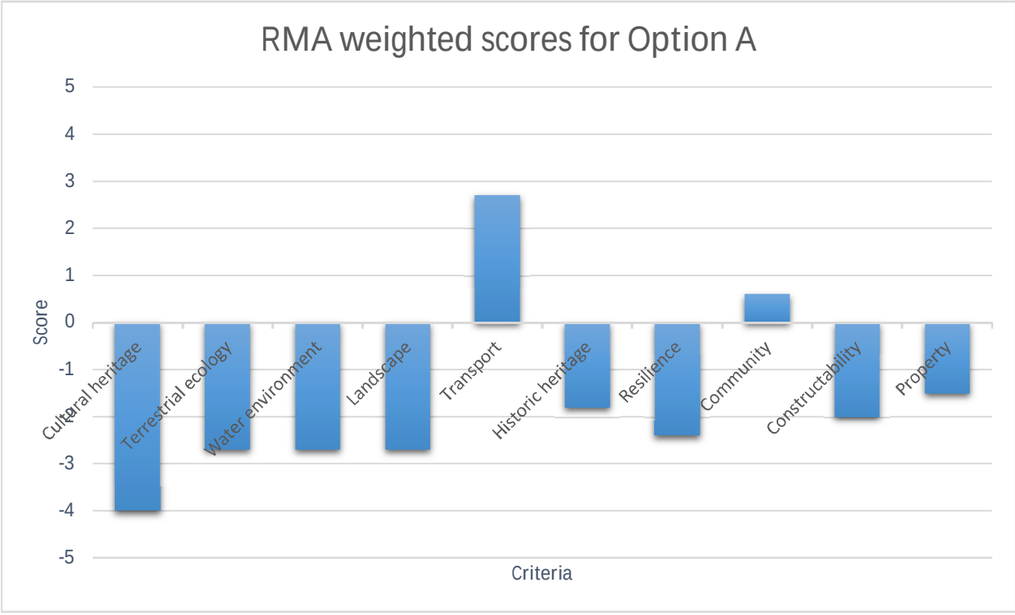
Option A

Figure 1: View towards Option A's long bridge across Waipingao Valley

Figure 2: View along Option A towards the northern tie in to State Highway 3 (SH3)

Description and overall comments

- The most direct realignment route, with the smallest footprint and shortest travel time
- This option involves a tunnel through the northern ridgeline of the Waipingao Valley and a very long, straight bridge (610 m) across the Valley itself (see Figure 1)
- The northern end of Option A has been shifted out of the valley floor to respond to geotechnical issues, and two bridges have been added (see Figure 2)
- Improved resilience by shifting northern end out of the valley floor, but long bridge with the southern abutment adjacent to landslide is highly challenging to construct
- Most disruptive on the Waipingao Valley and the coastal to highland vegetation progression, so scored poorly from an ecological and cultural perspective
- Closest to the release site for kokako, one of the key subcriteria for cultural and terrestrial ecology scoring
- Located in regionally significant landscape area, and disrupts key southern ridgeline landscape feature.



Cultural heritage

Impact on significant Parininihi land, and closest to the kōkako release area.

Terrestrial ecology

Ranked second lowest after F, due to severance of key forest sequence from coast and the quality of vegetation.

Water environment

Smaller stream length, but high value in the Waipingao Valley and connected to marine reserve so needs robust erosion and sediment controls, such as discharging water elsewhere.

Landscape

Key issues identified were the regionally significant landscape in the footprint and the cut to the southern ridge.

Transport

Best score for transport - most direct and therefore safety and time benefits.

Historic heritage

Lowest score out of all of the alignments, as it is the closest to the coast where most archaeology is likely.

Resilience

Scored poorly, with the longer bridge with abutment on landslide material vulnerable to earthquakes and a large steep rock cut.

Community

Impacts recreation land; noise not a major issue; minimal localised social impacts and some wider benefits.

Constructability

A number of changes since MCA1 but still difficult to construct, particularly because of the much longer bridge.

Property

Scored relatively poorly due acquisition of Ngāti Tama land. Severance of Anglesey land requiring significant compensation.

Option E

Figure 1: View towards the north along option E

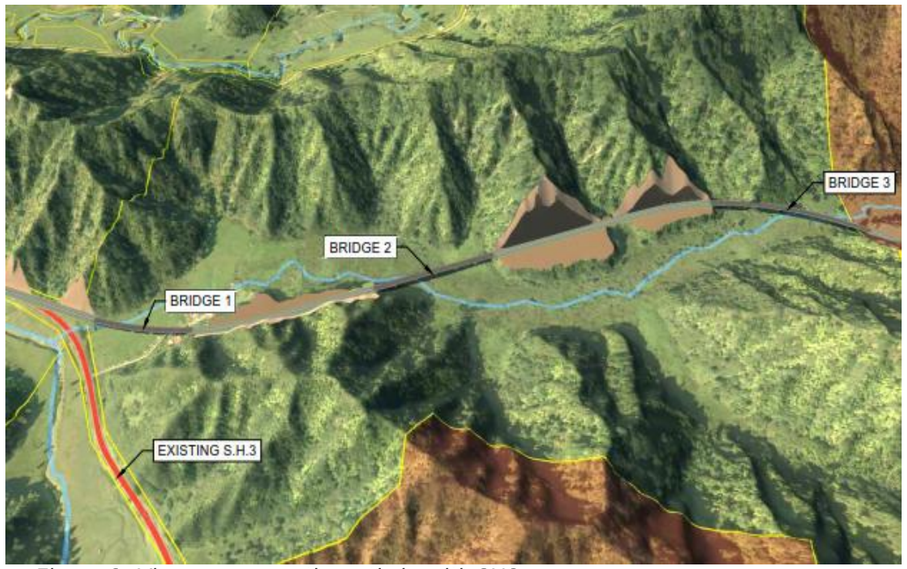
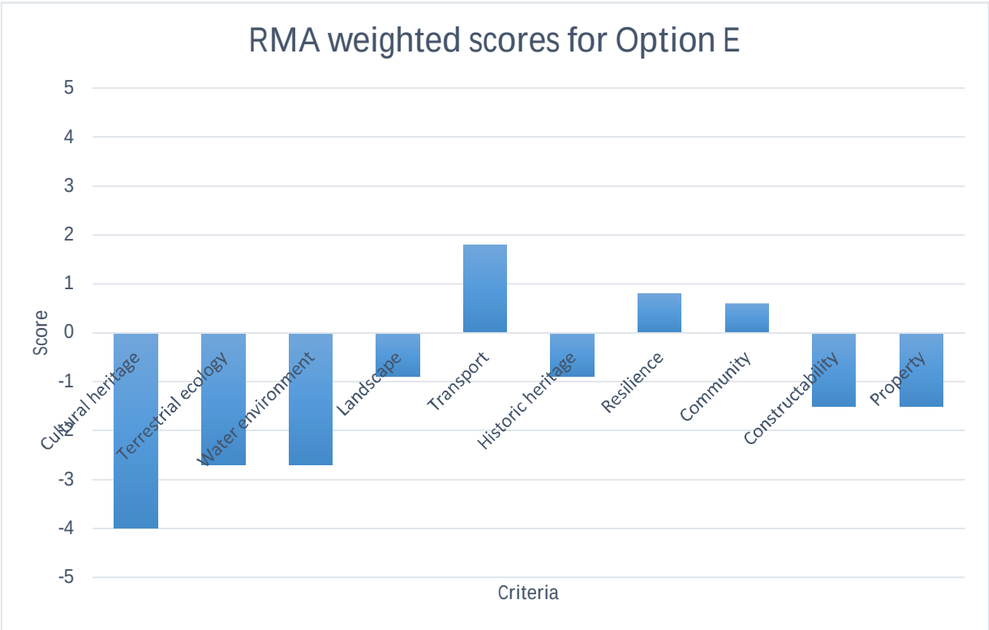


Figure 2: View across northern tie-in with SH3

Description and overall comments

- Follows SH3 at its southern end, has been shifted away from the swamp forest and a bridge added to reduce impacts
- Runs into tunnel portal east of the peak of Mt Messenger before traversing northwards along the Mangapepeke Valley
- Series of bridges along this Valley used to respond to geotechnical issues
- Shifted away from high value swamp forest and new bridge to reduce ecological effects
- Avoids key landscape, ecological and cultural features in the vicinity of the Waipingao Valley and Mt Messenger
- High potential for improvement of the surrounding environment given its degraded state in areas, particularly in Mangapepeke Valley where opportunity to revegetate, manage pests and connect Ngati Tama land
- Opportunities for improvement, including access to the top of the Mangapepeke Valley to improve constructability and programme. Bridge 5 (southwest of Bridge 4 in Figure 1 above) could also be replaced with a fill and still be located outside the adjacent wetland area



Cultural heritage

Still a considerable area of Ngāti Tama land required, although away from Mt Messenger peak and kōkako.

Terrestrial ecology

Second best score, large area but lower value habitat along Mangapekapeka Valley, although still close to swamp forest.

Water environment

Away from Waipingao Valley which is a positive, but longer corridor and wetland particularly sensitive to sediment loading.

Landscape

Scored the best alongside Option Z, given the already modified area around SH3 and the Mangapekapeka Valley.

Transport

Scored well, with passing lanes in both directions benefiting travel times.

Historic heritage

Average score – no recorded archaeological sites within corridor.

Resilience

Scored average, avoids the landslide, and the bridges across the valley floor reduce liquefaction risk. A number of culverts serving large catchments.

Community

More limited effect on recreation land than those to the west, although noise and social impact on Pascoe property.

Constructability

Scored relatively poorly due to length, bridges in Mangapekapeka Valley, and difficulties in accessing works up the Valley.

Property

Lowest scored option, requires Ngāti Tama land, and Pascoe dwelling would need to be removed or demolished.

Option F

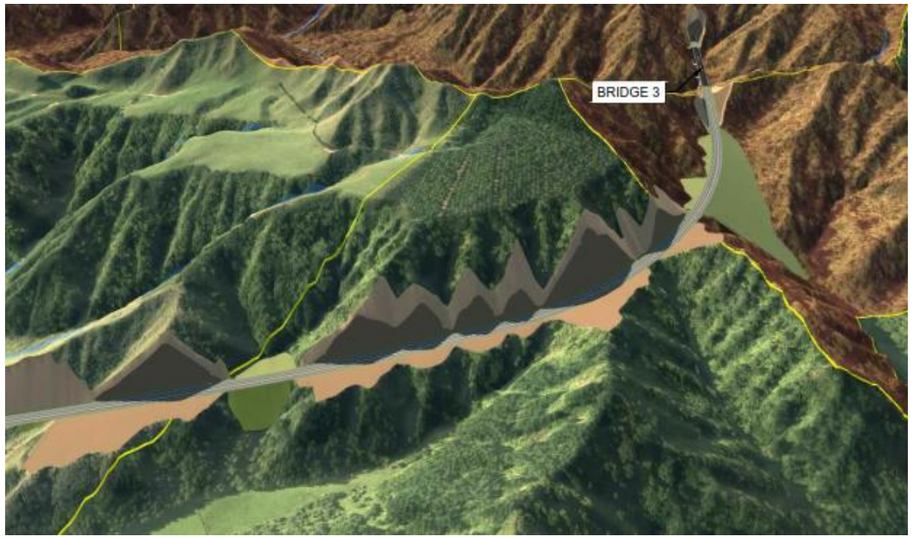


Figure 1: View towards the north along Option F towards bridge and tunnel

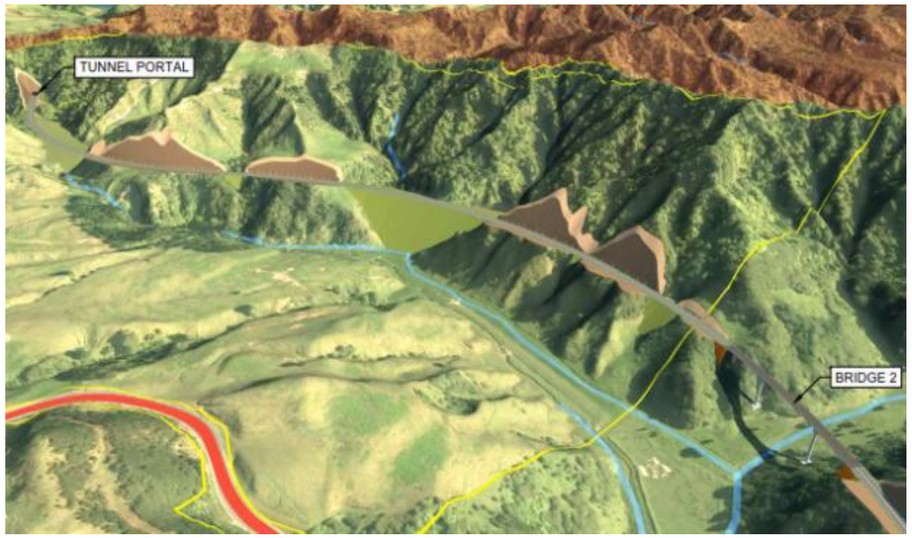
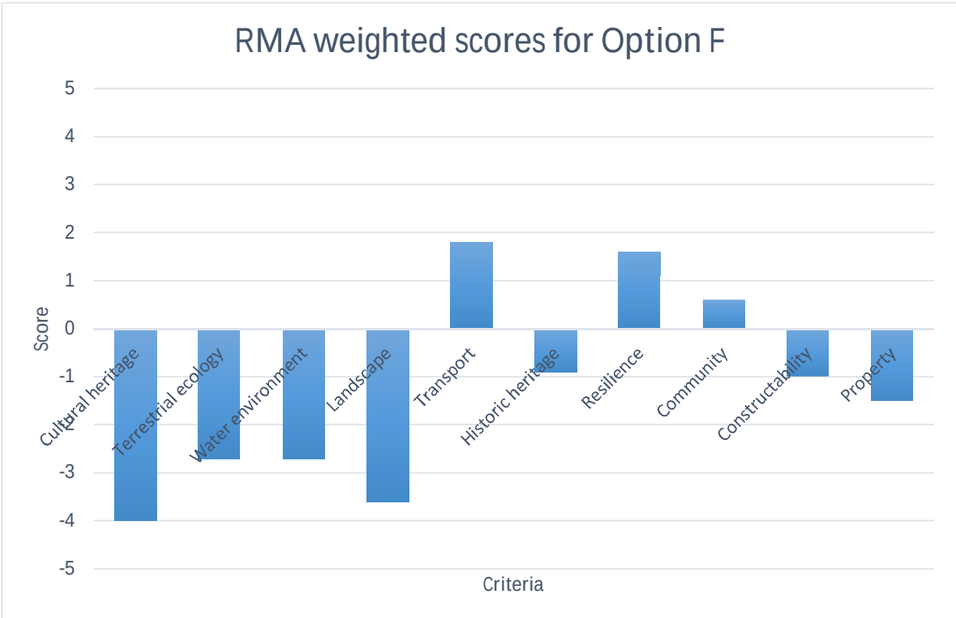


Figure 2: View to the south along Option F towards northern tunnel portal

Description and overall comments

- Relatively direct route involving a series of cuts rising from SH3 towards a short straight bridge over the Waipingau Valley
- Southern tunnel portal is located approximately 240 m west of the peak of Mt Messenger
- Follows a similar path to Option A north of tunnel, running along the western side of the valley, over two bridges before tying in to SH3
- Option F scored most the lowest for landscape and terrestrial ecology, given it disrupts key ridgelines (with ecological connectivity implications) and involves a large series of cuts which are incompatible with the surrounding landscape
- The corridor is also located relatively close to the summit of Mt Messenger, a waahi tapu, so lower cultural values scores
- Smaller bridge across Waipingao meant it scored slightly better than others from an erosion and sediment control perspective
- Improved resilience at northern end due to shifting of alignment out of the valley floor



Cultural heritage

Tunnel is relatively close to Mt Messenger peak, and effects on mana from the take of Treaty settlement land.

Terrestrial ecology

Lowest score – cuts through gully of high quality podocarps, and ecologically valuable forest west of Mt Messenger reduced scores.

Water environment

Effects on Waipingao catchment but a relatively short length of stream affected. Water management at southern end important.

Landscape

The lowest score for landscape, due to cuts and large fill towards the south.

Transport

Scored well on travel time, and relatively direct route so better for safety.

Historic heritage

Average score – no known sites in the proposed corridor.

Resilience

Scored relatively well, with the bridges replacing fill on liquefiable ground to the north, and lower fill embankments.

Community

Severance of walking track, and impact on Gordon dwelling.

Constructability

Highest score along with Option P, with some difficulties in series of cuts to the south, and borrow and disposal required to address cut/fill imbalance.

Property

Scored relatively poorly, Treaty settlement land at both ends as well as Anglesey and Washer compensation.

Option P

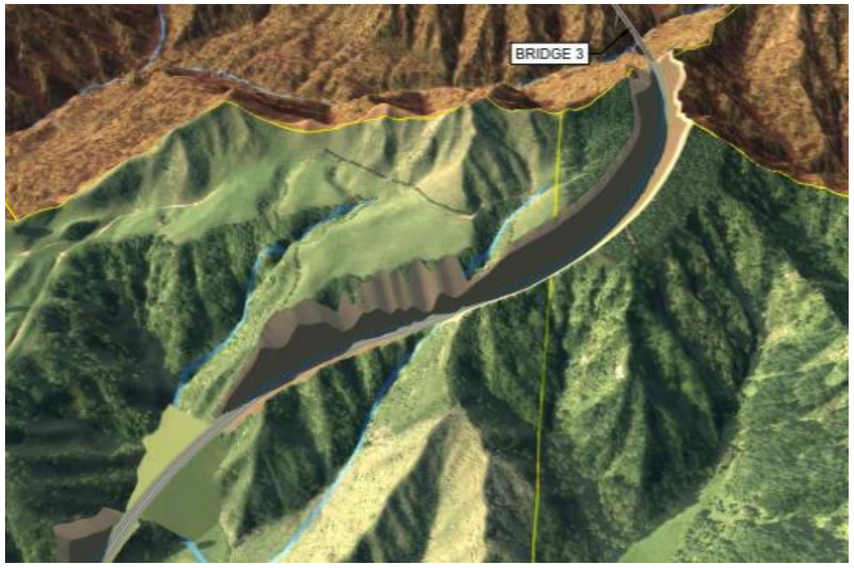
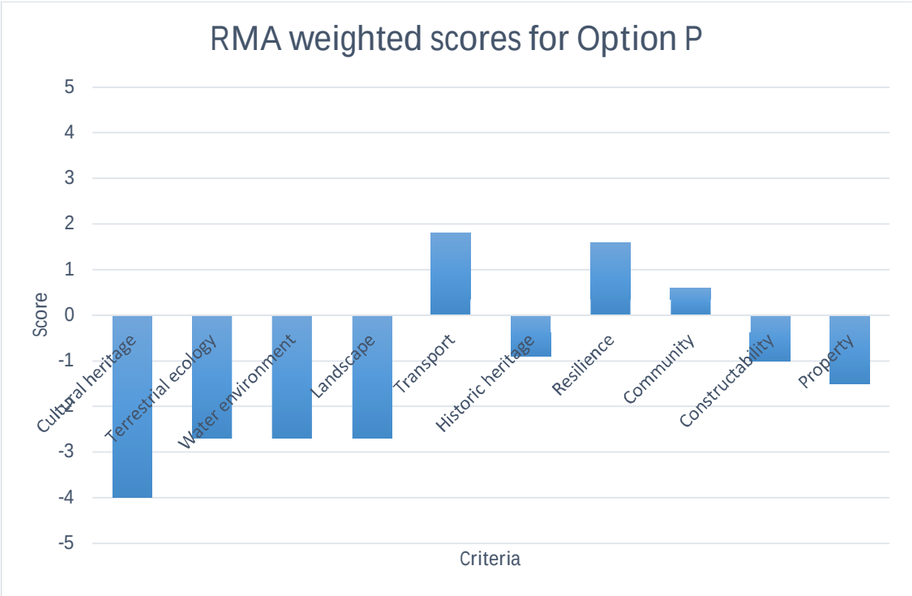


Figure 1: View towards the north along Option P

Figure 2: View across Option P towards the northern tie-in with SH3

Description

- Added to the shortlist following discussions with Ngati Tama, taking elements of previous options B, F and G
- Involves a long cut to the south of the Waipingao Valley, and a slightly longer bridge than F over the Valley towards the southern tunnel portal
- Southern tunnel portal is located approximately 480 m from the peak of Mt Messenger
- Option P scored relatively well for constructability, transport and resilience given its direct route and the removal of the northern end from the valley floor
- Could be difficult to do cut at the southern side of the tunnel – deep excavation with no access
- Ecological and landscape effects of the ridgeline cut south of Waipingao Valley and clearance of area of high value vegetation, although avoids most significant trees
- Higher slopes make erosion and sediment control challenging



Cultural heritage

Tunnel located farther from Mt Messenger peak, but still a considerable land take required.

Terrestrial ecology

Ranked averagely, with high value vegetation clearance proposed, and severance of a key ridgeline.

Water environment

Higher slope angles, such as through the cut south of the Waipingao Valley, mean erosion and sediment control is more difficult, particularly because of vegetation removal on the ridgeline.

Landscape

Scored relatively poorly due to large cut through southern ridgeline of the Waipingao Valley.

Transport

Direct route, with the passing lane a positive for travel time.

Historic heritage

Scored averagely – no registered archaeological sites along corridor.

Resilience

Also scored well for resilience, with less liquefiable road towards the northern end and a relatively short overall length.

Community

Scored averagely – lower on noise than other options.

Constructability

Highest score along with Option F, although difficult cut located south of the tunnel.

Property

Similar score to other options, with Ngāti Tama land take the key issue.

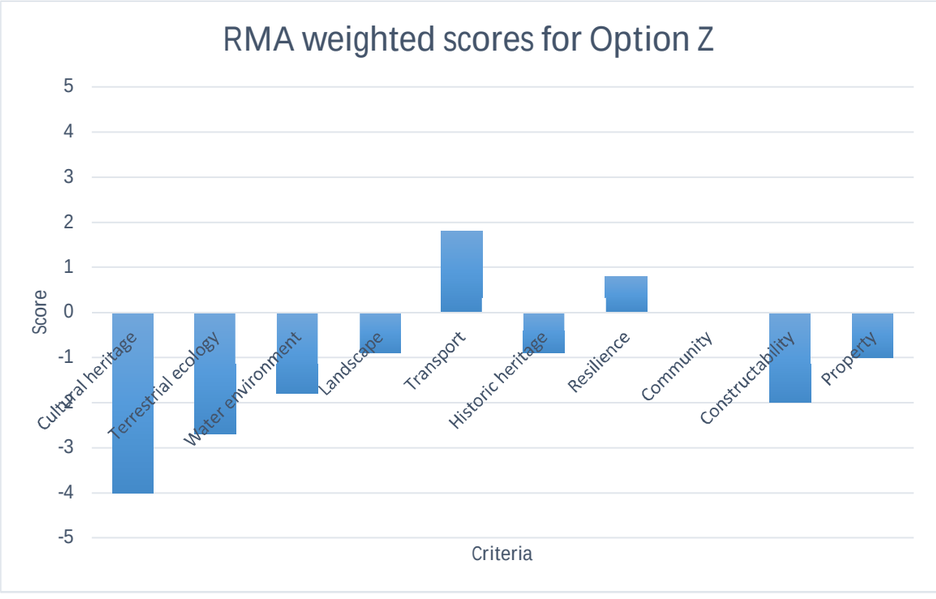
Option Z

Figure 1: View towards the north along Option Z

Figure 2: Northern section of Option Z, adjacent to existing SH3

Description

- The closest to the existing SH3 alignment, involving a number of complex interactions with the existing highway
- Now designed to be level with SH3 where it interacts, including at the northern and southern portals of the tunnel
- Northern end runs immediately east of a large landslide which would require lengthy and costly ground improvements
- Requires closure of SH3 for periods of the construction process
- Passes relatively close to the peak of Mt Messenger
- Difficulties around constructability given the interactions with the existing SH3 requiring likely road closures
- Scores well for landscape and water environment given the already modified nature of the SH3 corridor and surrounds
- Cultural values scored low due to proximity to Mt Messenger peak and loss of mana from Treaty settlement land take
- Ecology score impacted by the high value vegetation towards southern end of Option Z



Cultural heritage

Scored well for kokako and awa as away from Waipingao and release area, but cuts through very close to Mt Messenger peak.

Terrestrial ecology

The ecology has been modified around SH3, but an area of high value vegetation exists towards the southern end.

Water environment

The best score, based on already modified streams and no effects on catchments to the east and west.

Landscape

Scored well for landscape given the already modified landscape around SH3.

Transport

Scored well, but difficult to manage traffic due to SH3 interactions.

Historic heritage

Scored averagely – retains existing tunnel but not used for road purposes.

Resilience

Scored relatively well for resilience, with the high steep rock cuts and location at landslide headscarp being key issues.

Community

Lowest score, largely due to social impacts of closing SH3, such as freight, and hospital and emergency traffic.

Constructability

Scored poorly due to the complex interactions with the existing road, and the length ground improvement work required adjacent to the landslide.

Property

Now requires some Ngāti Tama land which brought score down since MCA1, but highest score among all options.