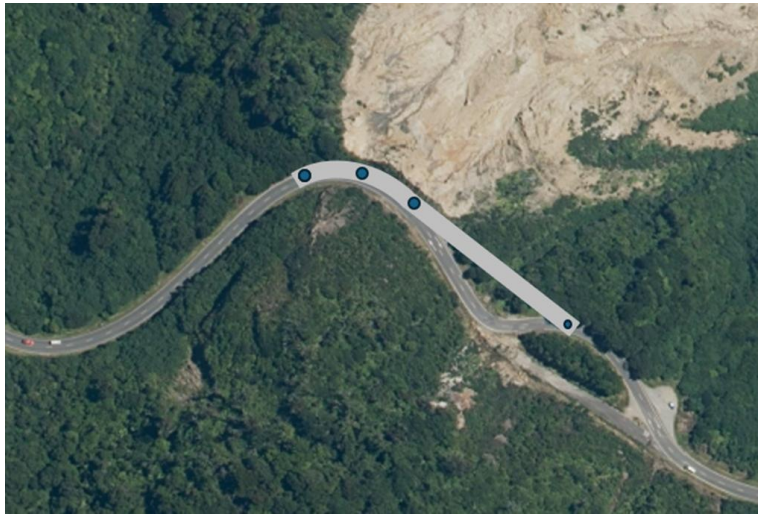
Why is this a good investment for NZ?

- Strengthens resilience by reducing NRAT risk ratings from critical and medium to medium and low, lowering the risk of disruption.
- Protects a key transport corridor by improving slope stability and relocating the highway away from an active landslide, reducing the likelihood and duration of future closures.
- Improves reliability of access for communities, freight and visitors, supporting connectivity between the West Coast and Otago.
- Supports reliable access to emergency services, improving response capability for communities north and south of the site.
- Provides economic certainty for local businesses by reducing disruption-related losses compared with the Do Minimum scenario.
- Supports tourism growth by improving the perception of reliable access, which is critical for attracting and retaining visitors and sustaining regional employment.

- Resilience benefits valued at $49.4 million (discounted).
- Travel time savings valued at $20.8 million (discounted).
- Vehicle operating cost savings valued at $155.3 million (discounted).
- Benefit Cost Ratio in excess of 6 with sensitivity tests over 10

Options considered





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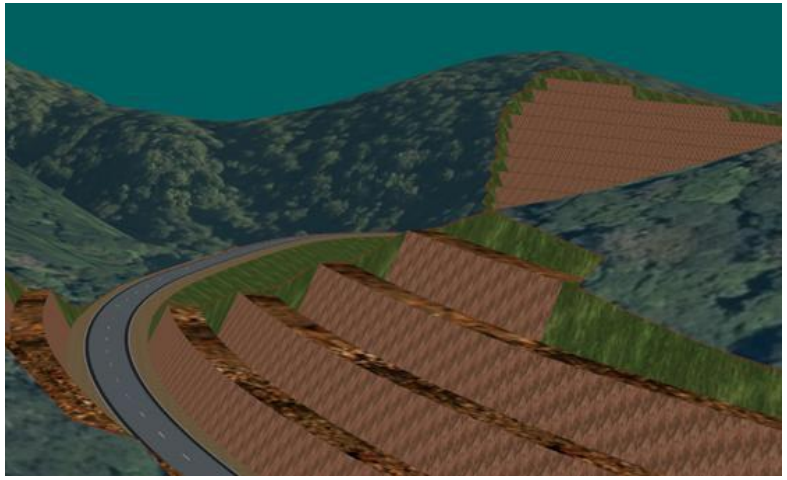

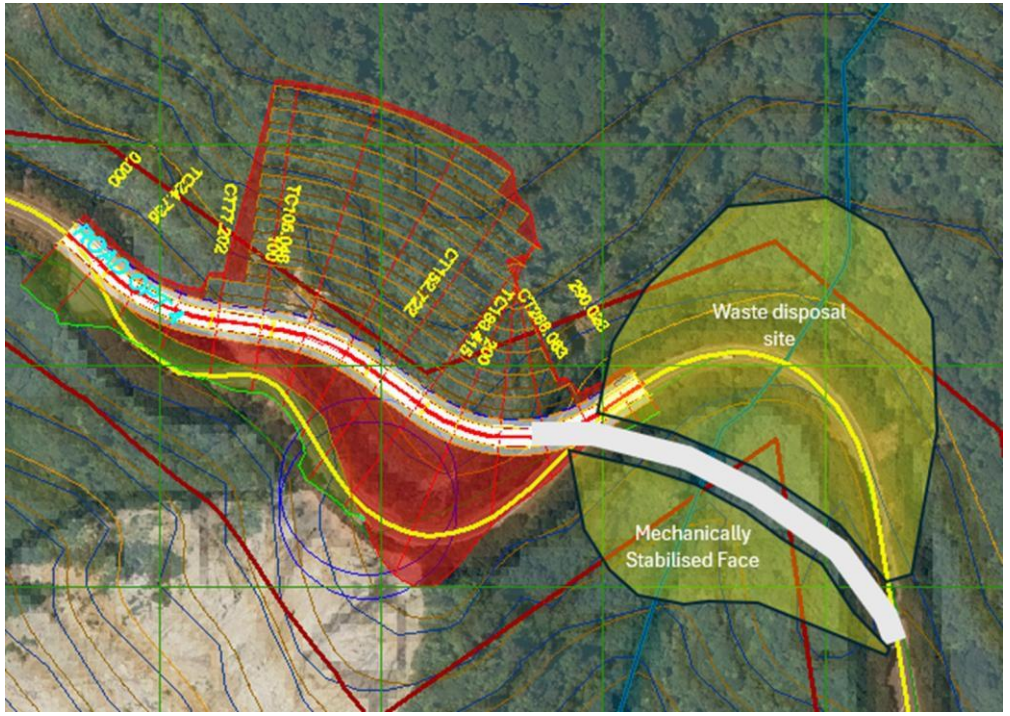

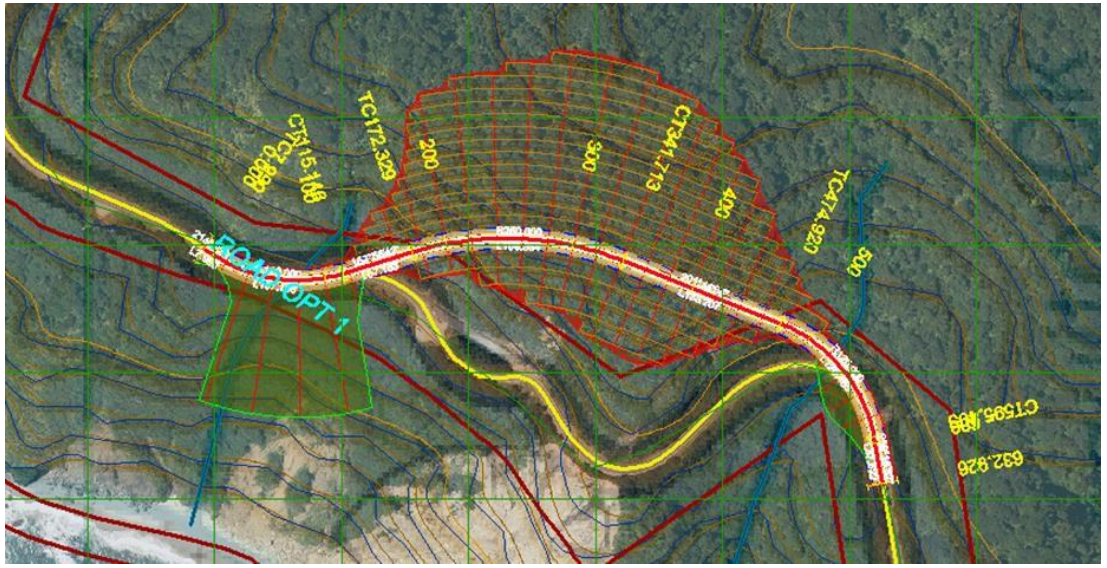

Indicative design

Thank you