

Resilient access for the Marlborough Sounds

Transport Group Conference 2024



SONDS

OROUGH

ARLB

THE M

0 R

SS

ACCE

RESILIEN

2

Outline

- Context
- Hazard Assessment
- Programme Development
- Programme Assessment
- Preferred Programme
- Where to from here?

Context

Trigger:

- Four high intensity rain events in just over a year
- ~3,650 faults recorded across 500 km of road

Social:

- 2,100 usually resident
- Over 4,000 visitors/ day at peak
- Over 150 businesses

Transport:

- Roads closed for months
- Existing marine offering is limited/ geared towards visitors



Recovery Approach

Why a business case?

- Determine level of service for immediate recovery taking into account future adaptation
- Provide certainty about future access to the Marlborough Sounds
- Confirm approach for outstanding ~1,800 faults

Problems:

- **Disrupted Access:** The impacts of climate change are increasing the frequency and duration of disrupted access
- Lack of Alternatives: Reliance on roads for access to services and lack of alternatives has led to increased vulnerability to the community during road closures
- Asset Vulnerability: Poor construction standard and unstable geology means the Marlborough Sounds roads have a high maintenance cost and safety risk



S

D N D C

S

т сл

Natural Hazard Assessment

Seven assessments completed:

- Natural slope instability
- Human induced slope
 instability
- Liquefaction
- Flood inundation
- Coastal inundation and erosion
- Tsunami
- Debris flow



Programme Development: Road Responses

Road Segment Approach			Capital Works		
Approach	Vehicle Restrictions	Lane Width	Storm-water	Geotech	
Build back stronger	No additional restrictions	As existing	Whole route upgrades	Targeted: existing failures and improvements	
Build back stronger	Additional restrictions	More one lane sections	Whole route upgrades	Targeted: existing failures and improvements	
Targeted improvements	No additional restrictions	As existing	Targeted upgrades	Essential: address existing failures	
Targeted improvements	Additional restrictions	More one lane sections	Targeted upgrades	Essential: address existing failures	
Essential repairs	Additional restrictions	More one lane sections	Essential: address existing failures	Essential: address existing failures	
Marine Access	Additional restrictions	More one lane sections	Essential: address existing failures	None	



Programme Development: Marine Responses

Identified existing infrastructure

- Primary hubs
- Arterial hubs
- Local hubs

Recovery strategy

- Maintain and protect (BAU)
- Protect and upgrade
- Build new infrastructure



Te Aumiti/French Pass Example Programmes

Road Focus Marine Focus Balanced Build back stronger (No additional restrictions) Moki Bay Moki Bay Moki Bay Greville Greville **Build back stronger** Harbour Harbour (Additional restrictions) Rangitoto ki te Tonga Rangitoto ki te Tonga nga **Targeted improvements** d'Urville Island d'Urville Island (No additional restrictions) **Targeted improvements** (Additional restrictions) Te Aumiti/ Te Aumiti/ Te Aumiti/ French Pass French Pass rench Pass **Essential repairs** Port Ligar Port Ligar Port Ligar (Additional restrictions) Marine Access Bulwe (Additional restrictions) Waitata Bay Waitata Bay Waitata Bay Waiona Bay Vaiona Bay Naiona Bay Fitzeov Ba Nairang Okiwi Bay Okiwi Bay Okiwi Bay Duncan Bay Duncan Bay Duncan Bay **Marine Response** Maintain **Construct** new **Rai Valley** Rai Valle Rai Valley 2 per day Passenger: Passenger: 3 per week Havelock Haveloc

Freight

per week

Freight

1 per day

٩

8

* Initial BCR and cost estimate.

These were recalculated following confirmation of the Emerging Preferred Option

Assessment Method

	Consideration	Do Minimum	Road Focus	Road Access	Balanced	Marine Access	Marine Focus
Te Aumiti/ French Pass	Multi Criteria Analysis	-0.36	0.40	0.70	0.88	0.87	-0.16
	Benefit Cost Ratio*	0.30	0.57	0.76	0.83	0.61	0.49
	Wider Economic Impact	2.33	4.06	5.46	5.35	4.1	3.44
	Cost Estimate*	\$4.1M	\$75.4M	\$43.1M	\$27.0M	\$22.0M	\$20.2M
	Likelihood of restoring economic activity	Unlikely	Almost Certain	Almost Certain	Likely	Likely	Possible
	Decision			EPO		HAP	
Kenepuru	Multi Criteria Analysis	-0.52	-1.06	-0.67	0.07	-0.24	-0.38
	Benefit Cost Ratio*	0.57	0.86	1.07	1.12	0.59	0.53
	Wider Economic Impact	5.57	7.72	9.56	10.2	5.81	5.56
	Cost Estimate*	\$8.6M	\$145.2M	\$81.9M	\$57.6M	\$46.5M	\$41.6M
	Likelihood of restoring economic activity	Unlikely	Almost Certain	Likely	Likely	Possible	Possible
	Decision				EPO		HAP

ACCESS FO

SILIEN

ш М UNDS

ROUGH SO

0

ш

۲

∢

Σ

ш Т

 \vdash

К

Ο

ш

S S

ш

S

C

 \triangleleft

z

SILIE

ш

Ъ

Preferred Option



■ Somewhat unsupportive ■ Unsupportive



Hazard Adaptation Pathway



S

GH SOUND

Ο

പ്പ

0

RLB

₹

Т

Ο

S

C

A C

Z Ш

SILI

ш Ж

Where to now?

- NZTA Board accepted the business case in December 2023
- Estimated cost of preferred programme \$234M. Council share is \$128M
 - 100% of marine studies and improvements
 - 49% of road studies and improvements
 - 29% of road repairs
- Council are currently consulting on the Long Term Plan, which will inform the way that they will secure funds through rates
- Marine improvements will need a more detailed study to be completed to confirm best plan for the future.
- A funding application has been made to NZTA for the repair programme

	Marlborough District Council	Marlborough Roads	Waka Kotahi
	Engage with iwi partners individually and determine how they would like to be involved going forward	Review existing maintenance schedules and implement changes	
_	Engage with Heritage NZ		
Underway	Funding Plan: Aggressively pursue supplementary funding sources		
	Emergency Planning: Collaborate with the community to develop community response plans for future emergency events.		
Late 2023	Funding Plan: Include funding for projects in draft RLTP	Programme Management: Establish PMO to develop funding plan and procurement	Funding Plan: Board to endorse PBC and consider
S		Deliver priority road repairs at eight sites	FAR
Early 2024	Funding Plan: Consult through LTP to confirm rates funding		
Mid 2	Commence District Plan change to allow people to adapt more quickly to reduced road service through simpler/ easier process for constructing private marine infrastructure.	Develop and submit funding application for road repairs , including design philosophy based on the Preferred Programme Strategy, and confirmed Procurement Strategy.	
2024	Review District Plan provisions relating to the Sounds to determine appropriate protections, including managing overland flow paths that impact the road network.	Procure Marine Study and Resilience study to confirm the detail of the preferred option including feasibility, costs and priorities.	

Conclusions

- First time a business case has been completed to secure funding for local road repairs following storm damage.
- Set vision for how repairs and improvements will be approached, considering:
 - Corridor strategies vs solely site driven solutions
 - Scale of damage, and uncertainty of future levels of risk and costs
 - Various funding schemes
 - The need for community support
- Preferred programme estimate (\$234M) for improvements and repairs is just over half of the initial repair estimate of \$400M



Working together

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of place and of belonging. That's why at Stantec, we always design with community in mind.

We care about the communities we serve—because they're our communities too. We're designers, planners, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe. Stantec trades on the Toronto Stock Exchange (TSX) and the New York Stock Exchange (NYSE) under the symbol STN.

Australian offices:

Adelaide, Albany, Brisbane, Busselton, Gold Coast, Melbourne, Perth, Rockhampton, Sydney

New Zealand offices:

Alexandra, Auckland, Balclutha, Christchurch, Dunedin, Gisborne, Greymouth, Hamilton, Hastings, Napier, Nelson, Palmerston North, Queenstown, Tauranga, Wellington, Whangārei

Connect with us

0 f 🖸 🖬 🎔

Stantec.com

High and **Very High** Natural and Human Induced Slope Instability



UNDS

Ο

S

т С

C

S S

Natural Slope Instability



S

ш М

ЕSS

ပ ပ

∢

NNC

ທ T

₹

Human Induced Slope Instability



S S

Flood Inundation



Debris Flows



CESS

 \odot

Coastal Inundation and Erosion



S

Liquefaction



Е S S

URE ACC

⊃ ⊥

S

ΟNΟ

0

S H

OROUG

MARLB

Tsunami



4. Strategic Context



Max duration roads closed

French Pass:	64 days
Pelorus:	28 days
Queen Charlotte:	63 days
Kenepuru:	63 days
Port Underwood:	122 days

Problem 2: Lack of Alternatives

2,145 usually resident
 Up to ~4,000 visitors at peak
 At least 150 business

Loss of access to:



of Sounds roads have

no alternate route

Problem 3: Asset Vulnerability



To ads highly/very highly susceptible to slope instability following man-made adaptations

Slips accounted for 63% of total recorded faults





Rural roads in the Sounds spend 10 x more on emergency works than rest of Marlborough

Ο

S