COASTAL COMMUNITIES CYCLEWAY CONNECTION FEASIBILITY STUDY

PREPARED FOR THE DUNEDIN TRACKS NETWORK TRUST

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Abbreviations

2GP	Second Generation Plan
AADT	Average Annual Daily Traffic
A2O	Alps to Ocean Trail
CCCC	Coastal Communities Cycle Connection
DCC	Dunedin City Council
DIA	Department of Internal Affairs
DTNT	Dunedin Tracks Network Trust
DTTT	Dunedin Tunnels Trail Trust
DOC	Department of Conservation
LCSIA	Level Crossing Safety Impact Assessment
LINZ	Land Information New Zealand
MBIE	Ministry of Business, Innovation and Employment
NZCT	Ngā Haerenga The New Zealand Cycle Trail
NLTF	National Land Transport Fund
ORC	Otago Regional Council
PCL	Public Conservation Land
RLTP	Regional Land Transport Plan
RPO	Rail Protection Officer
RPTP	Regional Public Transport Plan
SH	State Highway
TL	True left
TR	True right
TTG	Taieri Trails Group
WK/NZTA	Waka Kotahi NZ Transport Agency

Executive Summary

Report Purpose

This report has been prepared to investigate options for building shared-use (walking and cycling) trails north of Dunedin. A successful funding application to the Lotteries Community Facilities Fund for the costs of preparing this technical feasibility study was made in December 2021. The Trust acknowledges the support of the Fund.

The project is to connect the communities of Waikouaiti-Karitāne and Warrington-Waitati using shared-use pathways, connecting these communities to the city, and potentially to Central and North Otago. The funding application's success was due to letters of support received from:

- Kāti Huirapa Runaka ki Puketeraki
- The Otago Regional Council
- The Department of Conservation
- The Waikouaiti Coast Community Board
- Many members of the public.

Common themes from residents' letters include a desire to access community facilities, such as the two Dunedin City Council community libraries and service centres, using a new option of walking or cycling.

A number of different routes were proposed. These were presented and discussed at two public workshops, and the feedback was used to guide further investigation work. A short list of feasible routes was prepared, taking into account factors such as land access, buildability, sustainability, and desirability.

The completed project will allow all members of the community to connect and to engage in social and recreational activities. It will build the resilience of the community and help to overcome barriers to accessing community facilities, especially where non-vehicle modes of transport are lacking.

Route Summary

Five sections of trail are described.

- Section 1: Waikouaiti to Karitāne.
- Section 2: Karitāne to Warrington
- Section 3: Warrington to Evansdale.
- Section 4: Evansdale to Waitati.
- Section 5: Waitati to Port Chalmers (which connects to Dunedin via the Harbour Cycleway).

Section One. Connecting Waikouaiti to Karitāne

From Waikouaiti the preferred route is to follow the sealed footpath west alongside SH1 then head south through town to the railway line. New trail would then follow the railway line heading south, crossing over the Waikouaiti River to Coast Rd. When the trail reaches Coast Rd, it would follow the true right of the Waikouaiti River, skirting around the north side of the town to Stornoway St. From here it would use existing footpaths through to the centre of Karitāne, finishing where Barvas St meets the foreshore. This would involve the construction of just under 4.2km of new trail, and three significant bridges (150m, 53m and 25m long), the longest of which would cost approximately $1M.

The trail would be 6.9km long, with 4.1km of new trail that could be built to a Grade2 (easy) standard and would cost approximately $4M ($4.5M allowing for 2 years cost escalation). There would be 264m of new bridges, which account for half of the budget.

Section Two. Connecting Karitāne to Warrington

A detailed investigation of this section has not been undertaken. A desktop analysis shows that there would be less climbing if a trail was built alongside the railway compared to a trail along the road reserve, so following the railway would likely be the preferred route. This would require easements over several properties to maintain a 5m setback from the centre of the railway line (affected landowners have not been contacted). It is currently 10.6km from Karitāne to Warrington via Coast Rd.

Section Three. Connecting Warrington to Evansdale

This would run from Warrington to the Arc Brewery at Evansdale, a distance of 3.2km. The preferred option is to run from the camping ground, up Hill Rd to Park Rd using existing footpaths. The trail would then head west beside Park Rd to Coast Rd, then along the seaward side of Coast Rd to Evansdale. 390m of new track would be constructed beside Park Rd, and 1.9km of existing footpath beside Coast Rd would be improved.

The upgraded trail would 3.2km long built to a Grade2 (easy) standard and cost approximately $330,000 ($370,000 allowing for escalation).

Section Four. Connecting Evansdale to Waitati

From Evansdale the trail would pass under the railway line then run south along the seaward side of the line either by constructing a rock bench alongside the railway formation or by building a boardwalk. This would keep riders away from the highway and the railway line and would provide the best riding experience. At the Waitati end, the trail would again pass under the railway line and loop back to town using existing footpaths. This section of the trail would require 2.4km of boardwalk or infill, and 2.1km of new trail.

The trail along the bay would be 5.1km long and could be built to a Grade1 or a Grade2 standard. It would cost between $9.7-14.3M depending on the construction method ($10.8-15.9M allowing escalation). Building a trail between SH1 and the railway line may be possible, but this wouldn't be a desirable route and it has additional construction risks. This would be shorter at 3.7km long and cheaper costing around $5.5M ($5.9M allowing for escalation).

Section Five. Connecting Waitati to Port Chalmers

From Waitati, the trail would zig-zag up the hill through private property and loop around the northern end of the Orokonui Ecosanctuary to Mopanui Rd. It would then head south to the Orokonui Ecosanctuary buildings mostly using the Orokonui perimeter fence track. From Orokonui it would traverse south below Blueskin Rd, cross Heyward Point Rd, then zig-zag down the hill to the railway line through a block of DCC leasehold land. It would then follow the railway corridor south to Port Chalmers, where it would join with the end of the Harbour Cycleway.

This section of the trail would be approximately 14km long and built to a Grade2 (Easy) standard. It would be an excellent riding experience, entirely off-road, away from busy roads and mostly through native bush. The estimated cost of the trail is $2.4 ($2.8M allowing for escalation).

If all these trails were to be constructed, there would be a 40km off-road trail all the way from Waikouaiti to Port Chalmers and Dunedin. This would be entirely within the boundary of Dunedin City, and easily rideable in a day.

Options for creating more adventurous riding routes between the Coastal Communities and Dunedin were also investigated. 4.5km of new track from Leith Saddle to Steep Hill Rd (Mountain Rd) would make two additional routes possible.

One would be from Waikouaiti via Mountain Rd and Steep Hill Rd. This is an old bullock track that initially connected Waikouaiti to Dunedin. A second route would be from Evansdale up Careys Creek using the existing track. Parts of the track would need to be upgraded, and approximately 1.6km of new track would be required at the top of the creek to link to Semple Rd. Either route could be combined with the coastal connection trail to create loop rides.

Recommendation

The #1 priority is to provide safe connections between Waikouaiti-Karitāne and Warrington-Waitati, as the only current option for riding/walking between these communities is via SH1. Ideally Section 1 and Section 4 would be constructed first, but the ability to build parts of these trails depend on several factors, some of which will have long lead times.

- Gaining KiwiRail agreement on the detailed design of the trail beside the railway will likely take 12-18 months.
- Gaining KiwiRail approval for the design of a clip-on bridge may take longer than this, as there will be designs and liability issues to resolve.
- Bridge and trail construction will require consents to be granted before they can proceed. This is likely to take 6-12 months.
- If funding to build the trail is to be sourced from central or local government (eg via the RLTP or Annual Plan process), this is likely to take 12-18 months.

The two most needed sections of the trail fall into the categories above.

- The Waikouaiti clip-on bridge will likely take the longest time to resolve, so work should be started as soon as possible. The remainder of the Waikouaiti trail and the smaller bridges will have less of an impact on the railway line, so are they are likely to take a shorter time to gain approval.
- A boardwalk between Evansdale and Waitati may gain KiwiRail approval sooner than a trail built against or alongside the railway formation as it would have less of an impact on the railway.

Initial construction should focus on quick wins to get the project off the ground. This includes:

- Trail that is not on KiwiRail land (eg trail beside Coast Rd at Karitāne and Warrington)
- The trail between Waitati and Orokonui could be developed reasonably easily. The trail between Orokonui and Port Chalmers relies on KiwiRail approval so will need to go through the KiwiRail approval process.

Report Owner

The report has been prepared for the Dunedin Tracks Network Trust (DnTNT), on behalf of the Coastal Communities Cycleway Connection group (CCCC), represented by Emily Cooper.

1. Overview

Over the last 2.5 years the Coastal Communities Cycleway Connection (CCCC) group has been investigating options for a multi-use trail linking Waikouaiti to Dunedin. This is coordinated by Emily Cooper and is supported by a Facebook group with 431 members.
https://www.facebook.com/groups/1889974474478613

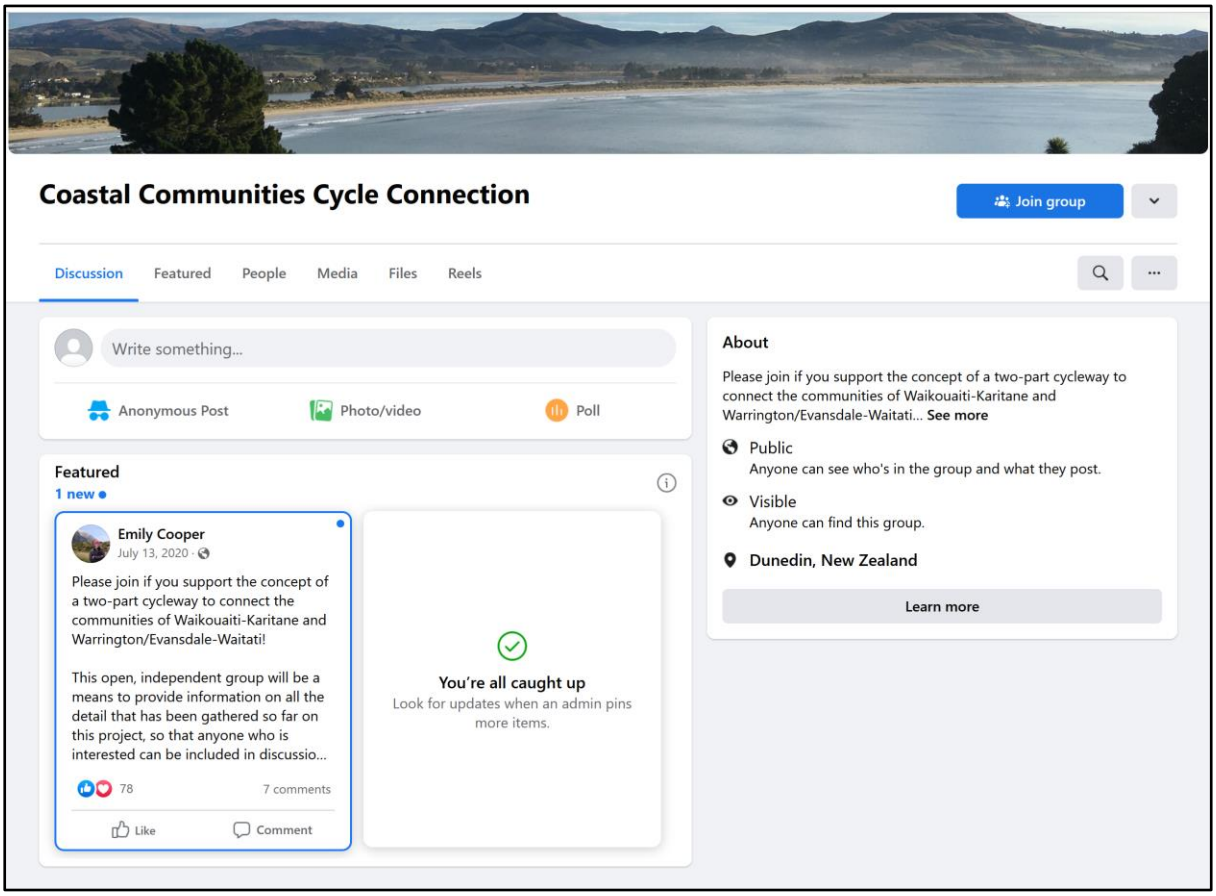


Figure 1. The Coastal Communities Cycle Connection Facebook page

While initially focussing on connecting the communities of Waikouaiti-Karitāne and Warrington-Waitati, the hope is that it will ultimately connect Dunedin to Oamaru, linking Dunedin to the Alps 2 Ocean cycle trail (part of the New Zealand Cycle Trail (ZNCT) network).

1.1 Background

Residents in the communities north of Dunedin are effectively cut off from the city and from each other unless they have a car. Visitors to Dunedin are also unable to access the north coast using alternative modes of transport such as riding on a safe cycling route, or often from using public transport. Up until recently there has been no weekend service for the 5640 residents on the north coast bus route [Census 2018]. Weekday evenings remain unserviced.

Compared to the extensive cycling, walking and bus options available to the 3579 residents of the Otago Peninsula, the coastal communities north of Dunedin are poorly connected and poorly served. Our project aims to address this imbalance, and the historic underinvestment in the north coast communities of Dunedin City.

The DCC has included our project as a key outtake from the activity management plans that they prepared to support funding requests included in the latest draft Regional Land Transport Plan (RLTP). This was part of their work to support alternative, safe transport options for our communities: *"To support active transport Dunedin City is investigating cycleway projects between Caversham and Mosgiel in the south and in the north servicing the communities of Warrington, Karitāne and Waikouati."*

This community project is also needed to support:

- The Government Policy Statement on land transport (GPS) (including safety, better travel options and emissions reductions)
- The Future Development Strategy (FDS) for Dunedin in partnership with mana whenua, supported by Waka Kotahi and Kāinga Ora. The FDS is a requirement of the Government's National Policy Statement on Urban Development (NPS-UD) and is jointly developed by the Dunedin City Council and Otago Regional Council. Focus areas include '**Supporting the resilience of outlying townships and settlements'.** The FDS will examine opportunities to increase the resilience of Dunedin's outlying townships and settlements to natural hazards and climate change and also consider how to best to support reductions in greenhouse gas emissions from vehicles through improved access to local services, employment and sustainable transportation options.'
- Waka Kotahi's Road to Zero (aims to have a 40% reduction in deaths and serious injuries from 2018 – 2030)
- The Ministry of Transport's Hikina te Kohupara Pathways to Net Zero by 2050 (proposals to reach zero emissions, including designing cities to better support public transport (including bikes and scooters))
- Economic development for the connected communities, especially once linkages exist (a Lincoln University Alps2Ocean (A2O) cycle trail visitor survey 2020 report found that the A2O was a strong attractant to cyclists, the large majority of whom (56%) would not have visited the districts in the absence of the trail. 58% were New Zealanders. The cyclists also made substantial expenditures associated with their ride. A2O annual associated spending is about $27.0m)

1.2 Project Brief

The CCCC Group was established in 2020 with the goal of building shared-use (walking and cycling) trails north of Dunedin.

- The priority is connections between Waikouaiti-Karitāne and Warrington-Waitati.
- Connecting the northern coastal communities to Dunedin is also desired.
- Connections between Dunedin and Oamaru will also be considered, as well as connections between Dunedin and Central Otago.
- The focus will primarily be on commuting trails, but consideration will be also given to incorporating recreational trails as part of the network.
- Gravel roads may also form part of network given the popularity of gravel riding.

The technical feasibility study will inform the project plan, timeline and budget, which will be required for the next step: securing infrastructure funding. The feasibility study will identify potential routes for the trails and determine the most appropriate route based on useability, cost, environmental impact, and community feedback.

1.3 Project Scope

The CCCC Group engaged Active Systems Ltd to conduct a technical study evaluating various route options.

The feasibility study shall investigate options for constructing shared-use paths that link Waikouaiti-Karitāne and Warrington-Waitati. In addition to connecting these communities, the potential for tracks linking south to Dunedin, inland to Central Otago and northward to Oamaru should also be considered.

The proposed tracks should be suitable for cyclists, runners and walkers. They should ideally conform to the NZCT Grade2 (Easy) trail standards, otherwise the Grade3 (Intermediate) trail standards. Public land should be used where possible, and failing that, options for easements over private land should be identified.

Stakeholder consultation may be required with the Dunedin City Council, the Otago Regional Council, local community boards, Runaka, Waka Kotahi, Department of Conservation and LINZ. Where appropriate, consultation with private landowners will be undertaken.

The most appropriate routes should be identified based on useability, cost, environmental impact, and stakeholder feedback. Plans shall be prepared showing the routes and budget estimates produced to determine likely construction costs.

Note: This is not a business case, so discussion of economic benefits of proposed trails are outside the scope of the report.

2. Connecting Communities

The CCCC Group's primary goal is to create links between the local communities and to provide a recreational resource for people that live along the coast north of Dunedin.

- Waikouaiti and Karitāne are only 4km apart but there is no safe way to walk or ride between the two communities. This makes it difficult for many people to share local services.
- The people in Blueskin Bay also share many services, but there is no safe way to walk or ride between Waitati, Evansdale / Warrington.

Options for building off-road trails between these towns are discussed, together with options for linking to Dunedin.

2.1 Northern Coastal Communities

According to the 2018 census data, the population of the northern coastal communities is 5640, and these regions are steadily growing. If a trail was ultimately to connect these communities to Port Chalmers, 7,548 people would reside close to the trail.

Community	2018 Census	2013	Increase
Waikouaiti	1194	1122	6%
Bucklands Crossing (includes Warrington, Omimi, Karitāne)	1482	1425	4%
Mt Cargill (includes Waitati, Purakaunui, Aramoana)	2016	1776	14%
Sawyers Bay	1449	1317	10%
Port Chalmers	1407	1419	-1%
TOTAL	**7,548**		

Table 1. Coastal community populations [2018 Census data]

A core aim of the project is to enable people in currently poorly connected (and sometimes poorly served) communities to be able to better share services. These include:

2.1.1 Waikouaiti

Waikouaiti has the largest concentration of residents between Dunedin and Oamaru. It has shops, a café, bakery, hotel, museum, the East Otago Events Centre, DCC library and service centre, camping ground, school, several businesses, and public toilets.

2.1.2 Hawksbury Village

Hawksbury Village is 1km northwest of Karitāne and has a community pool.

2.1.3 Karitāne

Karitāne has a general store, school (with a sealed pump track), Puketeraki Marae and Runaka facilities, and public toilets.

2.1.4 Warrington

Warrington has a freedom camping area (toilet and water supply), school and community hall.

2.1.5 Evansdale

Evansdale has the Arc Brewing which offers food and refreshments.

2.1.6 Waitati

Waitati / Doctors Point has a convenience store, café, a school, DCC library and service centre, community hall, and public toilets. Orokonui Ecosanctuary sits between Waitati and Port Chalmers and has a café.

2.1.7 Sawyers Bay / Port Chalmers

A trail from the northern coastal communities would likely terminate in Port Chalmers. Port Chalmers has accommodation, a supermarket, cafés, shops, hotels, a school, several businesses, and public toilets.

The Harbour Cycleway will soon connect Port Chalmers to central Dunedin. It is a grade 1 (Easiest) trail, sealed and suitable for cyclists of all abilities. The shared path forms part of the Otago Harbour Cycleway, a 40km loop around the harbour to Harrington Point. Port Chalmers is also connected to Portobello by a ferry service.

Figure 2. Northern Coastal Communities

2.2 Initial Community Consultation

The first community meetings to gauge interest in the development of shared-use trails were held in September 2020 (prior to applying for funding for this study). The following question was posed:

"Would you like to be able to cycle safely between Waikouaiti and Karitāne and between Warrington and Waitati along a dedicated cycleway? There is a project to get this happening and your support can help make it happen!"

There were 33 attendees in Waikouaiti and 46 attendees in Waitati, together with a great deal of enthusiasm and support. Soon after this, the Coastal Communities Cycleway Connection (CCCC) group was formed. The community Facebook group now has 431 members.

Figure 3. Potential links between Waikouaiti, Karitāne, Warrington, Waitati, and Dunedin

3 Existing On-road Routes

There is no recommended riding route between Waikouaiti and Karitāne. Several secondary roads (Ramrock Rd, McGrath Rd) can be used to avoid part of the highway, but this route is significantly longer. There is no safe route for walking or commuting.

The DCC recommended cycling route between Karitāne and Dunedin is to use Coast Rd to Evansdale, then use State Highway 1 to Waitati. This section of the highway is 3.4km long and has an Average Annual Daily Traffic (AADT) count of 7170, with 11.3% heavy vehicles [WK/NZTA]. This is not a pleasant place to walk or to ride a bike, and it is not a safe place to ride for novice riders or children. The lack of a safe riding or walking route effectively cuts the Blueskin Bay community in half.

The solution to these issues is to develop a series of off-road (separated) trails that can be safely used by riders and walkers, of all ages and abilities.

There are three different options for people riding between Waitati and Dunedin.

3.1 Mt Cargill Rd

The DCC recommended cycling route uses sealed roads. From Waitati, riders go up Harvey St and onto Mt Cargill Rd. This is a narrow and winding road with an AADT of 575. After climbing to a high point of 382m, riders descend on north Rd to North East Valley, finishing at the Dunedin Botanic Gardens.

3.2 Blueskin Rd

An alternative sealed-road route from Waitati to Dunedin is via Blueskin Rd. This has an AADT of 1179, so compared to the Mt Cargill route it has more than twice as much traffic. It is 5.4km longer, but it requires 50m less climbing. Once the Port Chalmers shared path is complete, this route may see more use, as many riders will currently be deterred by the busy road between Dunedin and Port Chalmers (SH88 has an AADT of 4803).

3.3 Leith Valley Rd

A third route is via Waitati Valley Rd and Leith Valley Rd, which pass over Leith Saddle at an elevation of 365m. This is the same saddle that the Northern Motorway uses. These are mostly gravel roads. Going this way is 0.9km longer than the Mt Cargill route.

Route	Road surface	Highest point	AADT	Distance
Mt Cargill Rd (recommended)	Sealed	382m	572	
Blueskin Rd	Sealed	332m	1179	5.4km longer
Leith Valley	Gravel	265m	147	0.9km longer

Table 2. On-road options over the north Dunedin hills [DCC Transportation Department]

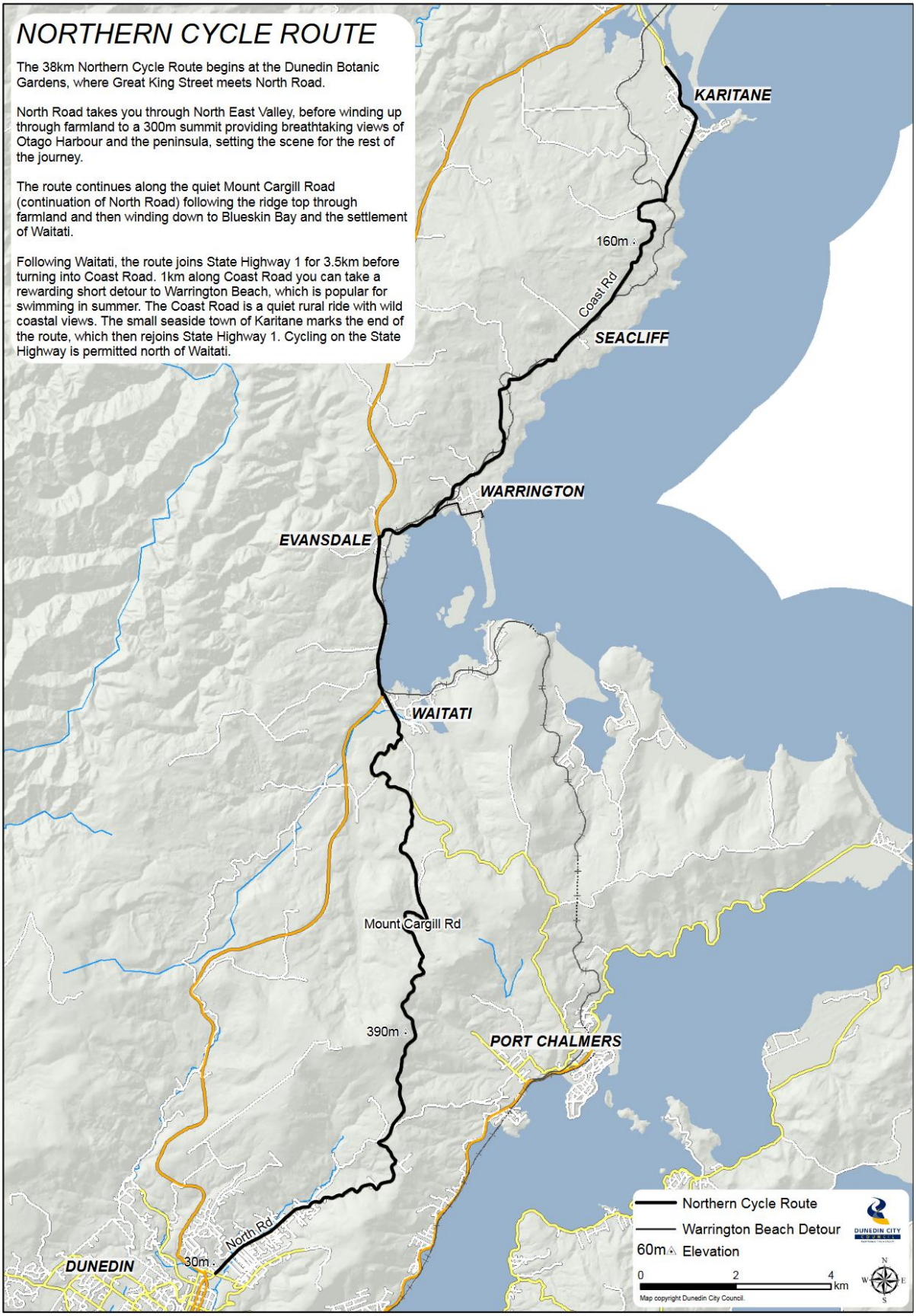


Figure 4. DCC Northern Cycle Route [DCC website]

5. Land Access

Off-road trails can be constructed on private land or public land. Public land is more desirable as easements are required for trails over private land. There are several different types of public land on which a shared use trail might be constructed. This includes:

- Dunedin City Council property (yellow areas).
- Public Conservation Land (green areas). Administered by the Department of Conservation.
- Road reserve (red lines). Formed and unformed roads, administered by WK/NZTA and DCC.
- Crown land (pink areas). Administered by Land Information NZ.
- Hydro parcels (dark blue areas). Administered by Land Information NZ.
- Railway land (light blue areas). Administered by KiwiRail.

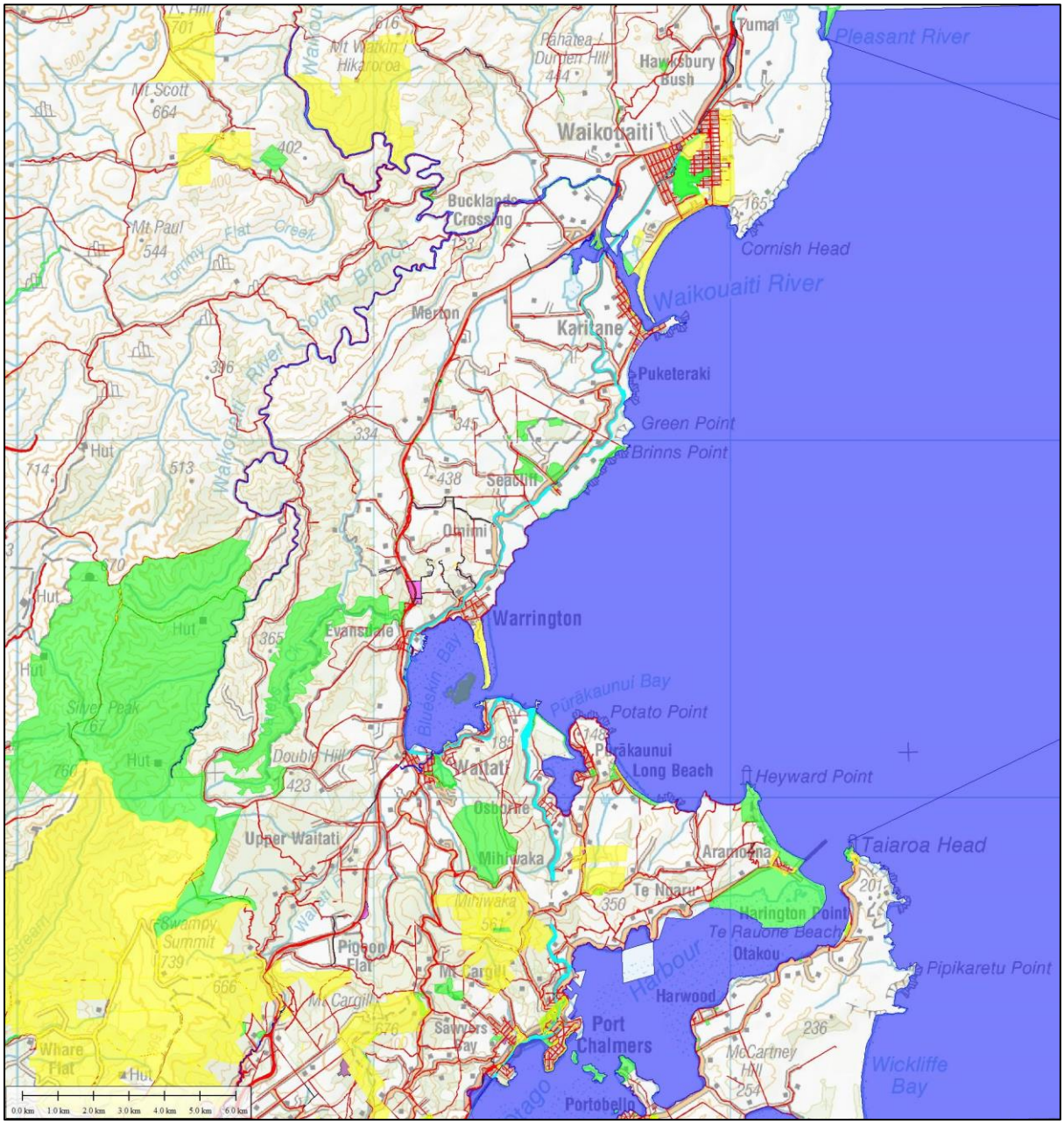


Figure 5. Public land parcels.

5.2 Road reserve

Road reserve often provides the best opportunities for trail linkages, but space may be limited due to roads not being aligned to legal boundaries, and there are fences, drainage ditches, power poles, culverts, buried cables, driveways and other infrastructure to contend with. These add to the construction cost and complexity.

Where roads traverse steep slopes, it is often difficult to build trails within the road reserve. Trails below the road will tend to undercut the road, and trails above the road may undercut the land above. Retaining walls can be used to stabilise the land, but these add significant cost.

Roads also often have relatively long bridges over water courses, so a trail beside a road may require lengthy clip-on or free-standing bridges. Building cycle trails beside busy roads such as state highways is often the least desired option due to the traffic noise.

Local roads are administered by the DCC. State Highways are administered by Waka Kotahi / NZTA.

5.2 Railway corridor

Railway corridors often provide a continuous route through private land, but building beside the railway has similar issues to building beside roads, with the added complications of needing to meet KiwiRail design and construction specifications. This includes maintaining a standoff distance of at least 5m between the centre of rail and the trail, and fencing between the trail and the railway when there isn't a natural barrier to restrict access onto the railway. Some areas of the rail corridor are leased to private individuals, but the terms of the leases usually allow KiwiRail renegotiate them.

The Main South Line (MSL) runs from Dunedin to Port Chalmers, then north through Waikouaiti. There are several tunnels on this route, through which public access is not permitted.

5.3 Use of Dunedin City Council property

The DCC manage a considerable amount of property north of Dunedin. This consists of Public Reserves, Water Department property, leased properties, and land used for forestry (owned by City Forests). These areas can be used for track construction, provided approval is gained from the relevant department. Access through leased land will depend on the terms of the lease.

5.4 Use of Department of Conservation property

Tracks can generally be developed on Public Conservation Land (PCL), provided that the activity is approved and permitted under the Conservation Management Strategy (CMS). Gaining approval may depend on the designation of the land, as well as the purpose of the track. Walking is permitted on most PCL, so the construction of walking tracks is often approved, provided the land values are not negatively impacted. As far as the Conservation Act is concerned, bicycles are classed as vehicles, and the use of public vehicles is not permitted on PCL unless the track or the area where they are to be used is expressly listed in the CMS. If not listed, then the construction of bike-specific trails cannot be considered.

The Otago CMS has recently undergone a partial review to add additional tracks and areas to the approved access table, so the construction of bike tracks on most PCL in Otago can now be considered. For further information refer to the Otago CMS 2016 – Partial Review 2022, Section 3.

5.4 Use of Crown Land

Crown Land is similar to PCL, but it is administered by Land Information NZ (LINZ) or the council.

5.5 Use of Hydro Parcels

Hydro Parcels are areas around water bodies. This includes riverbeds and coastlines. These are administered by Land Information NZ (LINZ). It is usually straight forward to get permission to use hydro areas. Consent is likely to be required from the regional council.

6 NZ Track Standards

Mountain Bike tracks in NZ are graded on a scale of 1-6, with increasing difficulty. These have been developed and endorsed by Mountain Bike NZ, Department of Conservation, Walking Access NZ, NZ Mountain Safety Council, and a number of other stakeholders.

Figure 6. NZ MTB track grading scale [Mountain Bike NZ]

Generally, as the grade of a trail increases:

- The steepness of the trail increases.
- The speed of riders increases.
- The length of trail required to get up or down a hill decreases.
- The cost of the trail decreases.
- The width of the trail decreases.
- The skill level required to use the trail increases.
- The size of the potential userbase decreases.

There are 3 design guides for trails in NZ that sit with 3 different organisations. There is a good level of consistency running through the 3 documents, so a trail built or audited using one of the standards will fit equally well with the other standards.

6.1 NZCT Design Guide

The New Zealand Cycle Trail (NZCT) Design Guide (5th Edition) has been produced by MBIE to support the construction of cycle trails around NZ. It contains a design specification for off-road trails. This is generally used when building trails that form part of the NZCT network, or trails that are part of a commuting network. This is the standard that will be referenced in this report.

Grade	Grade Description
1.  	**Description**: Flat, wide, smooth, trail. Trail feels safe to ride. Ideal as a first ride for non-cyclists, and those wanting an easy gradient or experience. Trail allows for cyclists to ride two abreast most of the time, and provides a social component to the ride. Cyclists will be able to ride the total distance of the trail without dismounting for obstacles. **Gradient**: 0-2 degrees for at least 98% of trail; between 2 and 3 degrees for no more than 100 metres at a time, and between 3 and 4 degrees for no more than 10 m at a time. If the track is designed and promoted to be ridden predominantly in one direction, then the downhills can be steeper (up to 4 degrees for up to 100 m). Sealed trails can be steeper (same as the equivalent Grade of on-road trail; see Table 13). **Width**: 'Double trail' preferred = 2.5 m to 4 m for 90% of trail, where cyclists may ride side by side. 'Single trail' width of 1.5 m, with 1.2 m minimum. Horizontal clearances as in Section 3.4. **Radius of turn**: 6 m minimum to outside of turn. **Surface**: Compacted/stabilised base course, under a top course aggregate of maximum AP20 mm. The surface shall be smooth and even, and easy to ride in all weather conditions. **Watercourses**: All water courses bridged **Bridge Width:** Recommended bridge width of at least 1.5 m, absolute minimum width of 1.2 m with handrail/barrier to fall. The approach should be the same width as the structure for 10 metres. **Obstacles**: None. No stiles. Cattle stops should preferably be at least 1.5 m wide, and minimum 1.2 m wide. **Length**: 3.5-4.5 hours/day (30-50 km/day). **Barriers/Guard rails**: Areas such as bluffs or bridges where a fall would result in death or serious harm require hand-rails.

Figure 7. NZCT Design Specification for Grade1 trails [NZCT Design Guide 2019]

Grade	Grade Description
2.  	**Description**: Some gentle climbs, smooth trail. Suitable for confident beginner riders, the trail is predictable with no surprises. Social component with riders able to ride side by side at times, but possibly large sections of single trail. **Gradient**: 0-3.5 degrees for at least 95% of trail; between 3.5 and 5 degrees for no more than 100 metres at a time, and between 5 and 6 degrees for no more than 10 m at a time. If the track is designed and promoted to be ridden predominantly in one direction, then the downhills can be steeper (up to 8 degrees). Sealed trails can be steeper (same as the equivalent Grade of on-road trail; see Table 13). **Width**: Between 0.9 m and 1.5 m for single trail and minimum 2.2 m for double trail sections with adequate clearances. Horizontal clearances as in Section 3.4. **Radius of turn**: 4 m minimum with at least 5 m desirable to outside of turn. **Surface**: Compacted/stabilised base course, under a maximum top course aggregate of maximum AP30 mm. The surface should be smooth and easy to ride in all weather conditions. **Watercourses**: Watercourses bridged, except for fords with less than 100 mm of water in normal flow, which can be easily ridden. Surface should be as smooth as adjacent trail. **Bridge Width:** Recommended bridge width at least 1.5 m, minimum width of 1.0 m with handrail/barrier to fall. The approach should be the same width as the structure for 10 metres. **Obstacles**: Some rocks/roots/ruts that can either be avoided, or are less than 50 mm high. No stiles. Cattle stops should be minimum 1.2 m wide. **Length**: 4-5 hours/day (30-50 km/day). **Barriers/Guard rails**: Areas such as bluffs or bridges where a fall would result in death or serious harm require hand-rails.
3.  	**Description:** Narrow trail, there will be some hills to climb, obstacles may be encountered on the trail, and there may be exposure on the edge of the trail. **Gradient:** 0-5 degrees for at least 90% of trail; between 5 and 7 degrees for no more than 100 metres at a time, and a maximum of 10 degrees for no more than 10 m at a time. If the track is designed and promoted to be ridden predominantly in one direction, then the downhills can be steeper (up to 11 degrees). Sealed trails can be steeper (same as the equivalent Grade of on-road trail; see Table 13). **Width:** 0.9 m for 90% of the trail, 0.6 m minimum with adequate clearances. Horizontal clearances as in Section 3.4. **Radius of turn:** 2.5 m minimum, with at least 4 m desirable to outside of turn. **Surface:** Generally firm, but may have some short muddy or loose sections. **Watercourses:** Watercourses bridged, except for fords with less than 200 mm of water in normal flow, which can be easily ridden. **Bridge Width:** Recommended at least 1.0 m; minimum 0.75 m deck if the width at handlebar height is 1.2 m. If there are no handrails, then minimum width of 1 m for structures less than 0.5m high. **Obstacles:** Occasional rocks/roots and ruts may be up to 100 mm high/deep and may be unavoidable. **Length:** 4-6 hours/day (30-50 km/day for an intermediate cyclist). **Barriers/Guard rails:** Areas such as bluffs or bridges where a fall would result in death require hand-rails. Areas where a fall would likely result in serious harm require either hand-rails or sight rails or a warning sign, depending on the nature of the drop off and likelihood of a fall.

Figure 8. NZCT Design Specification for Grade2-3 trails [NZCT Design Guide 2019]

Grade	Grade Description
4.  	**Description:** Steep climbs, with unavoidable obstacles on a narrow trail, and there will be poor traction in places. Possibly some walking sections. **Gradient:** 0-7 degrees for at least 90% of trail; between 7 and 9 degrees for no more than 100 metres at a time, and maximum 12 degrees for up to 10 m at a time. If the track is designed and promoted to be ridden predominantly in one direction, then the downhills can be steeper (up to 15 degrees). Sealed trails can be steeper (same as the equivalent Grade of on-road trail; see Table 13). **Width:** 0.6 m minimum on steep terrain with drop-offs, 0.3 m minimum on flat ground. Horizontal clearances as in Section 3.4. **Radius of turn:** 2 m minimum, with 3 m desirable to outside of turn. **Surface:** Firm and loose. **Watercourses:** Watercourses bridged, except for fords with less than 300 mm of water in normal flow, which can be easily ridden. **Bridge Width:** Recommended 1.0 m; minimum 0.6 m. **Obstacles:** Many rocks/roots and ruts up to 200 mm high/deep. Also some purpose-built obstacles to liven things up, such as drop-offs and jumps. **Length:** 4-8 hours/day for advanced cyclists. **Barriers/Guard rails:** Areas such as bluffs or bridges where a fall would result in death require hand-rails. Areas where a fall would likely result in serious harm require either hand-rails or sight rails or a warning sign, depending on the nature of the drop off and likelihood of a fall.

Figure 9. NZCT Design Specification for Grade4 trails [NZCT Design Guide 2019]

For trails that are used by both walkers and cyclists, there is a relationship of NZCT off-road trail grades to HB8630 track classes and visitor groups. This is described in Table 16 in the Design Guide.

NZCT Grade	Equivalent HB 8630 User Group and Track Classification	HB 8630 Visitor Group	Reasoning / comments
1.  	2. Short walk	SST	Easiest non-urban category in HB 8630. All watercourses bridged. NZCT route distances will be longer than those suggested in HB 8630.
2.  	3. Walking track	DV	Similar experience level. Similar steps between adjacent categories.
3.  	4. Great walk/ easy tramping track	BCC	Similar experience level. Moderate exertion levels Similar steps between adjacent categories.
4.  	5. Tramping track	BCA	Similar experience level. Considerable exertion levels HB 8630 specifies some tramping tracks may be unformed – unlikely for NZCT trails.
5.  			
6.  	6. Route	RS	HB 8630 specifies routes as unformed – may be appropriate for extreme NZCT trails.

Figure 10. Relationship between NZCT trail grades and Doc user groups [NZCT Design Guide]

6.2 Recreation Aotearoa Mountain Bike Trail Design and Construction Guidelines

The Recreation Aotearoa standard has additional detail when it comes to downhill-specific trails and more advanced trails (eg berm angles).

6.3 Department of Conservation Cycle Trail Service Standards

This is a standards document for new and existing off-road cycle tracks on land managed by the Department of Conservation. These should be referenced when trails are built on Public Conservation Land (PCL).

6.4 HB8630

New Zealand Handbook – Tracks and Outdoor Visitor Structures (SNZ HB 8630:2004) is produced by Standards NZ and provides specifications for those responsible for designing, constructing, maintaining, and/or managing tracks and outdoor visitor structures. This has useful guidelines around the use of barriers.

6.5 Examples of Graded Tracks

Listed below are examples of tracks around Otago with differing grades.

- Grade 1 (easiest) trails are flat and wide and wide. The Otago Central Rail Trail is a good example of a Grade 1 gravel trail. The Harbour Cycle trail is also classed as a Grade 1 trail. Grade 1 commuting trails will be useable by all cyclists.
- Grade 2 (Easy) trails are a little steeper and narrower. The Big Easy on Signal Hill is an example of a Grade 2 trail. Most novice mountain bikers can ride up or down it.
- Grade 3 (Intermediate) trails are steeper and narrower again. The Easy Down is an example of a Grade 3 trail. With the increasing use of e-bikes, Grade 3 trails are now useable by most cyclists as well, as the motor compensates for the increased steepness. This means that less-skilled riders are now able to access Intermediate graded tracks, so additional care may need to be taken to make the trail as predictable and as safe as possible (eg making the track wider, sightlines better, or corners wider).
- The Grade 4 (Advanced) category generally applies to mountain biking trails rather than commuting tracks. Technically, a steep gravel path or road may be considered to be Grade 4 because of its gradient (as it is difficult to ride in the uphill direction), but it may still be rideable by a novice in the downhill direction. At times, increased width can compensate for increased steepness. An example of this is the 4WD track at Signal Hill, easily rideable by most people in the downhill direction, but an Advanced ride in the uphill direction (but not as Advanced if riding an e-bike).
- 5 and 6 (Expert and Extreme) trails are mountain-bike specific trails, not generally used for commuting.

6.6 Dual direction tracks

Many early mountain bike tracks were built for 2-way use, as funds were limited and there were relatively few people using the tracks. As user numbers have increased, so has the likelihood for user conflict. Most intensively used trail networks (ie bike parks) are moving away from 2-way trails and building single direction trails. This means building dedicated climbing tracks and dedicated descending tracks. The Big Easy on Signal Hill is a good example of this evolution. It was built as a 2-way trail and worked well for a number of years, but as user numbers have increased, a separate descending trail was required to reduce the number of people riding down the Big Easy.

For longer trails such as commuting trails, it may not be practical (financially or physically) to build separate uphill and downhill tracks. This means that users will be riding in both directions. To minimise conflict and to make the trail as safe as possible, it is better to build commuting trails at an easier grade, as this will:

- Minimise the steepness of the trail.
- Reduce the speed of riders.
- Reduce the likelihood of conflict or accidents.

This also aligns with the goal of making the trail useable by as many people as possible. Less steep trails are also more sustainable, as there is less wear and tear on the trail surface, and less water damage.

Recommendation:

Construct Grade 1 (Easiest) or Grade2 (Easy) trails where possible. If not, then Grade 3 (Intermediate) trails will still be useable by a large proportion of users (some with the assistance of e-bikes).

6.6 Assessment and Design Process

The gradient of a trail or a road is a key determinant of the trail grading. Provided that accurate terrain data is available, it is possible to analyse the gradient of existing roads to see how they fit within the grading standard. The same applies to assessing potential construction corridors. If a trail is to be build alongside a road within the road reserve, analysing the terrain will show what gradient of trail might be able to be constructed. Once this is determined, other factors such as trail width, corner diameter etc can be designed to fit the standard.

Early this year an updated Digital Elevation Model (DEM) was released for the Otago region. This was produced by a LiDAR survey (Light Detection and Ranging). LiDAR effectively sees through vegetation and provides an accurate representation of the terrain. The recent survey had a pulse density of at least 4 pulses/square meter, a typical vertical accuracy of <10cm, and a horizontal accuracy <31cm. This is sufficient to allow desktop route assessment and design.

To determine the NZCT grade of an existing road or evaluate a construction corridor, long sections were created along the trail alignment, and the gradient along the section was analysed. Each trail grading has a defined maximum average gradient that 90% of the trail must sit within. The specification allows sections of the trail to be slightly steeper provided the sections aren't longer than 100m, and a third band of even steeper trail is permitted provided it isn't longer than 10m.

This analysis is likely to be conservative, as there may be small variances in the drawn alignment that result in steeper sectional slopes. Also, when a new trail is constructed, it is often possible to cut and fill areas along the alignment to smooth out the gradient of the trail.

6.6.1 Fieldwork

A significant amount of fieldwork has been undertaken. This included:

- Physically inspecting existing tracks and roads, and noting factors such as trail width, fall hazards, surface condition.
- Walking proposed routes where space might be at a premium (eg along road reserves or beside railway lines)
- Assessing experience-influencing factors such as views from the route, the proximity to traffic, the nature of the environment that the trail would pass through.
- Talking to landowners.
- Looking at fencing requirements through farmland.
- Reviewing areas where the trail might share roads or cross over roads.
- Sourcing traffic volumes from the DCC and WK/NZTA

7. Route Investigations

The route between Waikouaiti and Dunedin and can be broken into 5 sections.

- Waikouaiti to Karitāne.
- Karitāne to Warrington.
- Warrington to Evansdale
- Evansdale to Waitati.
- Waitati to Dunedin.

As part of the study, existing roads have been surveyed as they may form part of the trail network (on-road routes). The image below shows the tracks, roads and routes assessed, with recommended routes in green.

Figure 11. Potential off-road routes. Preferred routes are shown in green, investigated routes in yellow. Solid lines show potential off-road trail. Dashed lines show roads or potential trail corridors beside roads.

7.1 Waikouaiti to Karitāne

Waikouaiti and Karitāne are two close communities separated by a stretch of water with no safe and easy walking or riding route between them. As the crow flies, Karitāne is just 4km from Waikouaiti. To ride between the two communities, you need to either ride along SH1 or ride along at least part of the highway, use Ramrock and McGrath roads, then cross back over the highway. This is a 10km trip and the last link to Karitāne is along a narrow section of Coast Rd with no road shoulder.

There are 4 ways that Waikouaiti could be better connected to Karitāne.

Figure 12. Route options between Waikouaiti and Karitāne.

7.1.1 Along the coast

From Waikouaiti if you follow the beach south for 3km you will come to the mouth of the Waikouaiti River. From here it is only 230m to Karitāne. Technically it would be possible to span this with a suspension bridge, but it would be more than 50% longer than any pedestrian bridge built in NZ. The Heaphy bridge was 147m long before it was destroyed in a flood. Replacing it with a 200m bridge was deemed uneconomic, so it is instead being replaced with two separate 100m bridges. Pedestrian bridges up to 721m long have been constructed overseas, but these are swing bridges (which dip down), not suspension bridges. Suspension bridges with intermediate piers could be an option, but the dynamic nature of the river mouth would likely pose too much risk. There would also be significant consenting issues to overcome, so bridging the mouth of the bay would not be practical.

Providing a ferry service as part of a community-lead initiative was discussed with a group of residents. This would be relatively cheap to implement, but there would be several drawbacks compared to constructing a physical trail.

- It would not be practical to run a ferry service all of the time, so relying on a ferry service, use of the trail would be limited.
- There is a risk that a community-run venture might not be enduring. This could then put the operation of the trail at risk. If the service was not commercially viable, then the service would need to be subsidised.
- There would be compliance and qualification requirements both for operators and equipment that may make it difficult to use volunteers or locals.
- A ferry service may be weather affected.

7.1.2 Along secondary roads

From Waikouaiti you can ride west on SH1 to Ramrock Rd the follow it around the foot of the hills to McGrath Rd. This brings you back to the coast, crossing over the Waikouaiti river and then past Hawksbury Village. After passing the village it's 700m back up the highway to Coast Rd, then Coast Rd leads to Karitāne.

This route could be made safer by building sections of trail to take riders off the highway, but most of the route would remain on-road, so it would be doing little to connect the communities. Trail users would still need to cross the highway twice.

7.1.3 Alongside the Highway

Building a trail along either side of the highway would require easements over private property due to limited road reserve. To eliminate the highway crossings, the trail would need to run along the eastern side of the highway, and extensive earthworks would be required to make space for a trail below a large bluff. A 90m bridge would be required over the Waikouaiti River, and further south the river is hard up against the road formation for 700m, so there is no space upon which to build a trail.

7.1.4 Recommended Route: Alongside the Railway

The preferred option is to build a trail from Waikouaiti to Karitāne alongside the railway line. This is the most direct route between the communities, and at just over 5km it would be an easy ride, also appealing to walkers and runners. In would be the best user experience as it would be entirely off-road and away from the highway. The large bridges would likely make it an attraction in its own right.

From Waikouaiti trail users would head west along the footpath on the south side of the highway. This would take them past the shops, public toilets, library, pub and museum. They would continue along the footpath to Beach St, then head south going up and over the hill. Towards the bottom of

Beach St they would cross the railway line and turn west into Scotia St. A new path would start at the corner in the road and run alongside the railway line. A Level Crossing Safety Impact Assessment (LCSIA) would need to be undertaken to determine if the rail crossing needs to be upgraded.

After crossing Henry St, the preferred option is for the trail to run beside the railway line within the row of Oak trees. KiwiRail require a fence to be installed between trail and the railway line that keeps people at least 5m from the centreline of the railway. KiwiRail also need a corridor at least 3m wide to enable maintenance vehicles to access the rail line and the bridges. There are 3 options which will depend on the outcome of the KiwiRail design review process.

- If KiwiRail allow a fence to be installed 5m from rail CL, the trail would sit outside the fence and maintenance vehicles would share the trail with riders.
- If this is not acceptable then the fence would need to be moved a meter or two further from the railway to provide a 3m corridor inside the fence for the maintenance vehicles.
- If there is not sufficient space to build the trail within the trees, Mainland Poultry may be prepared to offer access over a strip of their land along the southern side of the trees on which a trail could be built.

The trail would then ramp down from the edge of the river terrace to the Waikouaiti river flats. The railway from here sits on a 2m high embankment that has been formed by sourcing material from beside the rail alignment. This has created a 7m wide ditch along both sides of the railway line. The ditch extends to within a meter of the KiwiRail boundary, so if access over the adjacent private property cannot be obtained, parts of the ditch would need to be filled in to provide an area for the trail.

There are three bridges along this section of the railway. The first two rail bridges are 25m and 53m long, and the watercourses could be spanned using conventional suspension bridges. The third rail bridge is 150m long, and spanning the main watercourse with a suspension bridge would require the longest suspension bridge in NZ. While doable, this would be challenging, in part due to the length of the bridge and in part due to the limited site access. The old bridge over the Heaphy River was the longest suspension bridge in NZ at 149m long which is a comparable distance, but if the abutments needed to be further apart than the rail abutments, the suspension bridge design (particularly the wind loads and stay wire positioning) become more difficult. eg a 200m bridge to replace the flood damaged Heaphy bridge was investigated but it was found to be more cost effective to instead build two separate 100m suspension bridges.

Fortunately, the rail bridge is currently being replaced, and it should be possible to add a clip-on pedestrian bridge to the new bridge. This would cost approximately $1M, assuming that the clip-on bridge works could be incorporated into the KiwiRail bridge replacement works to share causeway and staging costs. This is likely to be challenging as the KiwiRail design approval process typically takes at least 12 months, and it may take longer than this to reach a legal agreement with KiwiRail about securing a pedestrian bridge to their asset. The replacement of a short section of the KiwiRail bridge is slated to start soon, with the remainder of the bridge to follow at a later date. There is also the potential to reuse the hardfill that KiwiRail has brought onto site to form parts of the cycle trail.

The figure below shows a concept design for a clip-on bridge. KiwiRail rules require the edge of the bridge to be at least 5m from rail centreline. This means that the bridge would be mounted on a relatively long cantilever. Modelling would be required to ensure that the KiwiRail bridge piers could withstand the additional load, and this may dictate the width and weight of the cycleway bridge (eg GRP grid may be required for the bridge decking instead of timber to save weight, but this increases

cost). If the offset load was too high, an additional pile could be required to support the clip-on bridge. It may be possible to obtain a departure from the KiwiRail rules and locate the bridge closer to the railway (as has been done for parts of the Port Chalmers cycleway) to reduce the offset load, but this is considered to be unlikely. From a user perspective, a clip-on bridge would be preferrable to a suspension bridge as it wouldn't sway, and it would not be limited to carrying a set number of people.

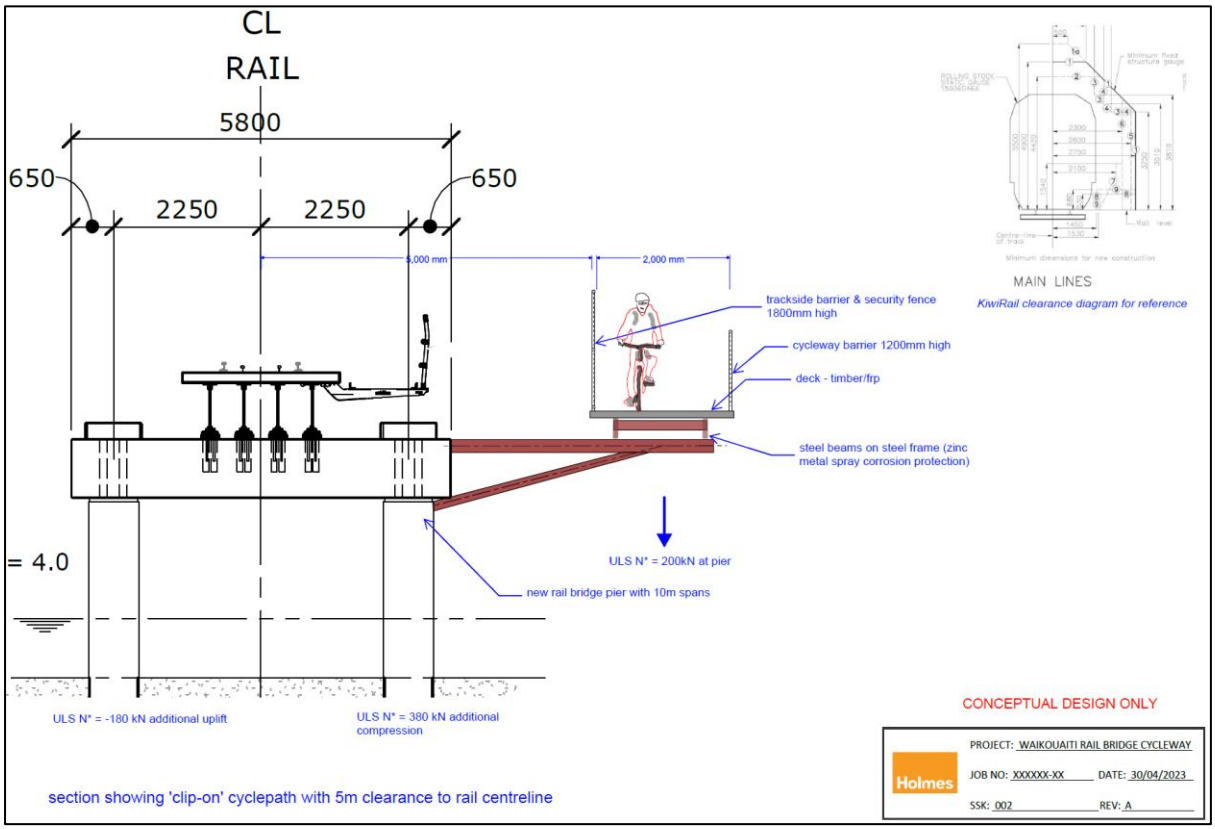


Figure 13 Concept design for clip on bridge [Holmes Consulting]

When the trail reaches Coast Rd, it would follow the true right of the Waikouaiti River. The first 700m would be beside the road where additional infilling or boardwalks would be required as there is no road shoulder. Upon reaching town, the trail would veer away from Coast Rd and continue alongside the river, climbing through DCC property and passing the end of Dunnet St. Where necessary the trail could be built below the edge of the terrace to keep it out of sight. It would then drop back down to river level and finish across from Eris St. From here it would cross Coast Rd and use existing footpaths beside Stornoway St, Scarp St Grimness St and Barvas St, finishing at the foreshore.

KiwiRail has provided "approval in principle" for the rail corridor between Beach St and Coast Rd (330.4 to 333.1 MSL) to be used for a shared use path. This is included in Appendix 1.

Recommendation:

Build an off-road trail from Waikouaiti to Karitāne following the railway line, then from Coast Rd run along the true right of the Waikouaiti River.

Distance	6.9km (4.1km of new trail, 264m of new bridges)
Climbing	30m
Grade	Grade2 (easy)
Estimated cost	$4M ($4.5M allowing for 2 years cost escalation)

7.2 Karitāne to Warrington

There are several options for building an off-road trail between Karitāne and Warrington.

- Beside Coast Rd
- Beside the Railway
- Through private property

Due to the terrain and limited space beside both the road and the railway, easements would be required over private property if an off-road trail is to be constructed. Affected landowners have not yet been contacted, so detailed options are not included in this report.

The elevation profile of the road and the railway are shown below, starting at Puketeraki and heading south. If a trail was to be constructed, there would be significantly less climbing if the trail ran beside the railway (the blue line).

It is likely that a trail downhill from the railway line would be preferred as this would have less impact on the rail side drainage given that there are land stability issues along much of the coast. For part of the way there is a KiwiRail access track below the railway line. This may be able to be shared if a fence could be installed between the track and the railway line 5m from the rail centreline. An application will need to be made to KiwiRail for approval in principle to use the rail corridor.

It is 10.6km from Karitāne to Warrington via Coast Rd.

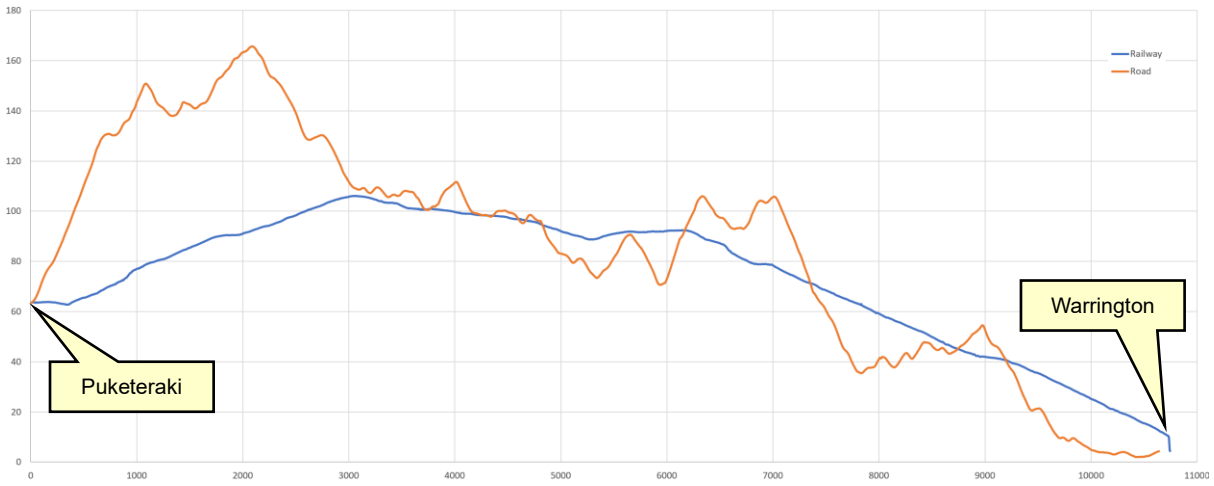


Figure 14. Elevation profile of the road and railway between Puketeraki and Warrington

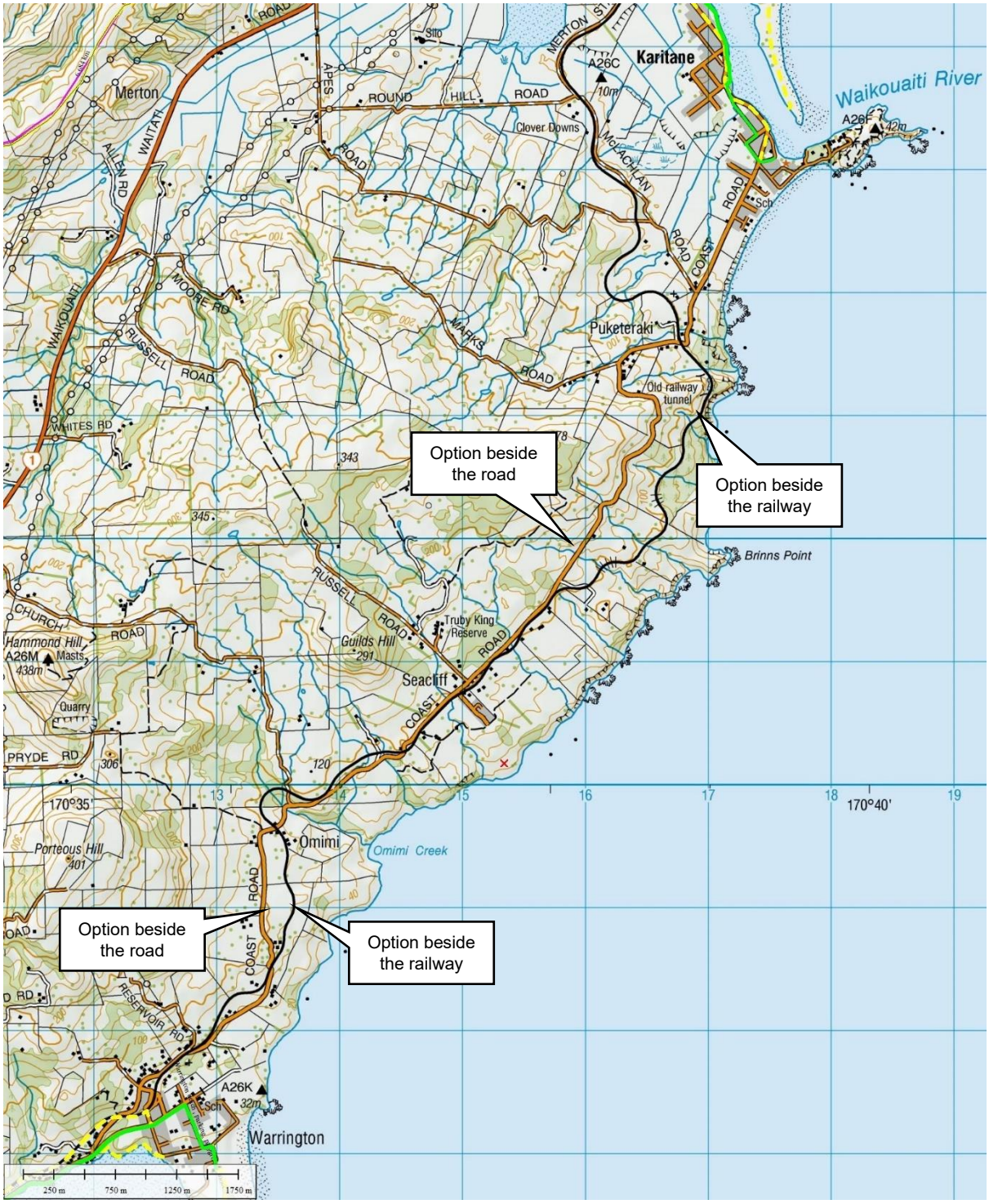


Figure 15. Public access corridors between Karitāne and Warrington

7.3 Warrington to Evansdale

It's just over 2km from Warrington to Evansdale via Coast Rd. Four route options were considered. These are shown in the map below.

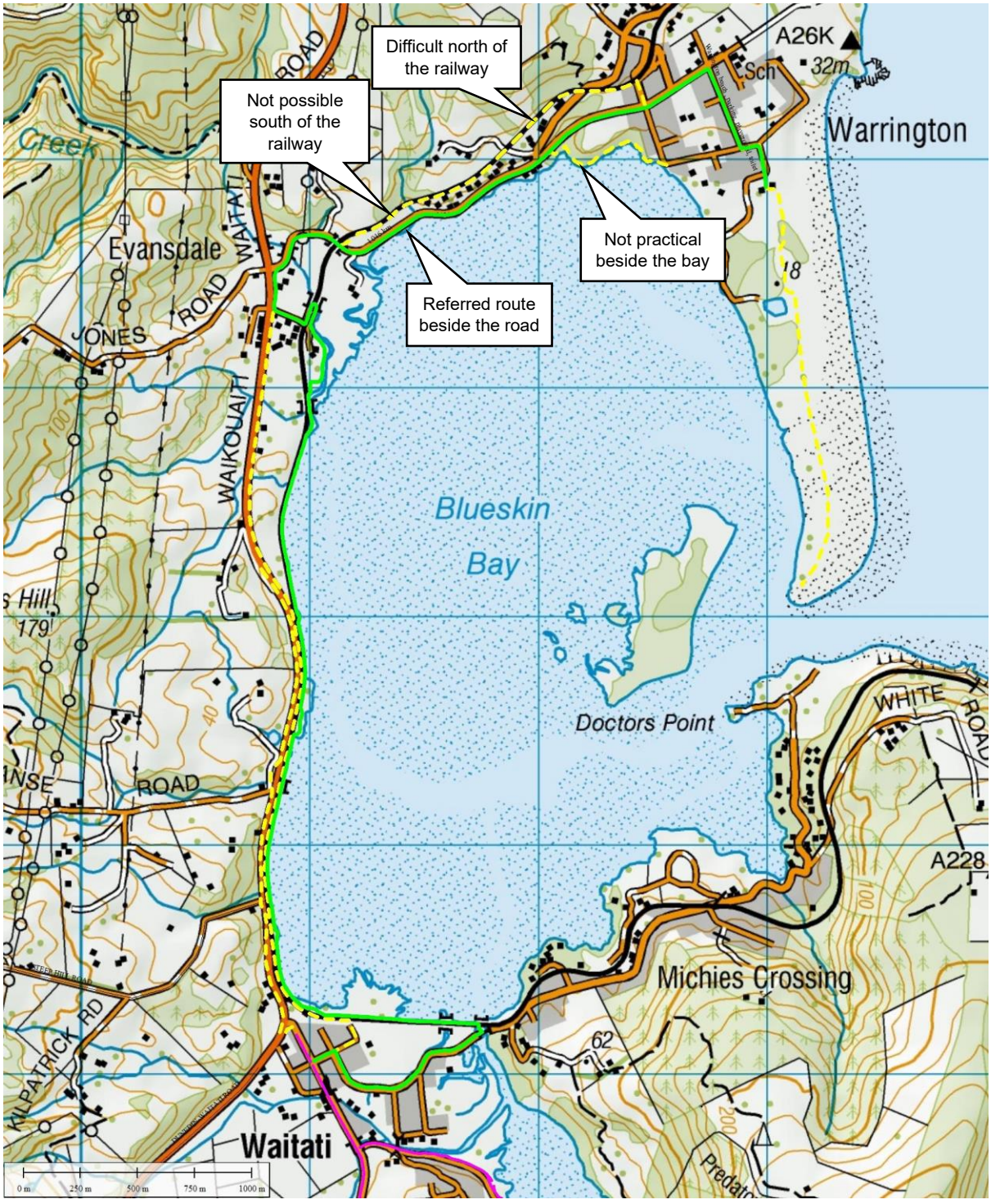


Figure 16. Route options between Warrington and Evansdale

7.3.1 North of the Railway

The railway runs above Coast Rd. For most of the way there is a 10-20m wide strip of railway reserve west of the railway line, but halfway along it narrows to within 5m from rail CL. An easement over 2 properties would be required to construct a trail along this side of the railway line. There are several cuttings above the railway up to 7m high. These would need to be widened to make room for the trail. Some of these cuttings have had stability issues, so KiwiRail would likely have geotechnical concerns. There are also several railway embankments that would need to be widened. Construction of a trail along the west side of the railway would be possible, but difficult.

7.3.2 South of the Railway

It will not be practical to build trail along the eastern side of the railway. There are several large railway embankments that would need to be widened which is not practical, with railway cuttings either side which make building a graded trail difficult. There is also an existing lease over part of the railway reserve, and the trail would run close to several houses.

7.3.3 New Trail Alongside the Bay

There is a strip of public land along the coast from Bay Rd to Park Rd. It would be technically possible to build an off-road trail, but it would be challenging and expensive to construct as a Grade 2 or Grade 3 track because of the steep terrain and the narrow construction corridor. It would also require an easement through private property.

7.3.4 Recommended Route: Alongside Park Rd and Coast Rd

There is an existing gravel path along the southern side of Park Rd. This runs through the middle of Warrington and is linked to the beach and public toilets via Hill Rd. Riders would use the existing gravel path beside Park Rd and head west crossing Bank St. After 100m the path switches to the north side of the street, then back to the south side of the road after 390m. It would be safer to keep cyclists and walkers on the south side of the road and minimise the number of road crossings. 390m of new trail would be required to do this. This would ensure that riders stay out of the intersection with Coast Rd.

There is a 1.5-2m wide shoulder along the south side of Coast Rd. The road shoulder is sufficiently wide to ride or walk on, but people riding along it against the flow of traffic (ie to the north) will likely feel uncomfortable as they're almost riding on the wrong side of the road. It would be better to separate the shared path from the road by installing a strip of curb stops, plastic edge markers or a post and rope barrier between the trail and the road. These will however have the effect of narrowing the space available and making it more difficult to pass other users. Where necessary, the edge of the road formation could be widened using a small retaining wall to provide additional width for the trail. This may introduce a fall hazard and make it necessary to install a barrier (which may be prudent regardless). There are several power poles on the seaward side of the road that sit in the middle of the road shoulder, so structures may be required to enable people to safely ride around them.

From the railway overbridge the trail would continue along the seaward side of Coast Rd. The road shoulder is mostly 2m wide, but it could benefit from surface improvements in places. The road bridge over Careys Creek is 40m long, and there is a 1300mm wide pedestrian corridor along the downstream side. This is reasonably narrow for bikes, but the sight lines are good, and people can walk their bike if they need to. It may be possible to angle the handrails out a little further to provide additional shy space. After crossing the bridge, a short section of trail around the Arc Brewery car park would bring people to Evansdale.

Recommendation:

Use the existing path beside Park Rd and build 390m of trail along the south side of the road so users don't need to cross, then recross the road. Install a row of curb stops to separate the trail from Coast Rd. Widen the road shoulder where necessary and assess the fall hazard to determine where barriers might be required.

Distance	3.2km. 390m of new trail. 1.9km of existing gravel path upgraded.
Climbing	40m
Grade	Grade2 (Easy)
Estimated cost	$330,000 ($370,000 allowing for 2 years cost escalation)

From the railway overbridge on Coast Rd, there is a second way to connect to Evansdale.

7.3.5 Beside the Railway

If the trail from Evansdale to Waitati is built on the seaward side of the railway, 280m of additional trail could link it to the trail along Coast Rd. This would be the most direct route and would provide more trail that is away from the roads, but it would be significantly more expensive compared to the route following Coast Rd as it would require a new 40m bridge over Careys Creek and a 10m bridge over the drain beside Coast Rd. A disadvantage of this route is that not all riders would go through Evansdale and past the brewery.

7.4 Evansdale to Waitati

Currently the only option for people walking or riding between Evansdale and Waitati is to use the State Highway. This has an average daily traffic counts of 7170 vehicles, with 11.3% of them being heavy vehicles [WK/NZTA], so not many people walk or ride. Those that that live in Waitati, Evansdale and Warrington form part of the Blueskin Bay community, sharing services such as schools, shops and the DCC's Blueskin Bay library. In many ways the community is severed by the lack of a safe connecting road or path.

The options for connecting the Blueskin Bay communities is limited by the geography. SH1 and the railway line sit between Blueskin Bay and foothills, taking up most of the useable space. The route options shown below were considered.

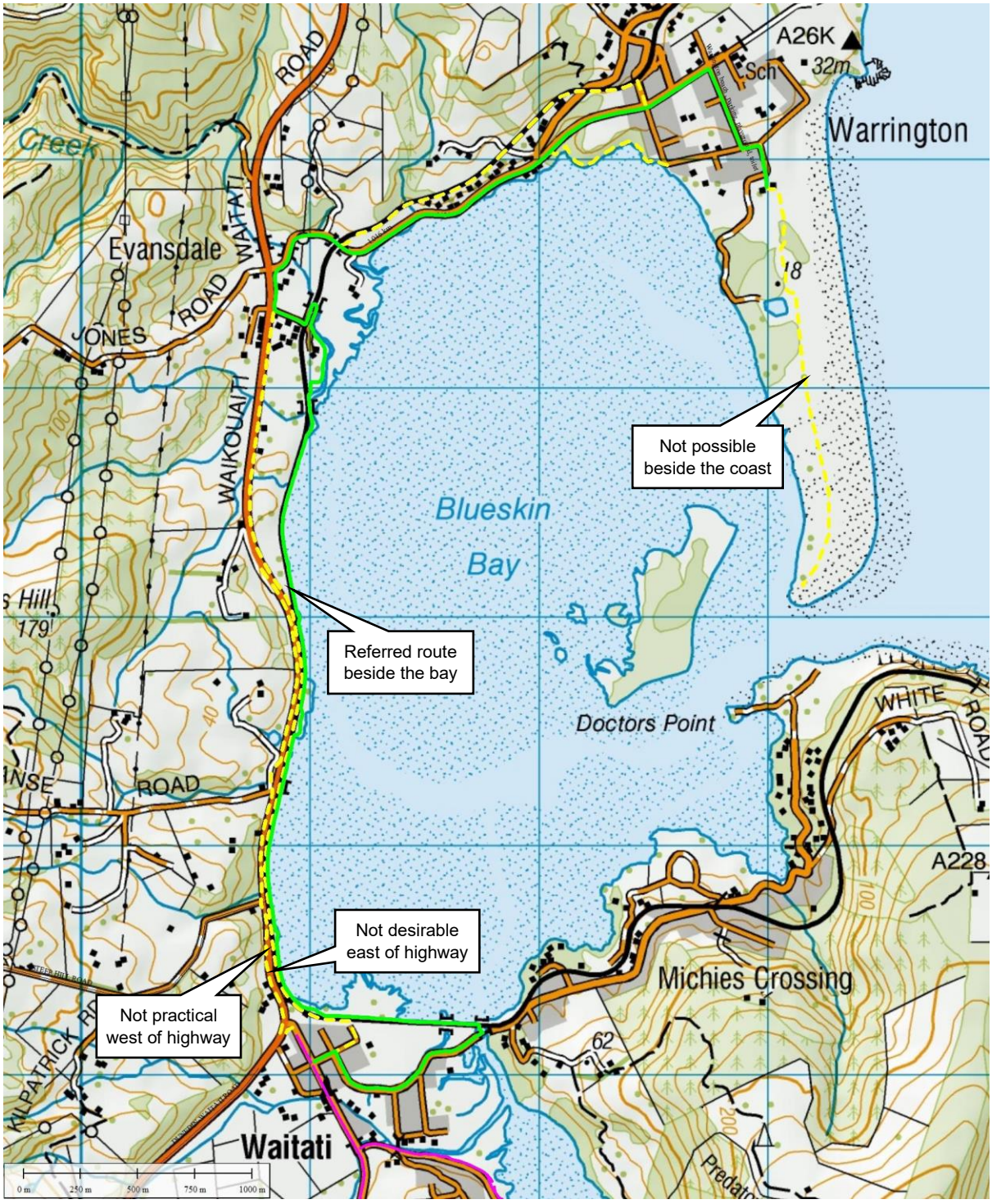


Figure 17. Route options between Evansdale and Waitati

7.4.1 Trail Along the Coast

Doctors Point sits just south of Blueskin Bay and Warrington sits to the north. The bay is just under 4km long. From Warrington a spit extends most of the way to Doctors Point, leaving a gap that is currently 320m wide. This is too far to economically span with a suspension bridge. Pedestrian bridges up to 721m long have been constructed overseas, but these are swing bridges (which dip down), not suspension bridges.

The active river channel is around half this distance at 150m wide. Suspension bridges of this length have been built in NZ (eg the 147m Heaphy bridge), so a multi-span bridge, or a bridge and boardwalk combination could in theory be constructed, but dynamic nature of the area would likely pose too much risk. There would also be significant consenting issues to overcome.

Conclusion:

Bridging the mouth of the Blueskin Bay would not be practical.

7.4.2 Trail West of SH1

The state highway runs along the foot of the hills north of Waitati. The road reserve typically extends 10m from the edge line. 3-4m of this space is occupied by the road shoulder, leaving only 5m in places within which to build a trail. Riding or walking along a track so close to such a busy highway would be a poor user experience.

For much of the way there are cuttings beside the road, some up to 20m high. To form a reasonably flat trail, a significant amount of material would need to be removed, in places cutting into adjoining properties. Making significant cuts above the highway may raise geotechnical issues, and there are also several houses close to the highway that may be affected. Building the trail further from the highway so it could traverse over the cuttings instead of through them would require access through 6 or 7 different properties.

An additional drawback of building a trail along the west side of the highway is that trail users would need to cross the highway twice. At the Evansdale end the road crossing would be at the bottom of the downhill run into town and close to the intersection with Coast Rd. At Waitati people would be crossing at a sweeping bend that is also close to an intersection. The speed limit at these locations is 100km/h, so walking or riding across the highway would not be safe and is not compatible with an easy graded trail.

If a trail could be built along the western side of the road, it may be possible to build a bridge over the highway. A bridge would need to span at least 20m across the road and have ramps approaching 50m long so that they're rideable. Each bridge would cost in the region of $600k-$1M.

Installing an underpass instead of a bridge would be challenging. At the Harvey St intersection the road is only 5m above sea level, so the bottom of the underpass would be close to sea level (although a pumped drainage system could be installed). An underpass would likely cost more than a bridge over the highway.

Conclusion:

Building a trail along the west side of the highway would be expensive and challenging, and it would be a poor user experience.

7.4.3 Trail Between SH1 and the Railway

From Evansdale the trail could head south beside either the railway or follow the highway.

7.4.3.1 Following the railway

The rail side route would make for a nicer riding environment, but it has several challenges. From the Arc Brewery users would access the trail via King St. Along the western side of the railway there is 400m of rail cuttings that would need to be widened by at least 3m to accommodate the trail. 250m of railway causeway would also need be widened. There is creek that is spanned by an 18m rail bridge, so this would require a bridge, mounted sufficiently high to not pose a threat to the KiwiRail bridge given that it would be on the upstream side of the rail bridge. Just north of the bridge the rail formation is wide enough to accommodate the trail, but this area is used as a KiwiRail access track to maintain the bridge, and generally KiwiRail do not permit cycle trails to use their maintenance access tracks. If they do, then fences need to be installed between the trail and the railway lines.

7.4.3.2 Following the highway

Following the highway south, the trail would run along a wide road shoulder and cross several driveways. Work would be required to define the trail and make crossing points safe. A 40m cutting would need to be widened, then filling would be required where the highway is formed on a 2-3m high embankment. The road reserve becomes narrow with only 2m between the road shoulder and the boundary, so a retaining wall would likely be required. The width of the road reserve gradually widens to 5m with several additional cuts and fills required.

1.3km south of Evansdale the railway and the road come together, with the railway running along the seaward side of the highway. There is very little room between the road and the railway. At its closest point the edge line on the road is just 10m from the rail centreline and the shoulder of the road is 8m from rail centreline.

KiwiRail regulations require the edge of the cycle trail to be at least 5m from the rail centreline, and a fence must be installed between the trail and the railway. This would leave just 3m between the fence location and the road shoulder upon which to build a cycle trail. This space is currently occupied by a drainage ditch that sits between the road and the railway line.

The ditch cannot simply be filled in as effective rail side drainage is essential to the operation of the railway line. If KiwiRail do permit the trail to be built here, a retaining wall would be required to support the trail so that the rail side drain remained functional. This is what has been constructed alongside SH88 to enable sections the Harbour Cycleway between Dunedin and Port Chalmers to be built. Note: in some places the Port Chalmers fence is only 3.5m from rail centreline. KiwiRail now require the fence to be at least 5m from rail centreline.

The vertical separation between the road and the railway varies from 0m to 5m. On average a 2-3m high retaining wall would be required so that the base of the wall extends below the ballast down to the rail formation. Approximately 1.7km of retaining wall would be required, with a solid handrail to protect against fall. Sub-soil drainage would also be required alongside the railway formation.

Construction close to the railway requires a full time Rail Protection Officer (RPO), and work must cease whenever a train comes past. This results in downtime, decreased productivity (up to 50% during Harbour Cycleway work) and additional costs. Material excavated from close to the rail lines may be contaminated with hydrocarbons from coal residue. If this is the case, excavated material would need to be disposed of off-site. On the Harbour Cycleway, building a low retaining wall (<1m high) alongside the railway cost $1200/m. $1800/m has been allowed for a wall which is 2-3m high, plus associated traffic management costs. A 10m bridge will be required over a small creek.

Figure 18. Timber retaining wall and fence between trail and railway line.

Due to the proximity of the trail to the highway, NZTA may also require a wire rope barrier installed between the trail and the highway. This would cost $250/m and the trail would need to be set 1.5m back from the barrier to allow for deflection. The wire rope barrier would result in trail users walking or riding several meters from vehicles driving at 100km/h, hemmed in between a fence and a barrier. This would not be the best user experience, and being close to the highway and the railway it carries additional construction risk. The estimated cost for a trail between the highway and the railway line is $5.5M ($5.9M allowing for 2 years cost escalation).

Figure 19. Wire rope barrier between trail and highway.

7.4.4 Recommended Route: Along the Edge of Blueskin Bay

The most appealing route would be to take the trail along the seaward side of the railway line, following the edge of Blueskin Bay. This would be furthest from the road and provide the nicest riding experience. From Waitati the trail would run along the north side of Doctors Point Rd to the mouth of the Orokonui Lagoon. Here it would dip under the rail bridge (KiwiRail bridge 208) then head north along the edge of the bay for 4km to KiwiRail bridge 204, just north of Evansdale. After passing under the bridge, an existing track beside Doctors Point Rd would link the trail to Waitati.

2.3km of the proposed trail would extend several meters into the bay, so it would need to be formed either by building a bench out of rock or by building a boardwalk. The remaining 1.7km of trail would be over dry or low-lying land, so it could be conventionally formed and raised with hardfill where necessary.

A boardwalk would be the better option as it would have minimal effect on the railway line or on the operation of the railway during construction, but building a boardwalk would be more expensive than constructing track with rock or hardfill,. Simple boardwalks without handrails can be built for $1000-2000/m, but a handrail will be required due to the potential fall height created by the incoming and outgoing tide. The boardwalk built for the harbour Cycleway cost around $5500/m, partially due to the specification requiring it to be 3m wide and strong enough to take a light service vehicle, and partially due to the length of piles required. The piles on the Harbour Cycleway boardwalk were up to 10m long as they were embedded by up to 5.5m, and in places casings and grouted piles were required. A barometric survey, probing and a robust geotechnical assessment along the edge of Blueskin Bay would be required to inform the design and determine an accurate boardwalk cost. Assuming a lighter-weight boardwalk could be constructed for $4500/m, the boardwalk part of the trail would cost nearly $11M, with the entire track costing $14.3M ($15.9M allowing for 2 years cost escalation). This route is around 1km longer to connect to Waitati compared to the route beside SH1 as it needs to run further east to pass under the rail bridge.

Figure 20 Port Chalmers shared path boardwalk

Another option is to widen the railway causeway using rock, forming a bench for the cycle trail. To obtain the necessary clearance from the railway line, the bench would need to be extend an average of 6m from the edge of the rail formation. Building the trail up to 2m above sea level would require approximately 14 cubic meters of self-compacting fill for every meter of trail. Rock fill revetment on the Harbour Cycleway cost around $200/m3 laid, so the track formation would cost $2800/m, about half the cost of a boardwalk. A fence would be required between the railway and the trail as well as fencing or handrails along the seaward side of the track. Installing fence posts into a rock sub-base can be challenging which adds to the fencing cost. Consideration would also need to be given to the type of track surfacing used, as a gravel surface may get damaged if waves were to splash onto the track. Fencing and gravel surfacing would be an additional $200-400/m depending on the type of fence installed. The estimated cost for building a trail along the edge of the bay constructed using rock infill is $9.7M ($10.8M allowing for 2 years cost escalation).

There may be consenting or cultural issues with reclaiming the edge of the lagoon, and there may be additional costs for a Rail Protection Officer (RPO) to oversee the works. Productivity may also be impacted by shutdowns when trains pass by. A short report has been prepared by Keith Probert considering the likely impact of infilling along the edge of the bay. This is included in Appendix 3.

Recommendation:

The preferred route for a trail connecting Evansdale to Waitati is along the edge of Blueskin Bay.

Distance	2.4km of boardwalk or infill, 2.1km of new track
Climbing	Flat
Grade	Grade1 (easiest) or Grade2 (easy)
Estimated cost	$9.7M for rock infill construction ($10.8M allowing for 2 years cost escalation)
Estimated cost	$14.3M for boardwalk construction ($15.9M allowing for 2 years cost escalation)

KiwiRail has provided “approval in principle” for the rail corridor between Coast Rd and Orokonui Lagoon (347.142 to 353.137 MSL) to be used for a shared use path. This is included in Appendix 2.

7.5 Waitati to Dunedin

The primary focus of this study is to investigate options for linking the Coastal Communities - Waikouaiti to Karitāne, and Warrington to Waitati. There would also be value in linking the Coastal Communities to Dunedin, particularly for Waitati and Warrington given their proximity to the city.

Between Waitati and Dunedin sit a range of hills that form the northern rim of Otago Harbour. The harbour is the drowned remnants of the giant Dunedin Volcano, which was centred close to Port Chalmers. Along this spine sit several peaks, the highest being Mt Cargill which has an elevation of 676m. A number of roads and tracks cross this spine, so there are several public access corridors that might be utilised for the construction of an off-road track. There are also areas of public land that could be used.

The route options can be broken into two groups.

- Routes beside roads, from Leith Saddle to the east. These have the least amount of climbing so would be better suited for commuting tracks. Most of these roads are currently used by cyclists.
- Routes running west of Leith Saddle via Hightop. These involve at least an additional 100m of climbing, and would be better suited to recreational routes.

7.5.1 Eastern Options

Route options are described from east to west, starting from the Dunedin side of the hills. Potential routes are shown on the map below, together with elevation profiles. The elevation profiles are drawn with their highest points cantered, so the heights and slopes of the different climbs and descents can be compared (Dunedin is to the left and Waitati to the right). Some routes share the same highest point (eg Leith Saddle and the Northern Motorway cross the hills at the same point).

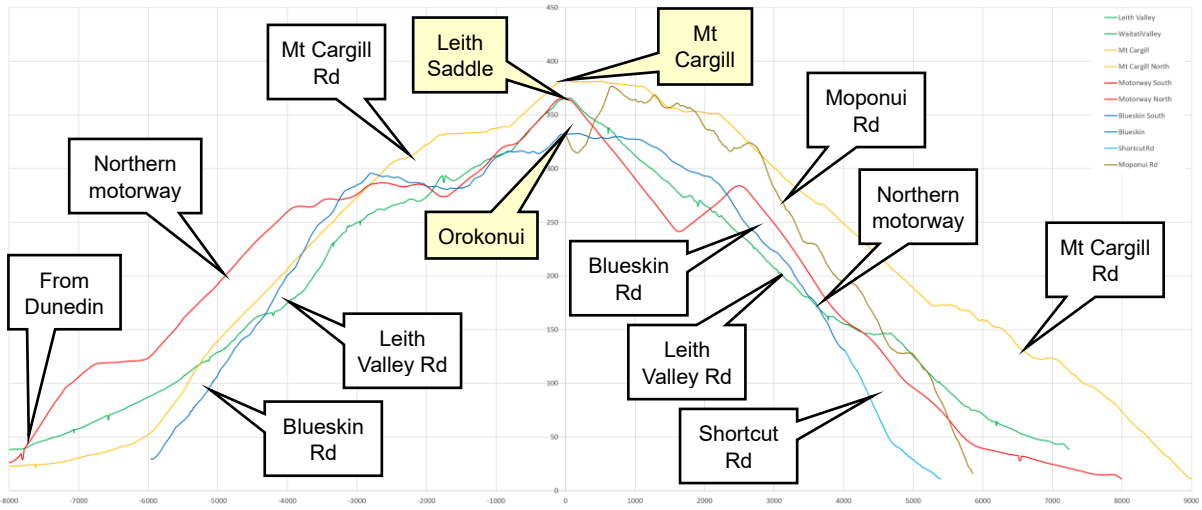


Figure 21. Elevation profile for eastern links to coastal communities (distance in m)

Looking at the profiles above, Leith Valley Rd and Waitati Rd have the most moderate gradients, hence their popularity with riders. Mount Cargill Rd is slightly steeper, and Blueskin Rd is steeper again. The Moponui Rd/track is the steepest option.

Figure 22. Eastern route options between Waitati and Dunedin. Preferred routes are shown in green, investigated routes in yellow. Solid lines show potential off-road trail. Dashed lines show roads or potential trail corridors beside roads.

7.5.1.1 via Aramoana

The route with the least amount of climbing would follow the coastline around the northern edge of the harbour. From Port Chalmers a narrow road winds alongside the water's edge for 9.6km to Aramoana. For most of the way, space alongside the road is very limited and the only option for an off-road trail would be to build out into the harbour, which would be expensive.

There is Public Conservation Land (PCL) between Aramoana and Heyward Point, but there are large bluffs along the coast that extend to an elevation of 150m. Building a shared use trail through the bluffs is not practical, and there is not sufficient room to zig-zag a low-gradient trail up and over them. Building a trail around the coast via Aramoana is not a viable option.

Conclusion:

It will not be possible to build a Grade2 or Grade3 trail from Port Chalmers to Waitati via Aramoana.

7.5.1.2 Beside the Railway

The Main South Line runs from Port Chalmers north through the hills. It gently climbs to an elevation of 97m, then enters the Mihiwaka tunnel. The tunnel is 1.3km long, topping out at an elevation of 115m before the railway descends back towards the coast. Public access through the tunnel is not permitted, and there is no possibility of sharing it with trains. Portions of the rail corridor could however be used.

Conclusion:

It will not be possible to build trail entirely following the railway line due to the tunnel.

7.5.1.3 Using Paper Roads

East of Blueskin Rd, five paper roads run from Aramoana Rd up to Heyward Point Rd. Most of the paper roads are fall-line and all are too steep to be used for the construction of a shared-use trail.

Conclusion:

The paper roads are not suitable.

7.5.1.4 Beside Blueskin Rd and Heyward Point

Given that it's not possible to build a trail around the coast from Aramoana because of the bluffs, another option is to climb up to Heyward Point Rd and go over the bluffs. Blueskin Rd runs from Port Chalmers up to Hayward Point Rd at an elevation of 285m. Overall it has a moderate gradient, but there are some steeper sections of road that are outside the Grade 2 trail specification (see Table 3). This is mainly due to the length of the road corridor that is above the permitted average gradient rather than the maximum gradient (ie. the road corridor isn't excessively steep, more that it exceeds the average gradient for stretches that are too long). If a trail was built beside the road it would likely be a Grade 3 (intermediate) trail once some humps and hollows are accounted for.

Heyward Point Rd meanders along the ridge heading east from Blueskin Rd, gradually dropping down to an elevation of 204m. The ridge rises and falls, so over the 6.1km road there is 160m of climbing. 30% of the road is steeper than a Grade2 trail, and 10% is steeper than the Grade3 specification. The gradient of a trail beside the road could be reduced if access over private property was obtained.

Building a trail beside Blueskin Rd road would be particularly challenging and expensive due to the narrow road reserve and the steep terrain above and below the road. Retaining walls would be required in places, requiring engineering input from the DCC roading department.

Building a trail alongside Heyward Point Rd would be slightly easier, but there are also steep slopes above and below the road. On both roads, access over private property would be necessary in places as the road reserve doesn't entirely capture the road formation.

Conclusion:

It will be difficult and expensive to build a trail alongside Blueskin Rd or Heywood Point Rd. The gradient of the road reserve is too steep to build a Grade2 (Easy) trail. If a trail was built it would be at the upper end of a Grade3 (Intermediate) trail.

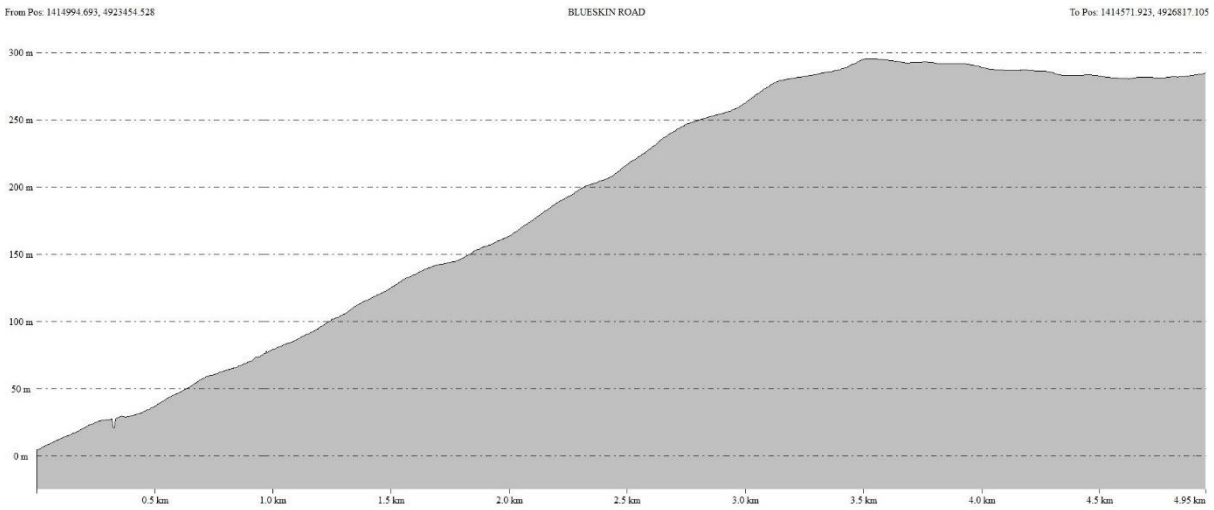


Figure 23. Blueskin Rd elevation profile

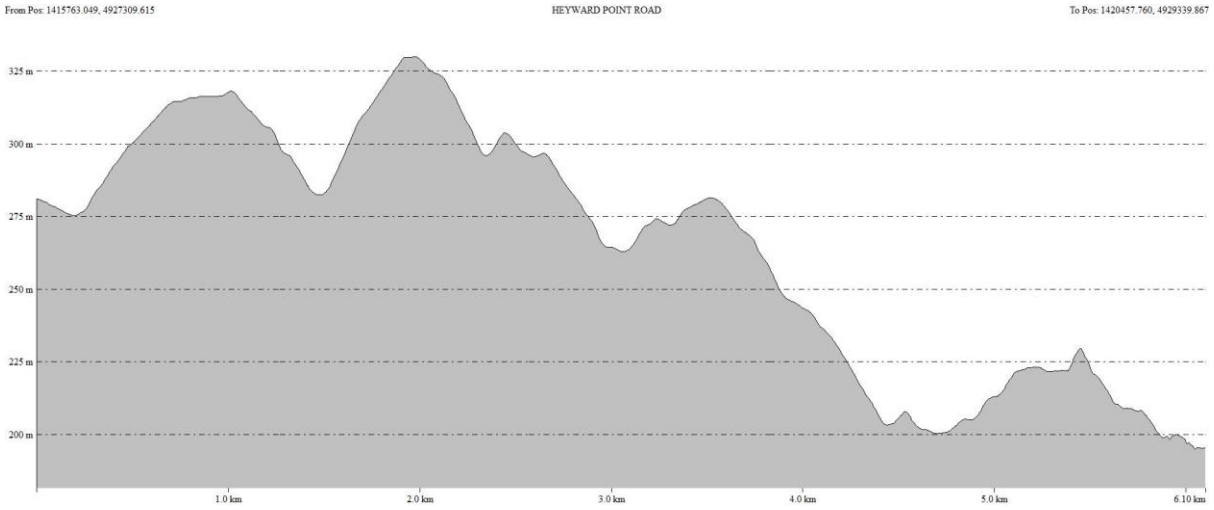


Figure 24. Heyward Point Rd elevation profile

Potential routes from Heyward Point to Long Beach were investigated. A trail could zig-zag down from Heyward Point Rd through the PCL to Kaikai Beach. There is a paper road that links the PCL to the coastal reserve land, but this is far too steep for a cycle trail (part of it goes down a 25m bluff). Access over private property would be required to make this link, and construction of an easy graded track would be difficult due to bluffs west of Heyward Point.

There is coastal reserve along Kaikai Beach, but a trail from Kaikai Beach to Whareakeake would again need to cross private land to climb above 40m bluffs. Whareakeake has a strip of coastal reserve, but the 60m bluffs above Pilot Point would require another easement over private land. From here, construction should be possible through to Long Beach using a combination of LINZ land, PCL and paper roads.

Building a trail from Long Beach north around the coast would be challenging and require additional easements over private property. There are 100m bluffs at the north end of Long Beach which get lower as you head north, but they are still 25m high where the access along the coast starts to get bluffed out. Structures could be built to make this work, but they would be expensive and at risk being close to the water. If a trail could be developed up through the bluffs, 3 separate easements would be required to link to the road reserve around Potato Point through to Purakanui.

Through Purakanui there are existing tracks and roads that could be used for most of the way around the inlet, but another easement over private property would be required. From Purakanui Rd the trail could follow Osborne Rd, then there is a paper road that links to the rail reserve, and the rail corridor could be followed through to Doctors Point. Note: Landowners along this route have not been contacted.

This route would be a stunning ride or walk. It would link together all the communities between Aramoana and Waitati, pass multiple beaches and climb over several bluffs which would provide spectacular views. However, the nature of the terrain would make the construction of a trail difficult, especially an easy-graded trail where it takes a significant of length of trail to gain height. At least 6 easements over private property would be required. Not all of the trail could be built off-road, with some sections on quiet local roads. The parts of the trail beside the railway line would require additional engineering to meet KiwiRail construction standards. If a trail was to be developed along this route, it would be more practical to build a steeper shared-use trail such as a Grade4 (advanced) trail, or a walking/tramping route.

Conclusion:

It would be possible to build a trail from Heyward Point to Waitati, but the construction of an easy-graded trail would be difficult and expensive. Several easements over private property would be required, and in places the trail would have to be on-road. It would be significantly longer than other options, so not as well suited for commuting. It would be a highly desirable route in terms of views and rider experience, so better suited for a recreational trail.

7.5.1.5 Recommended Route: Using DCC Property and Orokonui Ecosanctuary

Rather than following Blueskin road from Port Chalmers, a more buildable route is to follow the railway line north, then before the Mihiwaka tunnel head west and zigzag up through a block of DCC owned property. This freedom of space would allow a trail to climb at a gentle gradient all the way up to Heyward Point Rd at an elevation of 286m. Construction would be relatively simple and inexpensive, as the 3.5km of climbing trail would be away from road and rail. The first 1.8km of the trail alongside the railway would require additional engineering/cost to satisfy KiwiRail design requirements however. The trail through the DCC property would be within native or regenerating bush, with several patches of virgin bush with large podocarps.

From Heywood Point Rd the trail would continue north to Orokonui Ecosanctuary along the low side of Blueskin Rd. This would require easements over two properties, as the road reserve is not continuous. The ground is steep immediately below the road, so moving the trail down the hill would prevent the road from being undercut and lower construction costs. This can be done by keeping the trail within a strip of bush, so it could be built to a Grade2 standard with little impact on the properties below the road. Instead of fencing along the edge of the trail, the fence could be placed along the edge of the bush which is better for the farmers and nicer for trail users.

Linking the trail to the Orokonui Ecosanctuary adds significant value to the trail. It provides a destination for local trail users, as well as a resting point at the top of the hill for people passing through. It has toilets and a cafe, both of which would be well used given that it's a 320m climb from both Waitati and Dunedin. Many users of the trail would be likely to take the time to visit the ecosanctuary itself, so the trail would effectively support the operation of the ecosanctuary.

Recommendation:

Build a Grade2 trail alongside the railway from Port Chalmers, then up through DCC property to Heyward Point Rd, and alongside Blueskin Rd Orokonui Ecosanctuary. This will be easiest and most direct way to link Waitati to Dunedin. It will also be the least expensive and most buildable option, providing an excellent riding experience.

Below is a map of the proposed trail from Port Chalmers to Orokonui Ecosanctuary. The route has been designed using LiDAR generated contour data using a well-proven methodology, however it hasn't yet been proven in the field.

Distance 6.9km (new trail)

Climbing 326m (from Port Chalmers)

Grade Grade2 (Easy)

Estimated Cost $1.4M ($1.6M allowing for 2 years cost escalation)

Land access:

- Three private landowners have agreed to provide access over their property for the trail.
- The DCC and the current lessee have agreed to modify the terms of the lease to enable the trail to pass through the DCC property.
- Approval in principle from KiwiRail hasn't yet been applied for, but this is expected to be granted (as it has been for two other sections of trail).

Connections:

- Port Chalmers to Orokonui
- Mihiwaka & Mt Kettle via the Cedar Creek walking tracks
- Mopanui track and McKessar track via Mopanui Rd
- Orokonui Ecosanctuary tracks

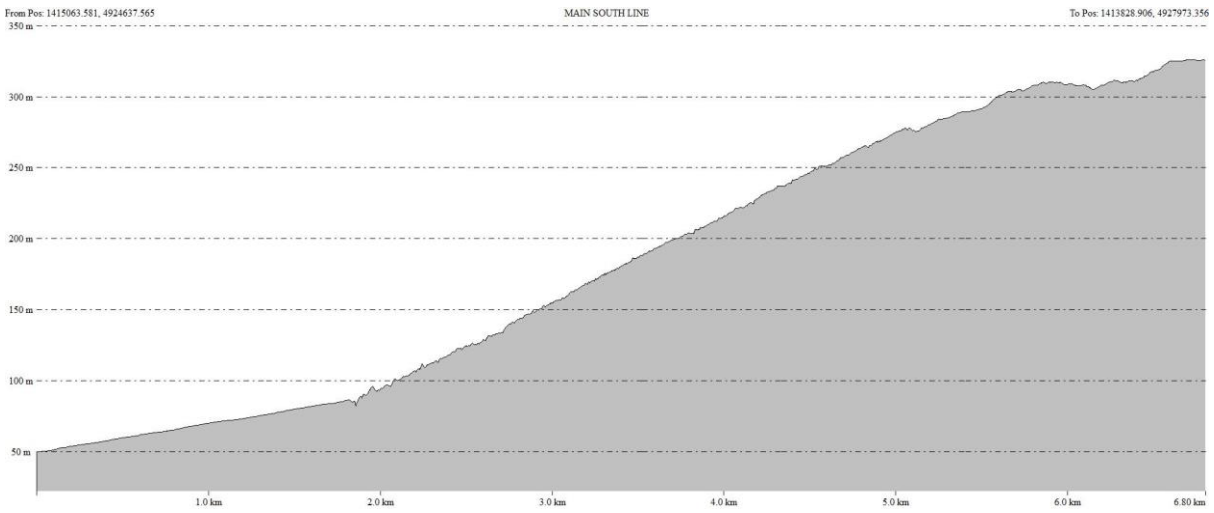


Figure 25. Elevation profile of proposed trail from Port Chalmers to the Orokonui Ecosanctuary

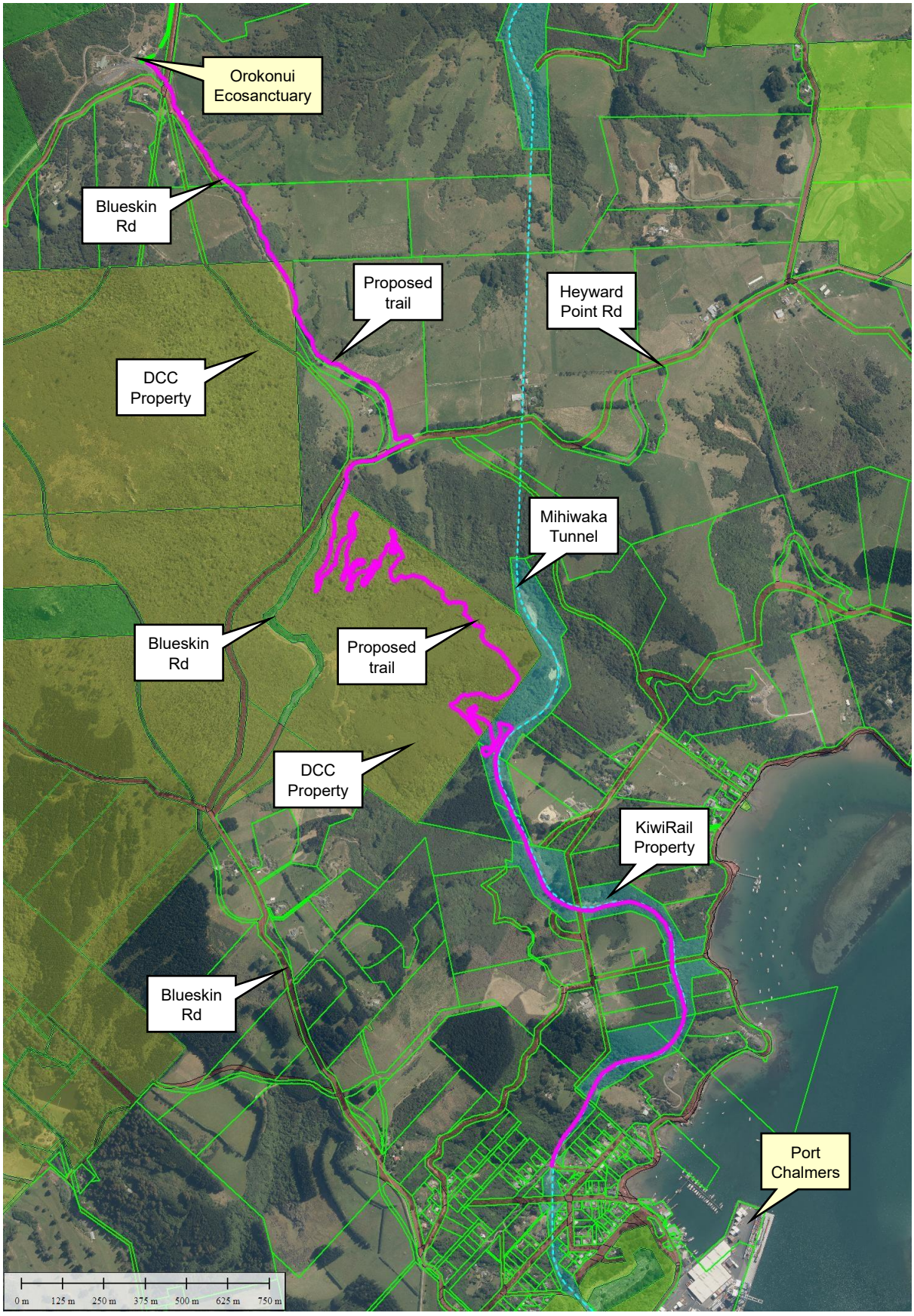


Figure 26. Map of proposed trail from Port Chalmers to the Orokonui Ecosanctuary

Several routes were investigated between Orokonui Ecosanctuary and Waitati.

7.5.1.5.1 Through Orokonui Ecosanctuary

The largest block of publicly owned land on the northern side of the hills is Orokonui Ecosanctuary. It would be relatively easy to build a trail through the reserve as the trail wouldn't be constrained by roads or property boundaries. The trail would run from the top of the Ecosanctuary down to the bottom, through native bush and past the tallest tree in NZ. It could use sections of the existing tracks, and it could be shared by visitors to the Ecosanctuary. Riders would need to pass through the boundary fence, and it was proposed that a monitored dual-gate system be implemented.

A proposal for a trail through the reserve was submitted to the Ecosanctuary board. It was not deemed to be workable, as it posed too much risk to the integrity of the barrier fence.

Conclusion:

It will not be possible to build a track through the Orokonui Ecosanctuary to Waitati.

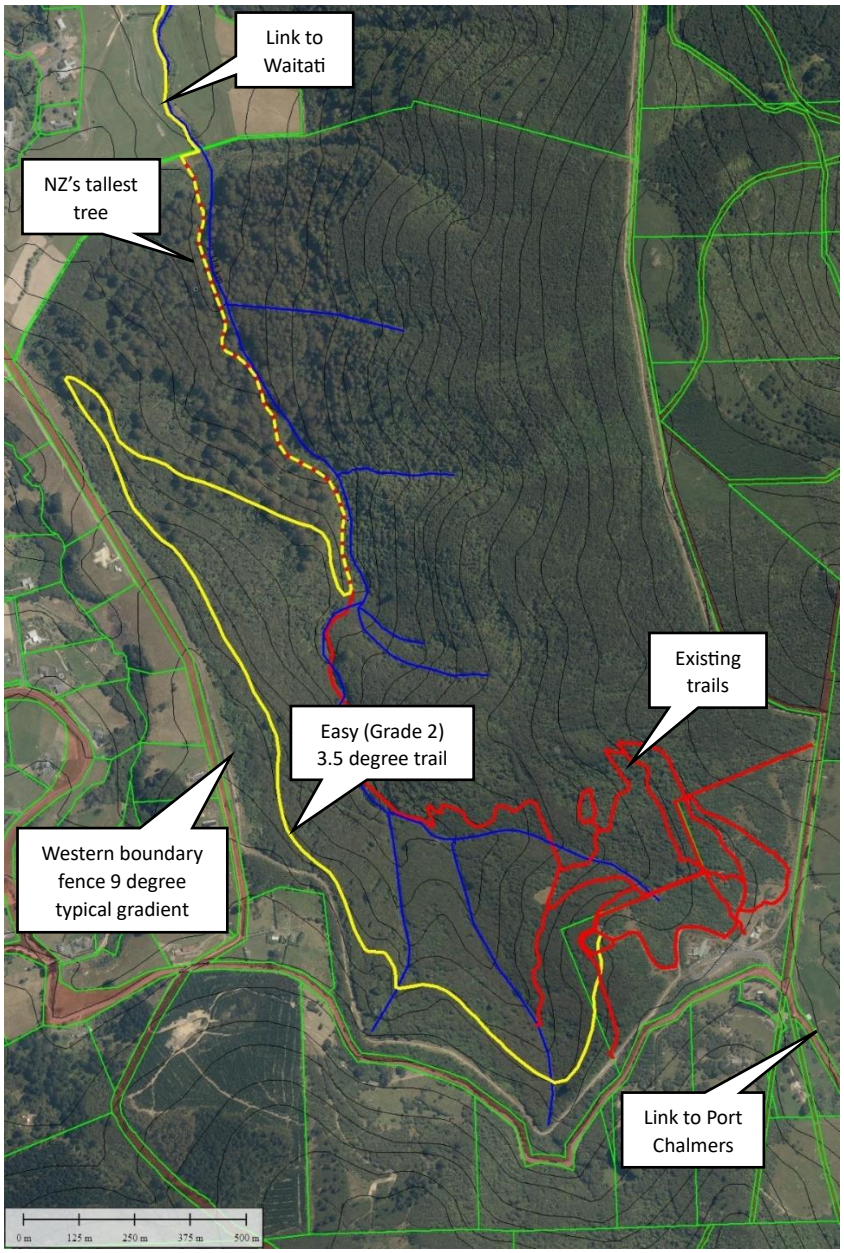


Figure 27. Map of a concept trail through the Orokonui Ecosanctuary

7.5.1.5.2 Via Mopanui Rd

Mopanui Rd dips down from Blueskin Rd then climbs around Mopanui. From the car park at the end of the road a paper road (used as a walking track) runs straight down the ridge to White Rd. This crosses the railway line and finishes on Doctors Point Rd. The formed section of Mopanui Rd is steeper than a Grade2 or Grade3 trail, but there is a strip of land between the road and the Ecosanctuary fence where a track could zig-zag up the hill at a lower gradient. The unformed section of Mopanui Rd is very steep, technically at least a Grade4 (Advanced) trail. Access over adjacent private property would be required to build an easier trail down the ridge to Doctors Point Rd.

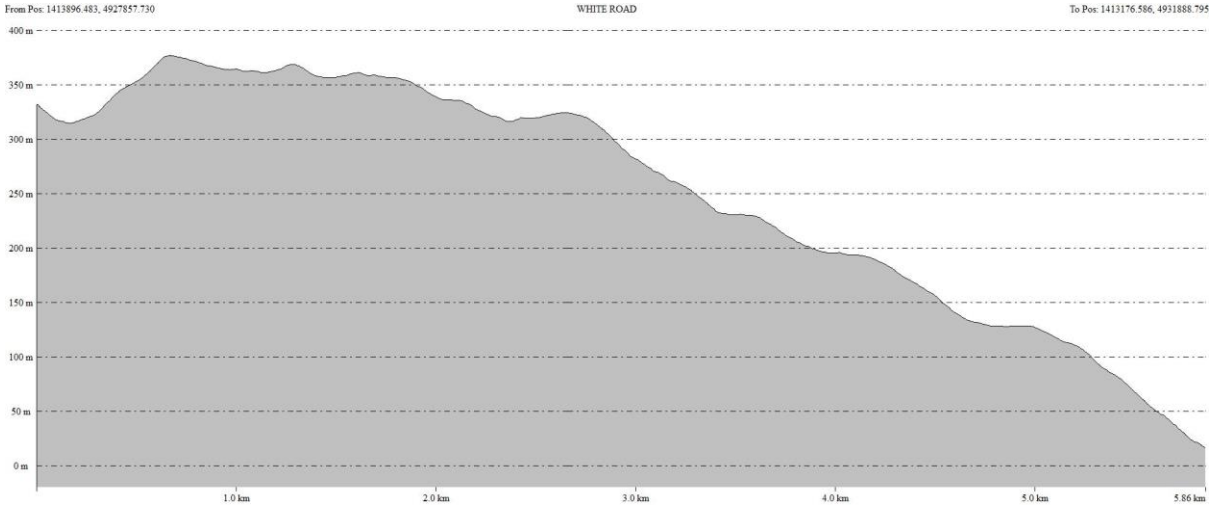


Figure 28. Mopanui Rd elevation profile

Conclusion:

The unformed section of Mopanui Rd is too steep to use for a shared use trail.

7.5.1.5.3 Beside the Orokonui Ecosanctuary western fence

The western fence of the Ecosanctuary traverses below Blueskin Rd then drops down beside Cedar Creek Rd. It has a steep section at the 1.1km mark which can't be avoided due to property boundaries. The fence beside Cedar Creek Rd is also steep in parts, and where the road ends at the 2.8km mark, there is no moderately-graded way to get to the bottom of the valley. Only 67% of the route would be Grade2, and more than 20% of the route would be steeper than a Grade4 trail.

Conclusion:

A Grade2 or Grade3 trail cannot be built around the western side of the Orokonui boundary fence.

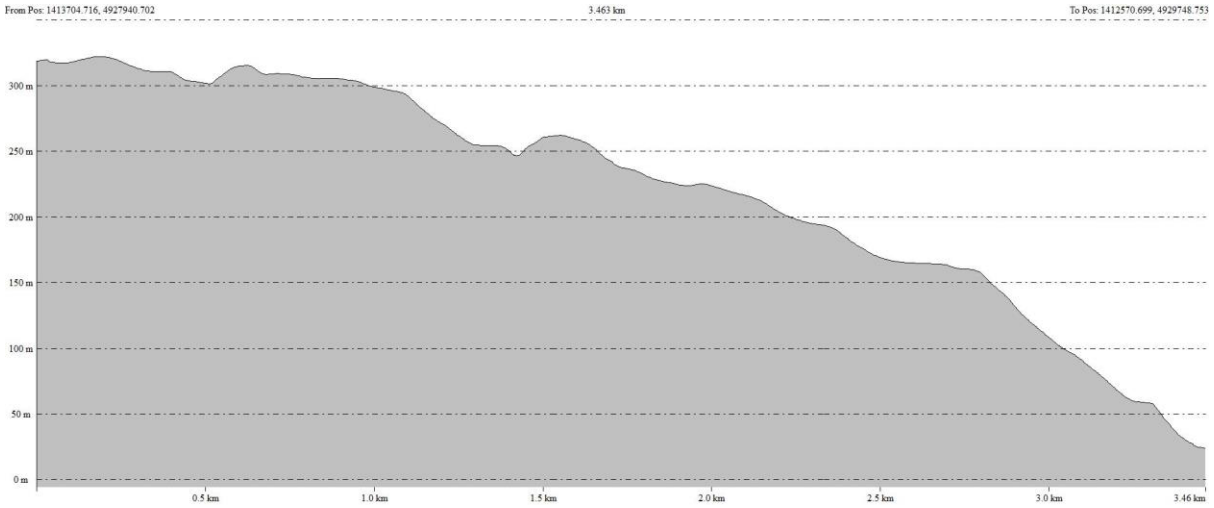


Figure 29. Orokonui Ecosanctuary western fence elevation profile

7.5.1.5.4 Via Blueskin Rd

From the Ecosanctuary, Blueskin Rd drops down the northern side of the hill to Waitati, linking onto Mt Cargill Rd or Shortcut Rd. As with the road on the southern side of the hill, it would be difficult and expensive to build trail alongside the road. Access through multiple private properties would be required as there are 34 different lifestyle blocks along the road. 74% of the route would be Grade2 and 88% would be Grade3.

Conclusion:

It would be difficult to build a trail beside Blueskin Rd from the Orokonui Ecosanctuary down to Waitati. Multiple easements would be required.

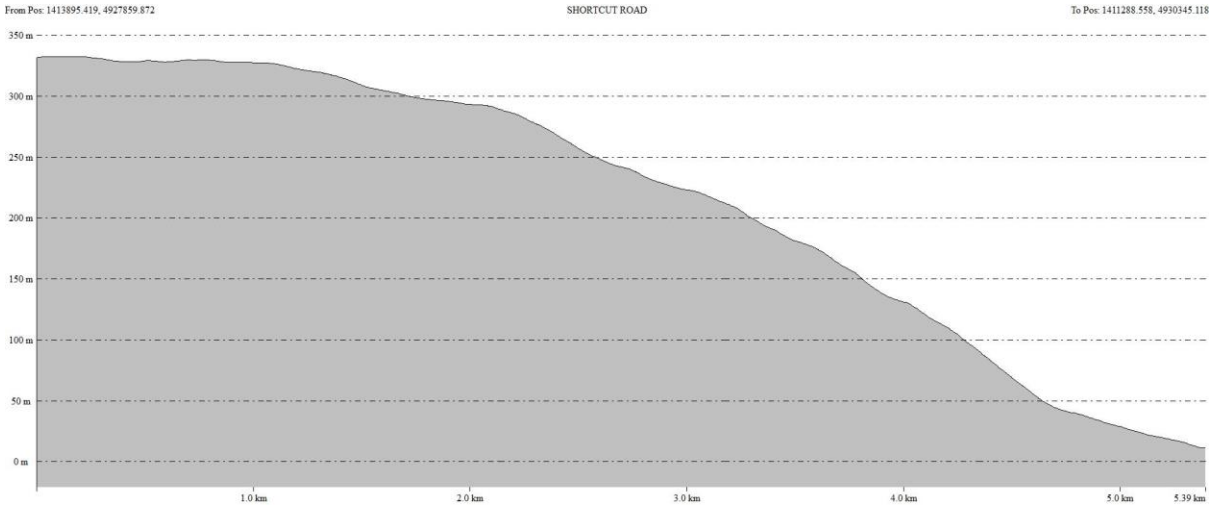


Figure 30. Blueskin Rd onto Shortcut Rd elevation profile [LINZ Data Service]

7.5.1.5.5 Recommended Route: Beside the Orokonui Ecosanctuary eastern fence

The eastern fence of the Ecosanctuary is slightly less steep than Mopanui Rd, so provided that the Ecosanctuary allow cyclists to use their service track beside the fence, a Grade2 or Grade3 trail could be constructed beside the less steep sections of fence, and a series of switchbacks could be built between the road and the fence to reduce the gradient where necessary.

The fence beyond the 3.2km mark drops straight down the hill, so it is too steep to build a trail beside. Up until this point, 71% of the fence is at a Grade2 gradient, 84% within Grade3 specifications and 94% within Grade4. Less than 1km of new trail would be required to ease the steeper sections to make all of the trail Grade2. This would however require an easement over neighbouring land, or require sections of the Orokonui boundary fence to be moved.

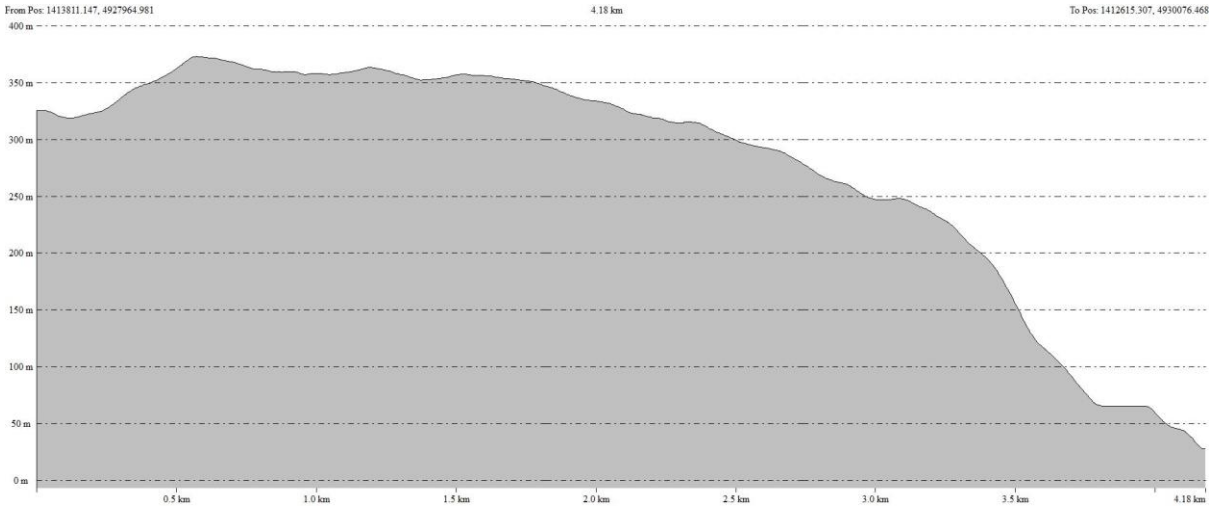


Figure 31. Orokonui Ecosanctuary eastern fence elevation profile

Below the point where the fence steepens, a neighbouring landowner is prepared to allow an easement over their property. The initial design zigzagged through a bush block on the margins of the ecosanctuary then crossed to Orokonui Lagoon. From there it would run beside Orokonui Rd, sharing parts of the existing track or via a new track. Going around the lagoon would add value to the trail, link to the school, then run through Waitati before continuing up the coast. This would ensure that all users of the trail pass through Waitati, so Waitati would get maximum benefit from the trail. This could be built as a Grade2 (easy) trail and is shown in yellow on the map below.

To minimise disruption to farming operations, a route further north has been developed (the pink line). This would descend through a pine block before running along a boundary fence, then down Chelivode St to Doctors Point Rd. A new bridge would be required over the mouth of the lagoon, then riders would cross the road to get onto the existing trail that runs along the north side of the road into Waitati. Most of this could be built as a Grade2 trail, with some short sections of trail steeper at a Grade3 standard (Advanced).

Conclusion:

A Grade2 or Grade3 trail can be built around the eastern side of the Orokonui boundary fence and down to Waitati. This will require an easement over two private properties, and the landowners are prepared to grant an easement.

Distance	7km (new trail)
Climbing	382m (from Waitati)
Grade	Grade2 (Easy), some Grade3 (advanced)
Estimated Cost	$1.15M ($1.28M allowing for 2 years cost escalation)

Land access:

- Two private landowners have agreed to provide access over their property for the trail.
- The CMS permits bike tracks to be considered on PCL (Orokonui Scenic Reserve).

Connections:

- Port Chalmers to Orokonui
- Orokonui Ecosanctuary tracks
- Mopanui track and McKessar track via Mopanui Rd

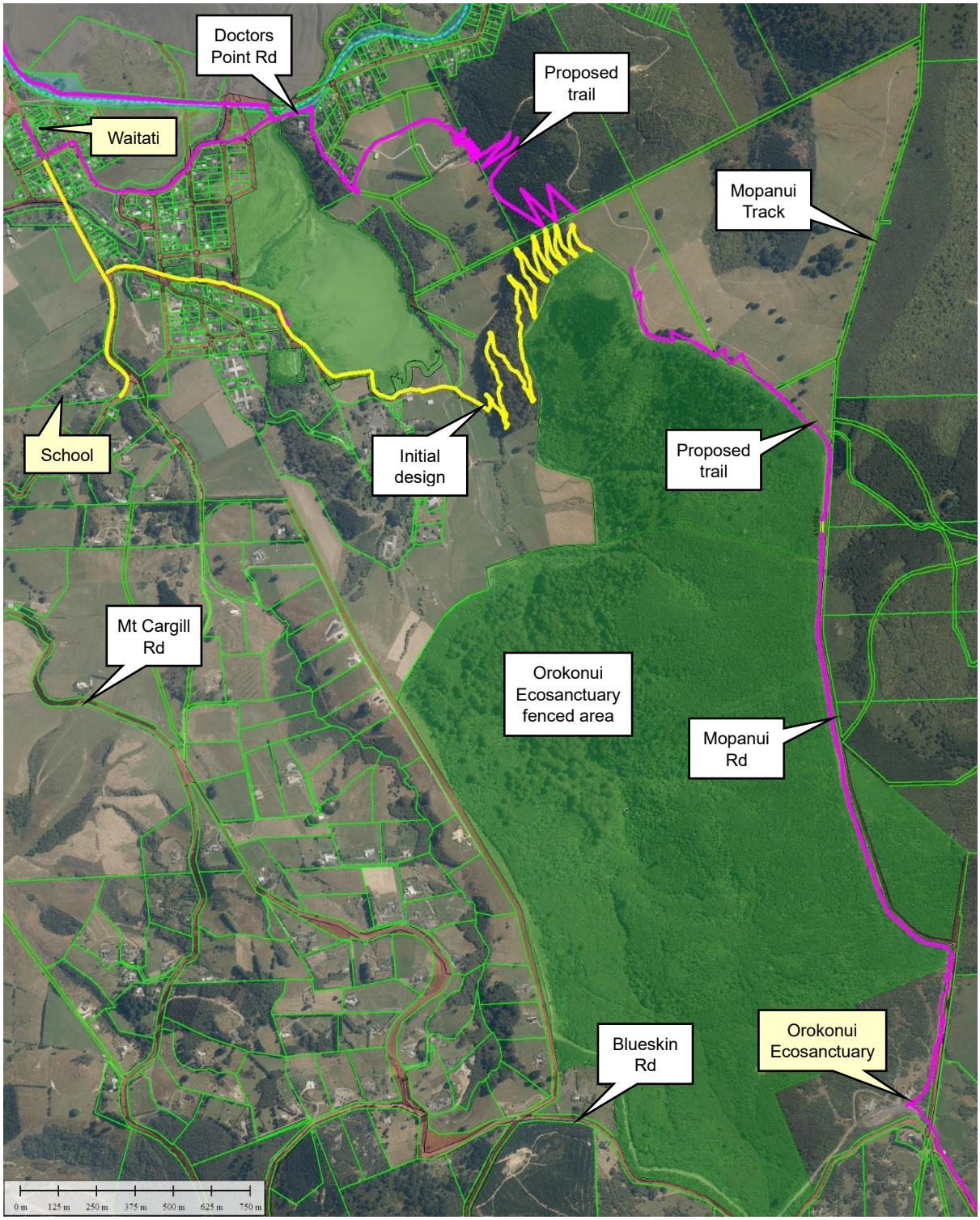


Figure 32. Map of proposed trail from Waitati to the Orokonui Ecosanctuary

7.5.1.6 Leith Saddle

Another route between Dunedin and Waitati is via Leith Saddle. Two roads pass over Leith Saddle.

7.5.1.6.1 via Leith Valley Rd and Waitati Rd

From Dunedin, Leith Valley Rd climbs up to the saddle, then Waitati Valley Rd drops down to Waitati. These roads are mostly gravel and are used by recreational cyclists when they do the "Waitati Loop". A significant portion of the road cuts through a steep sided valley and it will not be possible to build an off-road trail. If there was room, there would be little point building a gravel track beside a gravel road as people would likely choose to ride on the road. In terms of gradient, Leith Valley Rd is 94% Grade2, with 3% at Grade3. Technically the route is classed as a Grade3 (Intermediate) ride, as cyclists are sharing the road with vehicles and the speed limit is 100km/h.

Conclusion:

It would not be possible to build an off-road trail beside Leith Valley Rd. An on-road Grade3 trail is the only option.

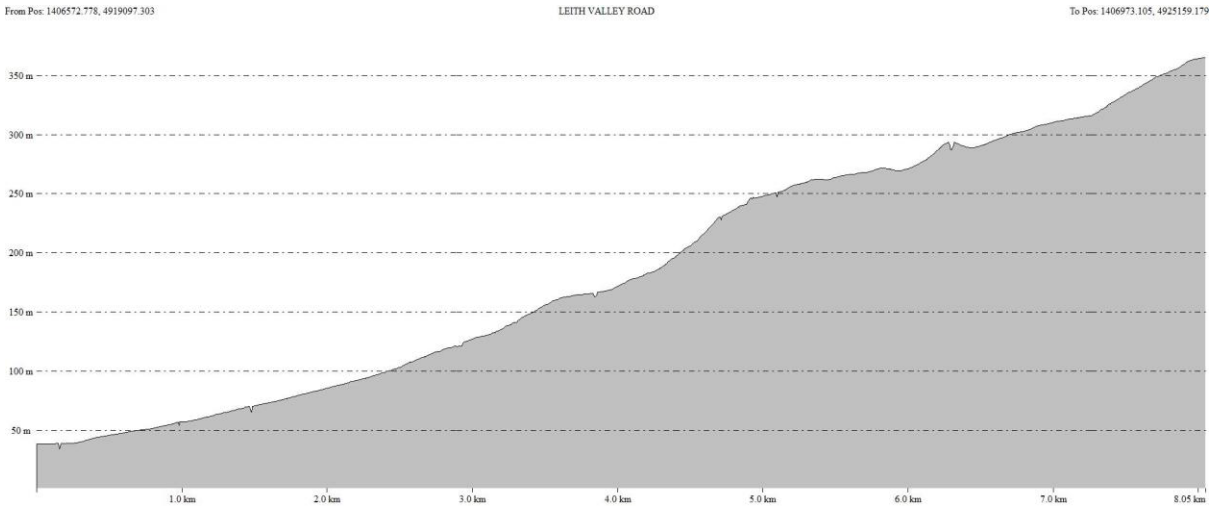


Figure 33. Leith Valley Rd elevation profile

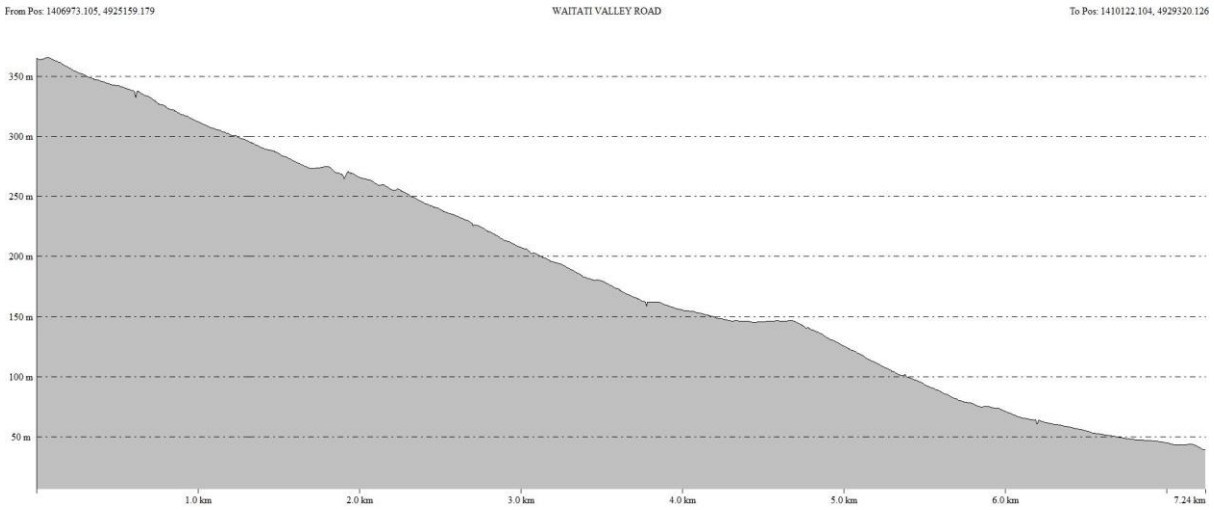


Figure 34. Waitati Valley Rd elevation profile

7.5.1.6.2 via the Northern Motorway

Another corridor of public land linking Dunedin to Waitati is the Northern Motorway. Cyclists are not permitted to use the motorway, but a trail could be built within the road reserve. The motorway is the moderately graded, but to achieve this, large cuts and fills have been made to form the road, so building a trail within the road reserve would be difficult and expensive.

At the southern end of the motorway there is very little space between the highway and private properties, and the situation is similar at the Waitati end of the motorway. Easements over private property would be required. Riding beside a busy motorway (AADT=7343) would be the least pleasant riding experience, so this option is not recommended.

Conclusion:

A cycle trail beside the motorway would not be desirable and would not be easily buildable.

7.5.2 Western Options

West of Leith Saddle much of the land is publicly owned, held either by the DCC, DOC, or City Forests (a DCC owned company). As the crow flies, it is 5km from Leith Saddle (elevation 366m) to the high point on Steep Hill Rd (elevation 422m) via Hightop. Several walking tracks pass through this area, but they are too steep to be ridden in both directions (some are ridden downhill).

If a rideable track was constructed between Leith Saddle and Steep Hill Rd, it would enable additional on-road and off-road links between Dunedin and each of the coastal communities (Waikouaiti/Karitāne, Evansdale/Warrington and Waitati). These routes would be longer and involve more climbing than the routes available further east, so they wouldn't be as attractive for commuting. They would however make great recreational rides, and make numerous loop rides possible, creating opportunities for tourism.

These routes and their elevation profiles are shown below. A track via Hightop would require 100m more climbing than Leith Saddle, and Swampy Summit an additional 350m. Rollinsons Rd is steeper than Leith Saddle Rd, and the Swampy Spur track is also steep. Careys Creek has a moderate gradient, and while the average gradient of Steep Hill Rd and Mountain Rd is also low, they both rise and fall a lot so involve additional climbing. Double Hill Rd is very steep.

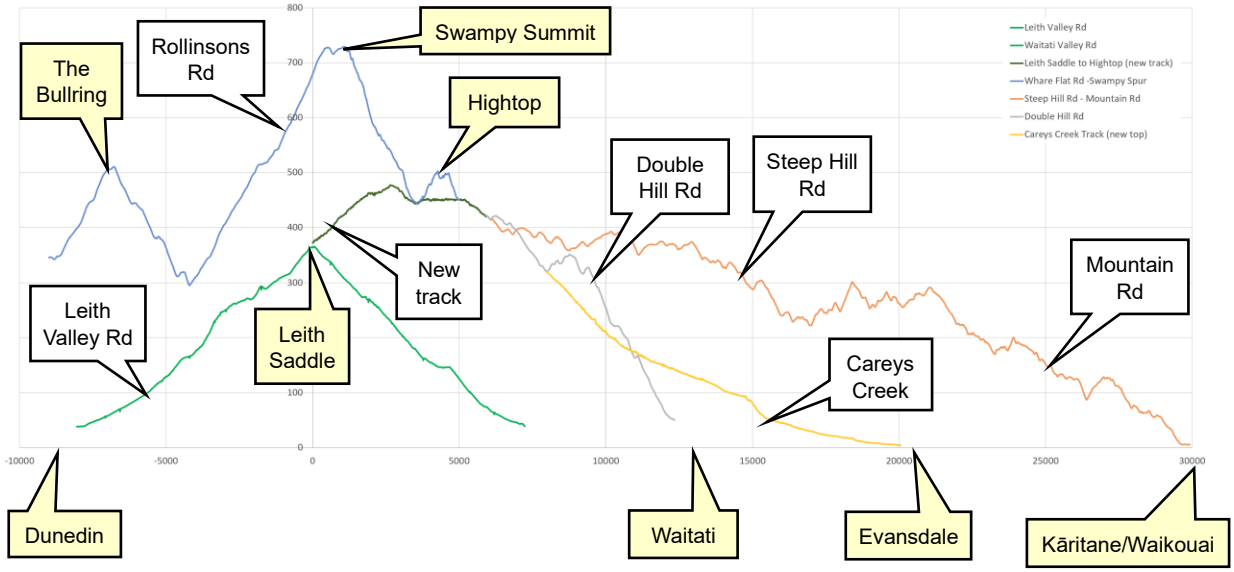


Figure 35. Elevation profile for western links to coastal communities (distance in m)

7.5.2.1 Link between Leith Saddle and Steep Hill Rd

Currently the Pipeline Track runs north from Leith Saddle for approximately 3km. This climbs gently and if gravelled it would be useable as a shared use trail. 4.5km of new track would be required to link the Pipeline Track to Steep Hill Rd (Mountain Rd) as a Grade2 trail. To get around a block of privately owned bush, this track would need to climb to an elevation of 476m. Parts of existing steeper tracks could be used to build a higher grade (more difficult) trail.

Note: This track could possibly form part of the "3 Peaks Trail", a proposed shared-use track circumnavigating Dunedin linking Swampy Summit to Mt Cargill to Signal Hill. Part of this proposal was to link Leith Saddle to Swampy Ridge.

Distance	4.5km of new trail, upgrade 3km of existing trail
Climbing	150m from Leith Saddle
Grade	Grade2 (Easy)
Estimated Cost	$723,000 ($826,000 allowing for 2 years cost escalation)

Land access:

- Over DCC, DOC and State Forest.
- The CMS permits bike tracks to be considered on PCL (Silverpeaks Scenic Reserve).
- 30m of climbing and would be saved by obtaining an easement over private property.

Connections:

- Steep Hill Rd to Leith Saddle
- Leith Valley Rd and Waitati Valley Rd
- Semple Rd and Mountain Rd
- Swampy Ridge track, Rustlers Ridge track, Burns track, Green Hut track, Leith Saddle track
- Careys Creek track

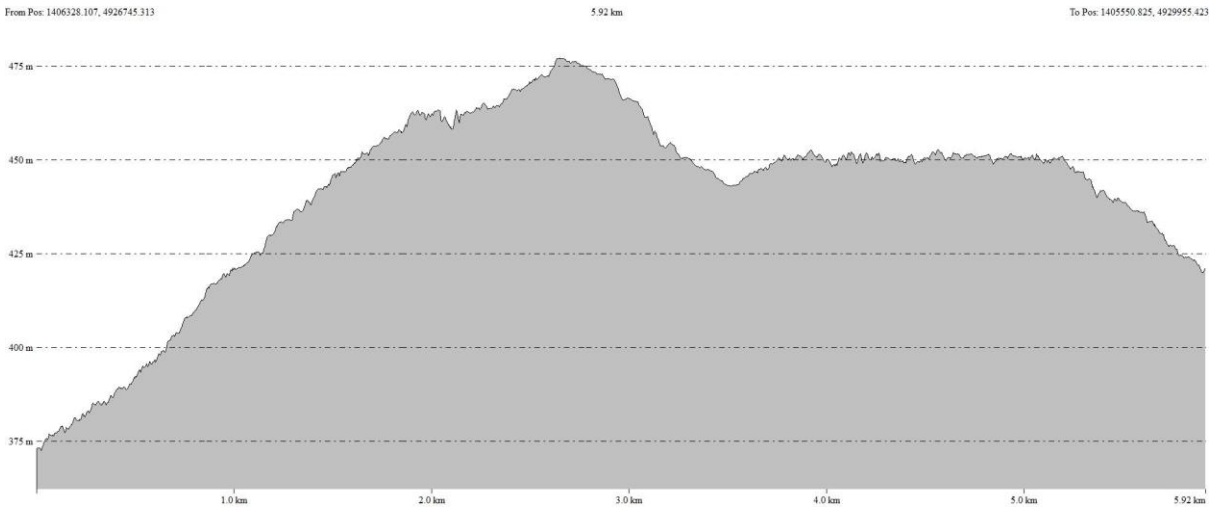


Figure 36. Elevation profile of link from Leith Saddle to Steep Hill Rd

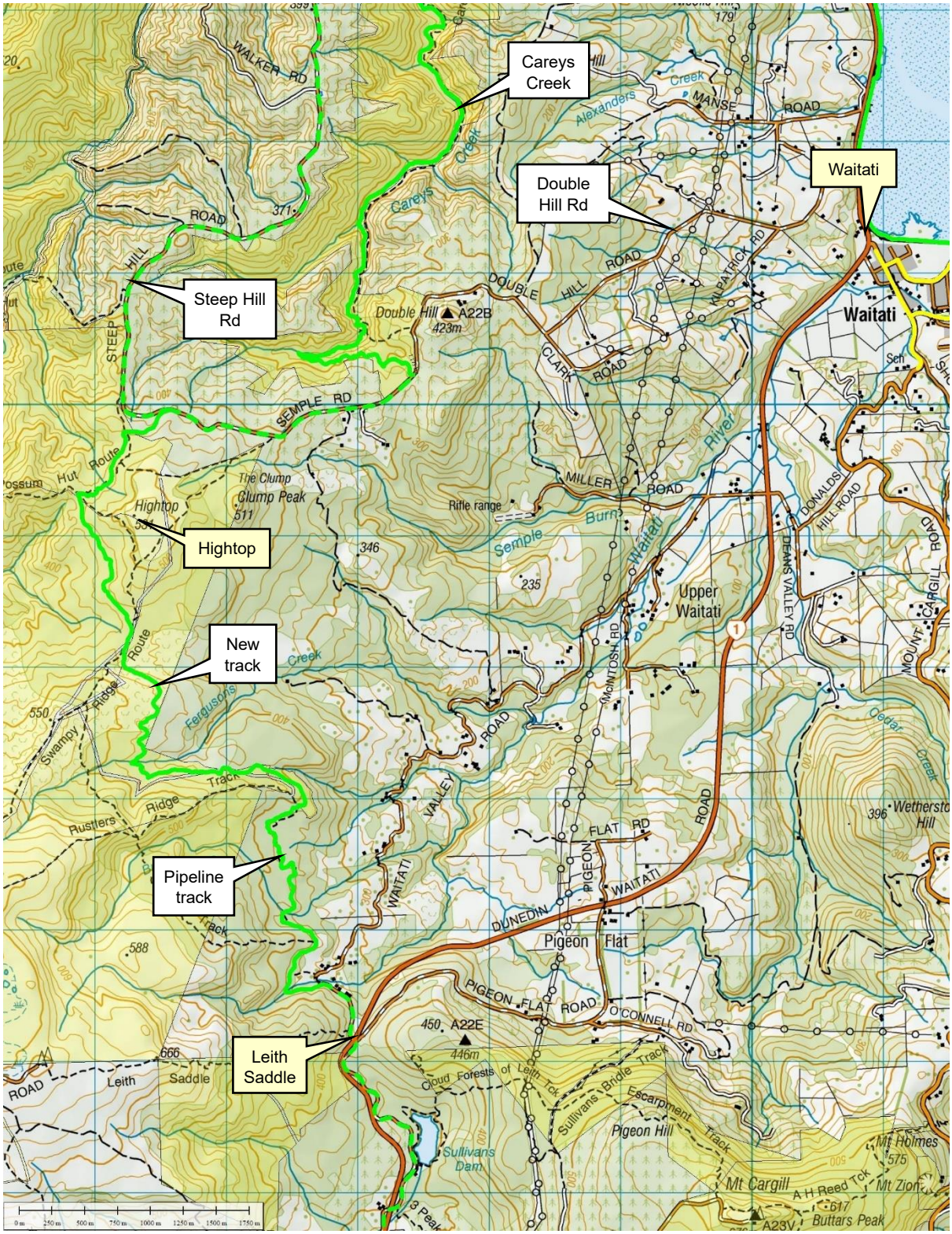


Figure 37. Link from Leith Saddle to Steep Hill Rd. DCC reserve land and PCL is shown in yellow.

7.5.2.2 Waitati via Semple Rd / Double Hill Rd

Dropping down Steep Hill Rd to the east leads onto Semple Rd, then onto Double Hill Rd. Double Hill Rd ends on SH1, 500m north of Waitati, so users would need to ride along SH1 for a short distance to Waitati. Double Hill Rd is relatively steep, so this would be at least a Grade4 ride, with only 77% of

the route being within the Grade3 specification. It would be more likely to be ridden in the downhill direction.

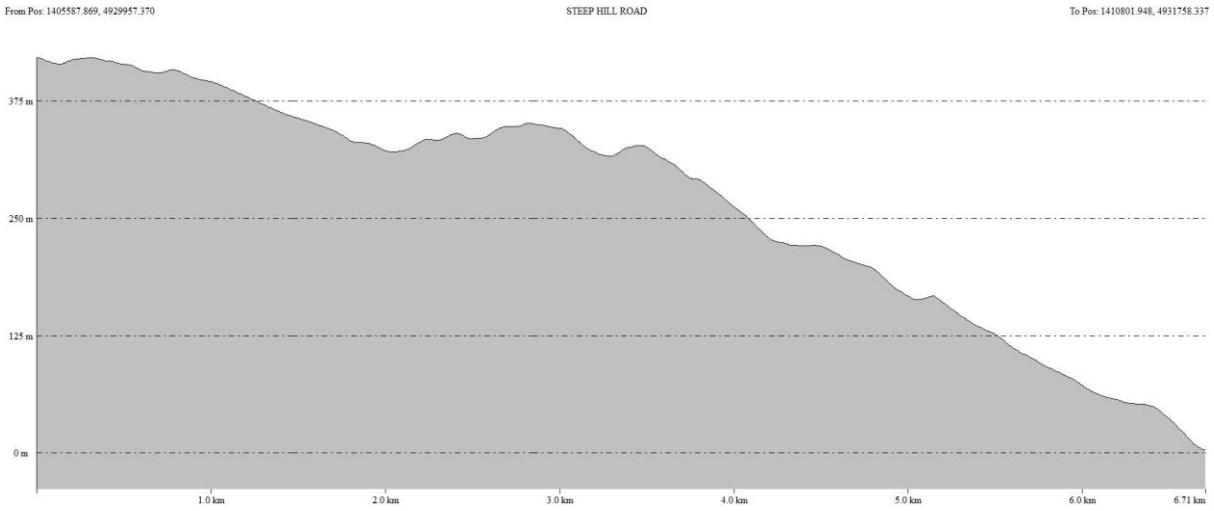


Figure 38. Semple Rd/ Double Hill Rd elevation profile

7.5.2.3 Evansdale via Careys Creek

The Careys Creek track could be upgraded to provide an almost entirely off-road route between Leith Saddle and Evansdale. The gradient of the trail is mostly Grade2, but it has numerous creek crossings and some steep pitches where the trail has been re-routed around slips, so it would be more practical to upgrade it to a Grade3 standard. The link track from Leith Saddle would take people through to Steep Hill Rd (the top of Mountain Rd), where riders would turn right and drop down Semple Rd. The Careys Creek track starts just before Double Hill, and currently descends steeply down the ridge to the creek. Approximately 1.6km of new track would be required to take riders down to the creek at a more moderate gradient. From here they would follow the existing track for 10.9km to Evansdale. This would be a high-quality riding experience, suited to more adventurous single-track riders. It should be able to be made rideable in both directions.

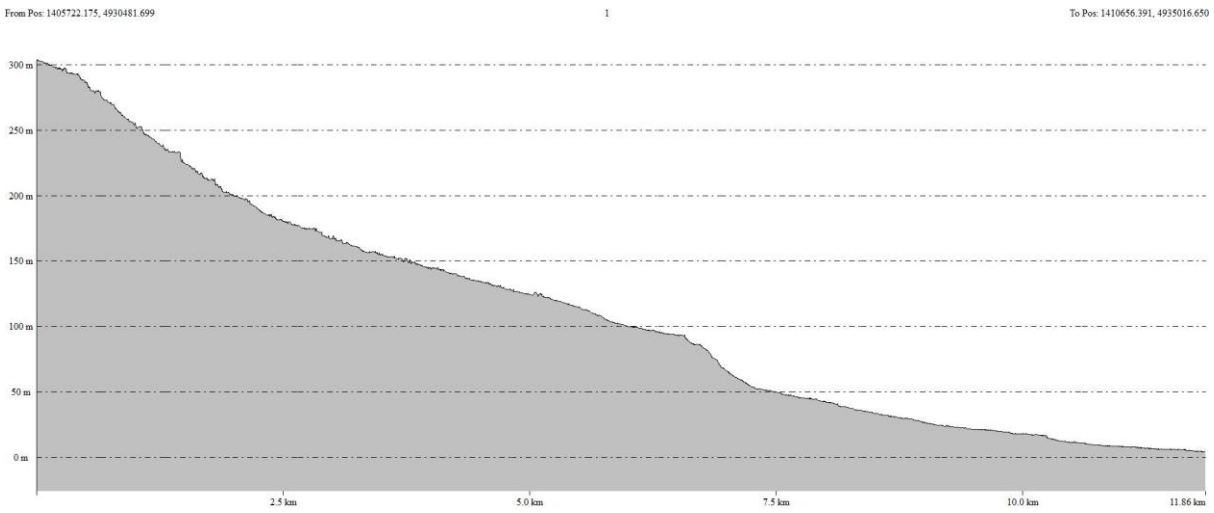


Figure 39. Careys Creek elevation profile (with 1.6km of new track at the top)

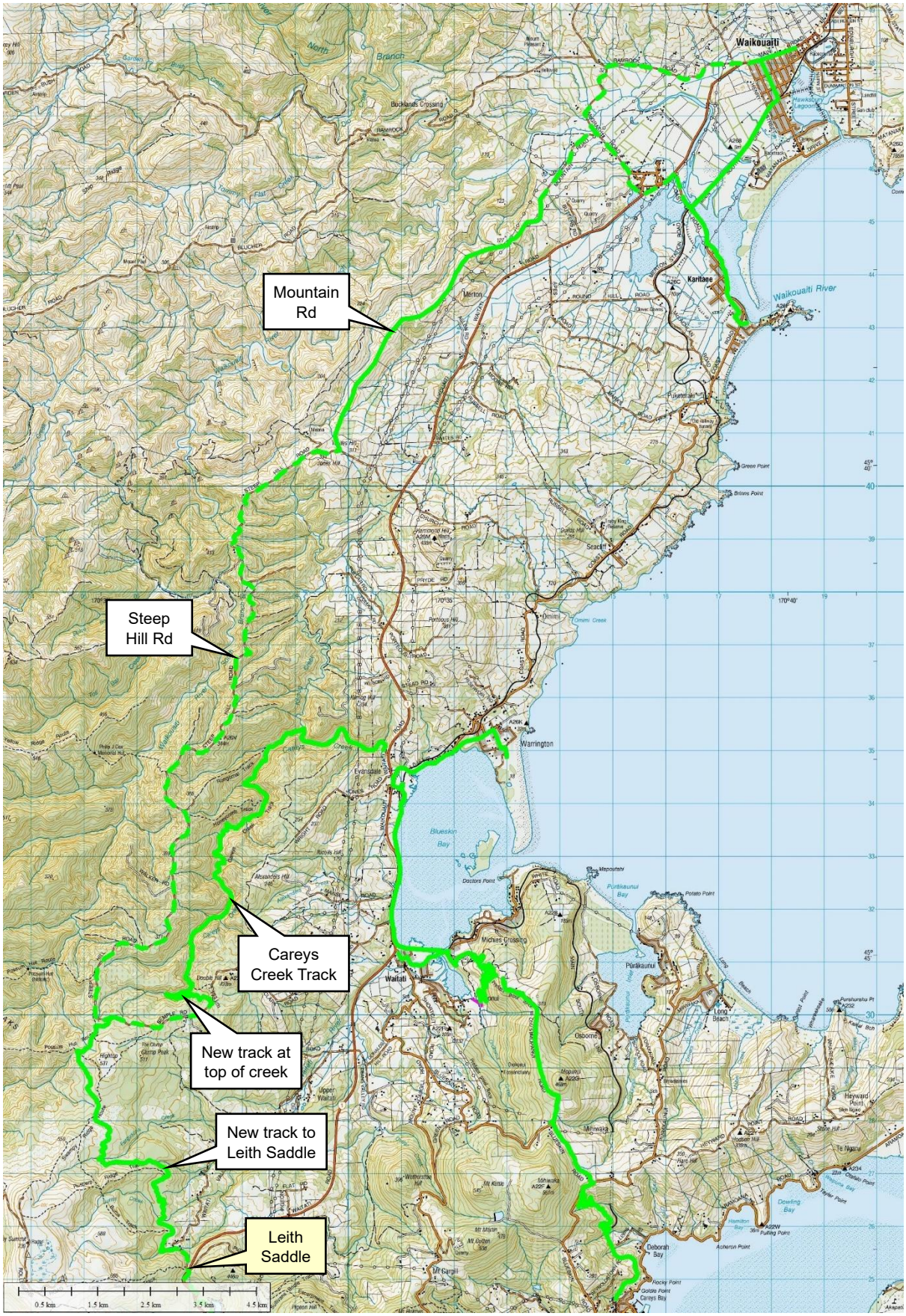


Figure 40. Careys Creek and Mountain Rd options. Off-road trail is shown by solid lines. On-road trail is shown by dashed lines

7.5.2.4 Waikouaiti via Steep Hill Rd / Mountain Rd

The route following the ridge north is known as the 'Old Mountain Rd'. This is an old bullock track that initially connected Waikouaiti to Dunedin, so it has a rich history. The ridge goes through City Forest property, through a locked gate (no public vehicles) and gradually descends to farmland. After 4.4km Mountain Rd branches to the left and continues down the ridge. It finishes on McGrath Rd, from which people can turn right to Karitāne, or left to Waikouaiti. Steep Hill Rd is a gravel road, so ideally suited to gravel riders. Much of Mountain Rd is unformed, and only sees intermittent use by farm vehicles. Being mostly dirt and grass it would be more challenging to use in the wintertime, so parts of the track may need to be upgraded. Most of Mountain Rd runs along a farm boundary, so sections of the track may require fencing.

As it stands, 83% of the existing track falls within the Grade3 specification, and 98% within Grade4. Some of the steeper pitches of track could be eased via small detours through private property.

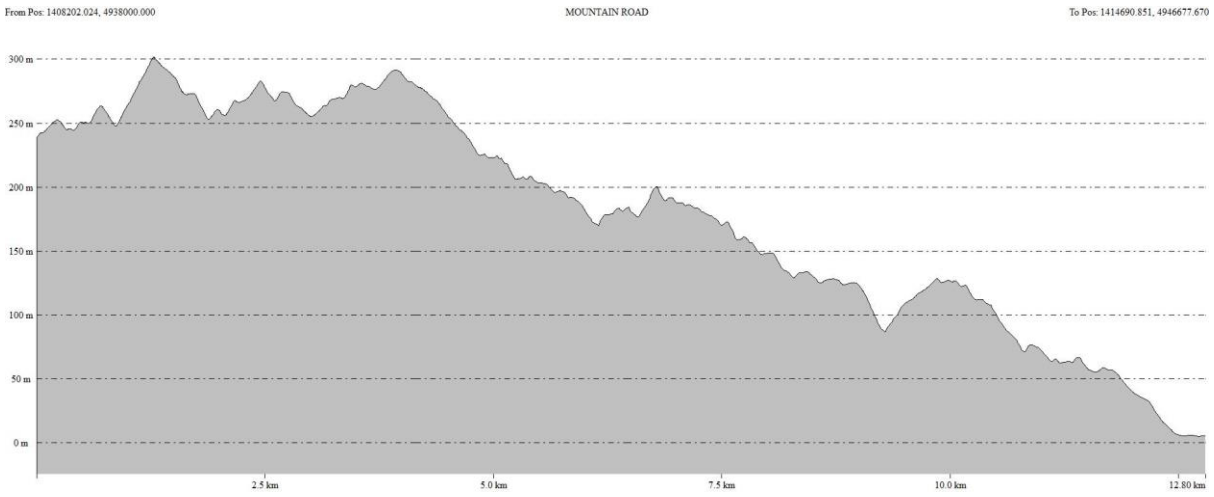


Figure 41. Steep Hill Rd / Mountain Rd elevation profile

The current route between Hightop and Dunedin is the Swampy Ridge track which runs up onto Swampy Summit. This is predominantly a walking track but it is used by intermediate / advanced level mountain bikers. With an elevation of 729m, Swampy Summit is considerably higher than Hightop and Leith Saddle, so it is more likely to appeal to more advanced recreational riders.

7.5.2.5 via Rollinsons Rd

Rollinsons Rd runs up the western side of Swampy Summit from Whare Flat Rd. It's a steep gravel road which is not accessible by public vehicles. At the top of the road the Swampy Spur track heads north and runs through to the Silver Peaks. It also links to Steep Hill Rd. This is a narrow but rideable Grade3 - Grade4 track which can get muddy at times. This track is suitable for low levels of use, but it would need to be made more sustainable if it was to be used by large numbers of riders and walkers.

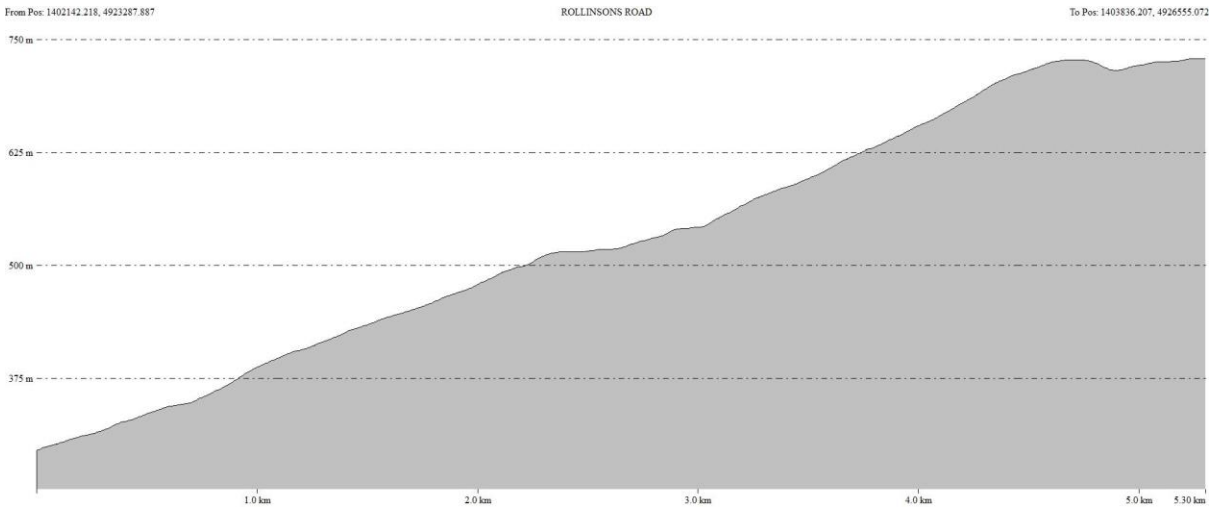


Figure 42. Rollinsons Rd to Swampy Spur track elevation profile

7.5.2.6 via Swampy Ridge

A popular riding and running route starts at the Bullring on Whare Flat Rd and heads up along Swampy Ridge to Swampy Summit. This is a steep and in places rough 4WD track, so it is currently mostly used by walkers. The steeper section of the track may one day be bypassed by an easier-graded trail linking to Nicols Creek as part of the 3 Peaks Trail proposal.

7.5.2.7 via Nicols Creek

The Grade3 Switchback Track at Nicols Creek provides a relatively easy way for riders to get up onto Swampy Ridge. This is popular with runners and riders.

7.5.2.8 via the Pineapple Track

The Pineapple Track is one of the more popular walking tracks (no bikes are permitted). It is very steep.

7.6 Route Comparison

The tables below summarise the route options heading north from Dunedin to Waitati via Blueskin Rd, and existing roads that might be used to link Dunedin to the north via Leith Saddle.

Direction	From	Road	Length	Lowest	Highest	Climb	Descent	Grade2	Grade3	Grade4
Uphill	Port Chalmers	Blueskin Rd	5km	4m	285m	281m	27m	72%	91%	99%
Uphill	Blueskin Rd	Heyward Point Rd	6.1km	195m	329m	160m	246m	70%	90%	98%
Downhill	Blueskin Rd	Mopanui Rd	6.1km	16m	376m	89m	404m	57%	75%	88%
Downhill	Blueskin Rd	Orokonui fence line (east)	3.2km	235m	372m	71m	161m	71%	84%	94%
Downhill	Mopanui Rd	Orokonui fence line (west)	2.8km	157m	322m	39m	200m	67%	76%	78%
Downhill	Mopanui Rd	Blueskin Rd - Shortcut Rd	5.4km	11m	332m	4m	325m	74%	88%	100%

Table 3. Summary of roads heading north from Dunedin to Waitati via Blueskin Rd.

Direction	From	Road	Length	Lowest	Highest	Climb	Descent	Grade2	Grade3	Grade4
Uphill	Dunedin City	Leith Valley Rd	8km	38m	366m	362m	35m	94%	98%	99%
Uphill	Dunedin City	Northern Motorway	8km	25m	366m	362m	23m	92%	100%	100%
Uphill	Whare Flat	Rollinsons Rd	5.3km	295m	729m	447m	12m	52%	80%	99%
Downhill	Leith Saddle	Waitati Valley Rd	7.3km	29m	366m	29m	356m	96%	99%	100%
Downhill	Leith Saddle	Northern Motorway	8km	11m	366m	47m	402m	92%	100%	100%
Downhill	Steep Hill Rd	Semple Rd/Double Hill Rd	6.7km	3m	421m	64m	482m	59%	77%	92%
Downhill	Steep Hill Rd	Steep Hill/Mountain Rd	12.8km	5m	301m	313m	546m	71%	85%	98%
Downhill	Semple Rd	Careys Creek track	11.9km	3m	320m	13m	377m	90%	97%	98%
Traverse	Leith Saddle	Track to Steep Hill Rd	7.5km	366m	463m	104m	48m	100%		

Table 4. Summary of roads heading north from Dunedin via Leith Saddle.

Note: The Steep Hill options and the Careys Creek track would be accessed from Leith Saddle by a 7.5km trail (3km following the Pipeline track and 4.5km of new track). The Careys Creek option includes 1.6km of new track at the top of the valley to ease the grade from Semple Rd.

If a completely off-road commuting trail is to be constructed from Waitati to Dunedin, the only viable route is from to Port Chalmers via the Orokonui Ecosanctuary. All other options would be partially on-road. The Orokonui route would:

- Have the least amount of climbing (281m).
- Be the shortest ride or walk and be cheapest to construct.
- Offer an excellent rider experience as it would be away from roads and mostly through native bush.
- Would be mostly on public land.
- Would have services (water, food and toilets) at both ends, as well as in the middle at the Ecosanctuary.
- Can be built to a Grade2 standard, so would be useable by most cyclists. This would also make it safer for 2-way traffic and more sustainable.
- It would complement the existing on-road route via Leith Valley and Waitati Valley Rd, making a Grade2 loop ride possible.

Routes via Leith Saddle or Swampy Summit would appeal to more advanced riders due to being partially on-road and requiring a greater amount of climbing.

- A new trail from Leith Saddle to Steep Hill Rd would enable alternative routes between each of the coastal communities (Waikouaiti/Karitāne, Evansdale/Warrington and Waitati) and Dunedin. These would suit intermediate level riders, or gravel riders.
- The Careys Creek track could be upgraded and extended to enable shared use. It would provide more of a single-track experience, which would make a good loop with the proposed trail between Waitati and Dunedin.
- The existing track between Swampy Summit and Steep Hill Rd could be tidied up or upgraded to make it a more useable and sustainable part of the network. It would more likely appeal to intermediate / advanced riders.

Recommendations:

Develop an off-road Grade2 trail from Port Chalmers to Waitati via Orokonui Ecosanctuary

Build a new track from Leith Saddle to Steep Hill Rd to provide additional links between the northern coastal communities and Dunedin.

Consider upgrade signage and fencing to formalise the Mountain Rd route.

Consider upgrading the Careys Creek track.

8. Connecting Dunedin to the NZCT network

A trail connecting the Coastal Communities to Dunedin could potentially form part of the NZCT trail network. There are 6 NZCT “Great Rides” either in, or partially in the Otago region.

- Alps 2 Ocean Cycle Trail
- Around the Mountain Trail
- Clutha Gold
- Otago Central Rail Trail
- Queenstown Trail
- Roxburgh Gorge

None of these off-road trails extend all the way to Dunedin. If trail users want to start or finish their ride in Dunedin, they need to either ride on the road or take an alternative mode of transport.

An off-road trail between Dunedin and Waihola is currently being developed. This is made up of two projects:

- The Dunedin Tunnels Trail, overseen by the Dunedin Tunnels Trail Trust (DTTT)
- The Mosgiel to Waihola Trail, overseen by the Dunedin Tracks Network Trust (DTNT)

When these trails are complete, Dunedin will be linked to the Queenstown and Central Otago trails networks. There is also the potential to develop a trail from Outram to Hindon, which could then link to the Otago Central Rail trail at Middlemarch. This would close the gaps in the NZCT trail network to the south and the west of Dunedin.

The Waitaki District Council have expressed an interest in building a trail from Oamaru to Dunedin. This would link Dunedin to the NZCT network to the north (the Alps 2 Ocean Cycle Trail). The WDC has investigated developing a trail to Kakanui,14km south of Oamaru. If a trail was developed from Waikouaiti to Dunedin, it would only take another 60km of trail to link all of the Great Rides in the southern part of New Zealand together.

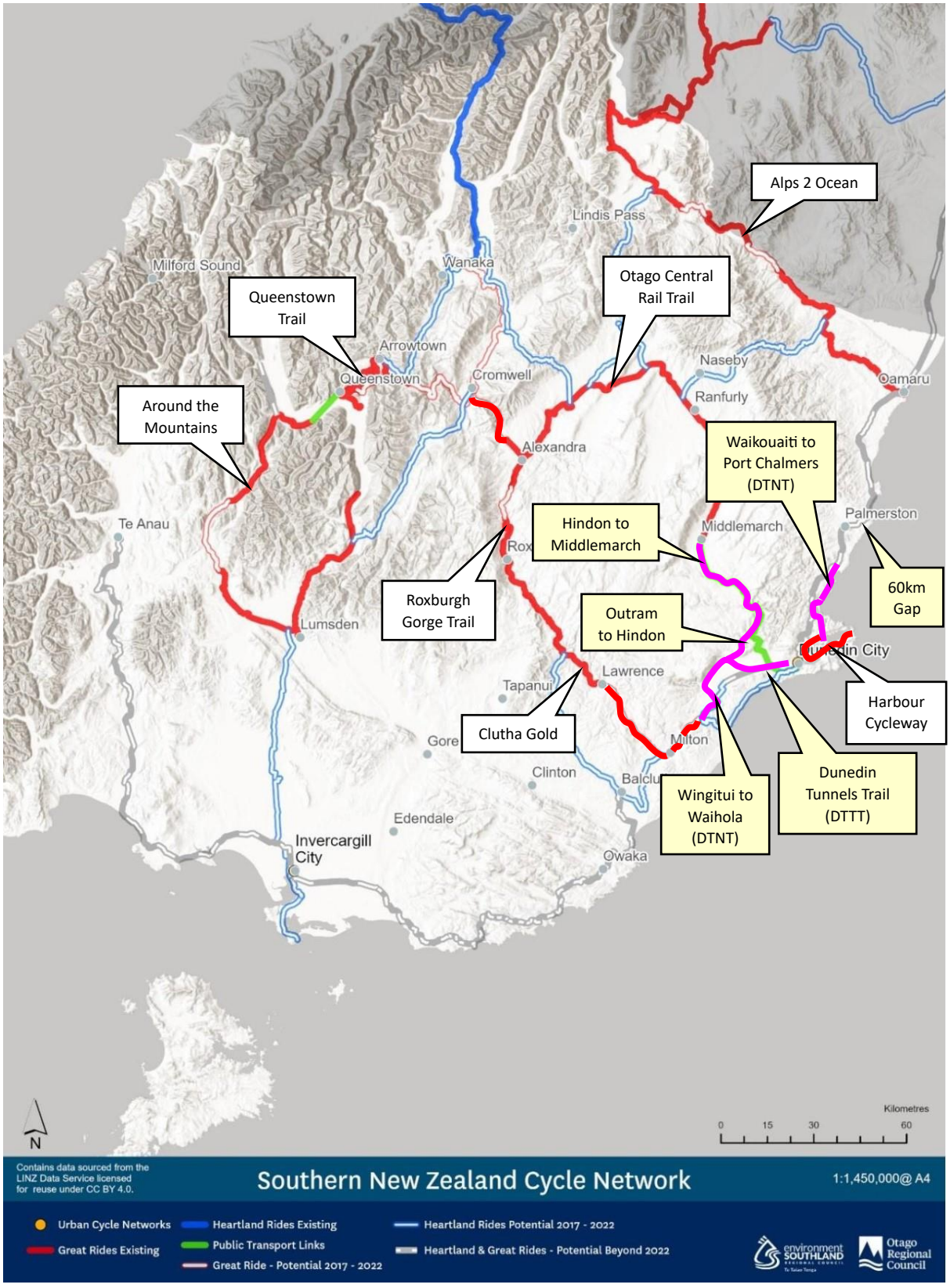


Figure 43. Potential additions to the Southern NZ cycle network. [Otago Southland Regional Land Transport Plan 2021-2031]

9. Consultation

In addition to the public meetings and workshops, extensive consultation has been undertaken over the last 12 months.

9.1 Community Consultation

All major landowners along the recommended routes have been spoken. Landowner support is overwhelmingly positive and encouraging. Several adjustments have been made to the routes following their feedback.

The Orokonui Ecosanctuary Limited board and their parent body the Otago Natural History Trust were also consulted. Although routing the cycleway through the ecosanctuary was not something either board supported, they do remain interested and supportive of the project in principal (if it took another route) and could see potential benefits for the community and for Orokonui of having a local cycleway initiative.

9.2 Rùnanga

Consultation has been made throughout the route exploration process with Kāti Huirapa Rūnaka ki Puketeraki and the East Otago Taiapure Management Committee.

9.3 KiwiRail

Approval in Principle has been obtained for the trail from Waikouaiti to Karitāne and the trail from Evansdale to Waitati. An application hasn't yet been submitted for the track from Port Chalmers.

9.4 Dunedin City Council

The use of DCC leasehold property has been discussed and meetings held with DCC staff and the Lessees.

9.5 Department of Conservation

The use of PCL has been discussed informally with local DOC staff. All areas of interest already have tracks through them. The Silverpeaks Scenic Reserve has been added to table 2.7 of the Otago CMS partial review, allowing the construction of shared-use tracks to be considered.

10. Consenting Requirements

10.1 Local Council Consents

Local councils are responsible for earthworks and building consents. The Dunedin City Council (DCC) covers the area from Dunedin City to just north of Waikouaiti, so all of the trail will be built in the DCC region.

NOTE: The comments below are general observations based on similar projects. The trail proposal should be discussed in detail with the Duty Planners at the relevant council. If necessary, a Planning Consultant can be engaged to provide advice prior to consent applications being submitted.

10.1.1 Earthworks Consents

Section 8A of the 2GP sets out the Objectives, Policies and Rules for earthworks.

If earthworks meet the definition of "Earthworks – small scale", then they are a Permitted Activity and a consent is not required.

Rule 8A.5.1 determines the thresholds for small scale earthworks.

Rule 8A.5.1.1 lists earthworks that are always considered *earthworks - small scale*.

Part (g) lists:

earthworks for the erection of new fences or the construction of walking tracks or vehicle tracks, where the fence or track is associated with a permitted land use or city-wide activity, provided that the earthworks:

- *do not result in a change in finished ground level that exceeds 1m; and*
- *do not exceed 2m in width if located in an ASBV or ONF, ONCC, HNCC or NCC overlay zone, or 3m in width outside these areas.*

10.1.1.1 DCC 2GP Rural Overlay

A 2.2m wide walking and cycling track should be a permitted activity, subject to the maximum change in finished ground level. The permitted limit is 2m in Rural areas, 1.5m in Recreation or Residential areas, 1m in several mapped areas.

- The new section of the Waikouaiti to Karitāne trail between Henry St to Karitāne (Ch1770-Ch4930) is through Rural Zoned land.
- The trail from Warrington to Evansdale is on road reserve and already formed.
- The portions of the trail from Evansdale to Waitati that are on land, will be on rural zoned land.
- All of the trail from Waitati to Port Chalmers will be through Rural zoned land.
- The trail from Leith Saddle to Steep Hill Rd would be through Rural zoned land.

Within 20m of a water body the maximum unconsented change of ground level is 0.5m. This will be trigged when filling beside the bays.

Rule 8A.5.3 specifies that a cut batter shall be no steeper then h1:1v and a fill batter no steeper than 2h:1v. The trail can be built to these specifications.

NOTE: If trail maintenance activities are likely to require a consent (eg non permitted earthworks), then a consent for ongoing maintenance should be obtained.

10.1.1.2 DCC 2GP Hazard Overlay

- The Waikouaiti to Karitāne trail from the poultry farm to Karitāne (Ch2830-Ch5000) is through the Coastal Hazard zone.
- The trail from Warrington to Evansdale is on road reserve and already formed. A short section of the road north of Evansdale is captured by the Coastal Hazard Zone.
- All of the trail from Evansdale to Waitati is captured by the Coastal Hazard Zone.

10.1.1.3 DCC 2GP Significant Natural Landscape Overlay

The type of landscape that the trail passes through can trigger planning rules.

- None of the Waikouaiti to Karitāne trail would be through Significant or Outstanding Natural areas.
- None of the trail from Warrington to Evansdale trail would be through Significant or Outstanding Natural areas.
- None of the trail from Evansdale to Waitati trail would be through Significant or Outstanding Natural areas.
- Most of the new trail from Waitati to Orokonui will be through Outstanding Natural Landscape, though almost all of the trail will be on the existing boundary track or beside Mopanui Rd.
- The portion of the trail above the railway from Port Chalmers will also be through Outstanding Natural Landscape, and the section alongside the railway will be through Significant Natural Landscape.
- The trail from Leith Saddle to Steep Hill Rd would be through Significant Natural Landscape.

10.1.1.3 DCC 2GP Wahi Tupuna Overlay

"Wahi tupuna" zones were introduced as part of Dunedin's second generation district plan (2GP). These cover landscapes that embody the ancestral, spiritual and religious traditions of all the generations before European settlement. In Dunedin these don't automatically trigger a consent, but discretionary or non-complying activities could be required to consider the area's wahi tupuna values as part of a wider assessment of effects.

The trail passes through several areas of Wahi Tupuna:

- Purakaunui to Hikaroroa to Huriawa
- Te Tauraka Poti (Merton Tidal Arm)
- Okahau (Warrington)
- Blueskin Bay
- Views from Otakou Marae around Upper Harbour

These areas should be discussed with Rùnanga.

- Most of the new section of the Waikouaiti to Karitāne trail would be through the Wahi Tupuna area.
- All of the trail from Warrington to Evansdale is through the Wahi Tupuna area.
- All of the trail from Evansdale to Waitati is through the Wahi Tupuna area.
- A small section of the trail from Waitati to Port Chalmers east of Mihiwaka is through the Wahi Tupuna area.

- The trail portion of the Leith Saddle track past trail past Hightop would be through the Wahi Tupuna area.

10.1.1.3 DCC 2GP Archaeological Overlay

- Most of the new section of the Waikouaiti to Karitāne trail around Karitāne would be through the Archaeological Alert area.
- Most of the trail from Warrington to Evansdale is through the Archaeological Alert area, but the trail is already formed.
- Most of the trail from Evansdale to Waitati is through the Archaeological Alert area.
- Small parts of the trail from Waitati to Port Chalmers are through the Archaeological Alert area.

10.1.2 Building Consents

Building consents will be required for bridges or structures where the fall height is >1.5m. This is likely to be the case for most bridges more than 5m long. Generally, it is more practical to use the Producer Statement system so work can be signed off by independent licenced professionals. This removes reliance on DCC building inspectors.

10.2 Regional Council Consents

Resource consents are issued under the Resource Management Act 1991 and help ensure that any effect on the environment is managed sustainably. Two consents will typically be required from the ORC to install a bridge; a land use consent to erect the structure and disturb the bed, and a discharge permit to discharge contaminants (eg sediments). However, if works instream are minimal, a discharge permit may not be required. Sometimes a consent to divert water may be needed.

NOTE: If trail maintenance activities are likely to require a consent (eg non permitted earthworks), then a consent for ongoing maintenance should be obtained at the same time as the consent for trail construction.

10.2.1 Bridge Rules

Rule 13.2.1 lists permitted activities where no resource consent is required. Rule 13.2.1.7 sets out the rules around bridge construction. Bridges longer than 20m will require a consent.

The erection or placement of any single span bridge including for pipes over the bed of a lake or river, or any Regionally Significant Wetland, is a permitted activity, providing:

(a) The bridge or its erection or placement, does not cause any flooding, nor cause any erosion of the bed or banks of the lake or river, or Regionally Significant Wetland, or property damage; and
(b) No more than 20 metres of bridge occurs on any 250 metre stretch of any lake or river; and
(c) There is no reduction in the flood conveyance of the lake, river or Regionally Significant Wetland; and
(d) The bridge soffit is no lower than the top of the higher river bank; and
(e) The bridge and its abutments are secured against bed erosion, flood water and debris loading; and
(f) Where the bridge is intended for use by stock, measures are taken to avoid animal waste entering the lake, river or Regionally Significant Wetland; and
(g) *If the bridge is situated over or on public land, then public access over the public land is maintained.*

11. Potential Funding Sources

There are many potential sources of funding.

11.1 Central Government

A large proportion of NZ cycle trail funding has come from Central Government.

11.1.1 Ministry of Business Innovation and Employment

The New Zealand Cycle Trails (NZCT) are funded by MBIE. NZCT supports a network of 23 Great Rides and Heartland/Connector Rides, including the Alps 2 Ocean trail that terminates at Oamaru. The proposed trail from Waikouaiti to Dunedin could become part of the NZCT network linking Dunedin to Oamaru. As such, there would be a good case for pursuing NZCT funding. Generally, NZCT only provide 50% funding towards projects. They also have funds to assist with trail management, maintenance, and repairs after major events.

11.1.2 Government Funds

Several trails have received a large proportion of their funding from the Provincial Growth Fund. This was a $3B fund set up in 2018 to invest in the economies of our regions. This fund is no longer active, but future governments may choose to create similar funds eg. The Covid Response and Recovery Fund.

11.1.3 Department of Internal Affairs

The Department of Internal Affairs (DIA) administers several funds that support the development of community facilities, including the Lotteries Community grants.

11.1.4 Waka Kotahi / NZ Transport Agency

WK/NZTA manage and maintain the state highway network. If a trail is likely to take cyclists off the highway network, then WK/NZTA may be able to assist with funding via National Land Transport Fund (NLTF), or through minor Safety Improvement programs. This year's fund is fully subscribed, and they are currently putting together the long list for next year's program, which is due in July 2024. WK/NZTA budgeted to spend $18,264,686 on walking and cycling in the Otago region over the 2018-2021 period.

11.2 Dunedin City Council

Most local councils invest in cycle trail initiatives. Councils are often one of the primary stakeholders when trails are developed, and they often become the owner and maintainer of trails once they have been built. To gain DCC funding the project would need to be endorsed by the Council and budget would need to be allocated as part of the 10-year plan process.

The DCC can apply for funds from the NLTF. They are currently receiving $8,405,000 over 2021-2024 period for walking and cycling facilities. We were pleased to be involved in the DCC workshop held by the Transport Strategy team in March, reviewing our city's strategic walking and cycling routes with the goal of developing a walking and cycling master plan for the next 10 years. This master plan will identify what has changed and where our main walking and cycling routes should be. This will help the council put together a programme of works to improve the safety of those routes and offer broader transport choices across the city. The Coastal Connection proposed routes will be included in this masterplan.

11.3 Otago Regional Council

The ORC is responsible for the Regional Land Transport Plan (RLTP). This is a six-year plan that document the regions' land transport objectives, policies, and measures, as well as providing a statement of transport priorities for the region. Cycling is identified as part of an integrated transport network that provides a viable alternative to driving a car. The RLTP notes that gaps remain in the regional cycle network, namely Dunedin to Oamaru.

Cycle and walking tracks also provide connections to public transport services, and they are mentioned in the Regional Public Transport Plan (RPTP), which sets out objectives and policies for delivering public transport in Dunedin and the wider Otago Region.

11.4 Charitable Trusts

There are a number of locally based and nationally based charitable trusts, primarily distributing gaming funds. Many cycle trails use charitable trust funding to fulfil the 50% local funding share when applying for government grants.

11.5 Corporate Sponsors

Local and national companies are another source of funding. Items that can be named (such as bridges) are particularly suited to corporate sponsorship.

11.6 Public Sponsors

Public fund-raising drives can assist financially, and they are also a great way of raising awareness of the trail and engaging with the public.

12. Next Steps

The steps below list some of the tasks that will need to be undertaken to progress with the trail development once preferred route is defined.

- Landowner Consultation – further discussions to ensure that the preferred route is buildable, and to then secure agreements to grant easements.
- Public Consultation – to get additional feedback on the preferred route.
- Iwi Consultation – to obtain a formal response to the proposal.
- ORC Consultation – discuss trail and bridges close to waterways, to adopt the plan into the Regional Public Transport plan, to investigate funding opportunities, and to better understand consenting requirements.
- DCC Consultation - to get DCC Transportation to formally consider the proposal, discuss options for trails through the local communities using existing gravel paths in places, to investigate funding opportunities, and to better understand consenting requirements.
- WK/NZTA – to approve the use of state highway road reserve, and ultimately grant a licence to occupy.
- Fundraising for consenting, approvals and design work
- KiwiRail – to gain an Approval in Principle for the route along the railway north of Port Chalmers, then to go through the KiwiRail approval process for all trail beside the railway (likely to take 12 months). Undertake a LCSIA for all public rail crossings impacted by the trail (Waikouaiti, Coast Rd).

- Bridge options – get advice around the feasibility for the large suspension bridges or clip-on bridges, prepare preliminary designs, then liaise with the relevant authorities / bridge owners . Ultimately prepare developed designs that can be submitted for KiwiRail approval, consent and tendering.
- Review cost estimates to reflect design changes and cost inflation.
- Assessment of Environmental Effects – prepare an AEE for the trail, which will be required for the consent process. This may require input from an Ecologist and/or an Archaeologist.
- Prepare and submit Consent applications to DCC and ORC.
- Review trail alignment over winter to identify issues around water, roads, stock.
- Prepare construction plans and construction notes.
- Fundraising for construction.
- Tender the trail construction and bridge construction.

Appendix 1. KiwiRail approval in principle for Waikouaiti to Karitāne

28 October 2022

Dunedin City Council
PO Box 5243
Dunedin

Attn: **Emily Cooper**

Dear Emily,

Reference: **L68688 – Shared Pathway Application Stage 1 for Dunedin City Council**

KiwiRail has reviewed your Shared Pathway application and approves, in principle, the use of the rail corridor for Dunedin City Council in the following location: from **330.400km to approximately 333.100km on the Main South Line.**

WHAT DOES IT MEAN

It means that the land you have identified in your application can be utilised as a Shared Pathway provided that the detailed design, drawings and construction addresses the general and specific matters and satisfies KiwiRail's requirements.

If there will be other unforeseen issues that may arise during the design or construction phases, KiwiRail will work constructively with Council to resolve such issues.

This approval does not in itself confer agreement to the detailed design, a License to Occupy, a grant agreement or a Permit to Enter.

STAGE TWO

If you would like to proceed to Stage 2, please submit the detailed designs and drawings. I have enclosed here KiwiRail specifications on Shared Pathways for your reference.

You will also need to send an itemised list of assets that may be installed on rail land – template is also enclosed here.

When we receive the documents from you for Stage 2, a KiwiRail project manager will work closely with you to obtain the necessary approvals. Once approved, the license agreement and grant agreements will be prepared for execution by Dunedin City Council and KiwiRail.

Please refer to the enclosed Frequently Asked Questions for Shared Pathway for information on grants and licenses.

OTHER INFORMATION

Please see below general matters that we would like to be addressed during the detailed design and construction of the pathway:

- If there is a 4m clearance from the track, you will need to complete a departure form from the track standard for public pathways.

- KiwiRail's track standard T-ST-DE-5215 Public Pathways on the Rail Corridor will be met including for example a 1.2m to 1.8m fence in all locations and where the pathway is within 10m of the centerline of the track unless there is topography, other land features or foliage that would make it difficult for people to access the rail itself.

- When there is an existing farm or other fence at 4m, in general a new fence will be required at the desirable setback at 6m - 7m if possible, 5m if not. There may be situations where the fence is in good condition and there is either topography or foliage creating an effective setback that is more than 5m. This can be determined during detailed design on a case-by-case basis.

- A design report that explains how the pathway will meet the track standard and other relevant KiwiRail engineering standards, and that describes how KiwiRail staff would inspect and maintain its assets in the rail corridor with the Trail in place.

DETAILED DESIGN

KiwiRail would like to review detailed design drawings at 50%, 85% and will need to approve 100% detailed design before a License to Occupy, Grant Agreement or associated Permit to Enter can be issued. Please note that each review of detailed design drawings can take at least 60 days to complete. It can take longer to manage the iteration of comments and resubmission of drawings.

NEXT STEPS

When Dunedin City Council is ready for KiwiRail to review design drawings, a KiwiRail project manager will be in touch with you.

Prior to any construction works, a Permit to Enter will be required, in addition to all agreements such as grants and licenses or leases.

We look forward to working with Dunedin City Council on the design and construction of the Shared Pathway at Beach Street

Yours sincerely

Luis Miguel Enriquez
Grants Specialist
Mobile: 027 3732913 Email address: grants@kiwirail.co.nz


Proposed walking and cycling trail to Waikouaiti
Proposed walking and cycling trail on KiwiRail property
Proposed walking and cycling trail to Karitane
HENRY
STREET
LINE
SOUTH
MAIN
COAST
ROAD
STATION ROAD
A268
9m
Racetrack
Camp
DRIVE
TANAKA
DUNEDIN TRACKS NETWORK TRUST
WAIKOUAITI TO KARITANE TRAIL
DRAFT ROUTE - TOPOMAP
2022-06-26

Appendix 2. KiwiRail approval in principle for Evansdale to Waitati

3 March 2023

Dunedin City Council
PO Box 5243
Dunedin

Attn: **Emily Cooper**

Dear Emily,

Reference: **L68690 – Shared Pathway Application Stage 1 for Dunedin City Council**

KiwiRail has reviewed your Shared Pathway application and approves, in principle, the use of the rail corridor for Dunedin City Council in the following location: **347.143 km to approximately 353.137 km Main South Line at Evansdale**

WHAT DOES IT MEAN

It means that the land you have identified in your application can be utilised as a Shared Pathway provided that the detailed design, drawings and construction addresses the general and specific matters and satisfies KiwiRail's requirements.

If there will be other unforeseen issues that may arise during the design or construction phases, KiwiRail will work constructively with Council to resolve such issues.

This approval does not in itself confer agreement to the detailed design, a License to Occupy, a grant agreement or a Permit to Enter.

STAGE TWO

If you would like to proceed to Stage 2, please submit the detailed designs and drawings. I have enclosed here KiwiRail specifications on Shared Pathways for your reference.

You will also need to send an itemised list of assets that may be installed on rail land – template is also enclosed here.

When we receive the documents from you for Stage 2, a KiwiRail project manager will work closely with you to obtain the necessary approvals. Once approved, the license agreement and grant agreements will be prepared for execution by Dunedin City Council and KiwiRail.

Please refer to the enclosed Frequently Asked Questions for Shared Pathway for information on grants and licenses.

OTHER INFORMATION

Please see below general matters that we would like to be addressed during the detailed design and construction of the pathway:

- If there is a 4m clearance from the track, you will need to complete a departure form from the track standard for public pathways.

- KiwiRail's track standard T-ST-DE-5215 Public Pathways on the Rail Corridor will be met including for example a 1.2m to 1.8m fence in all locations and where the pathway is within 10m of the centerline of the track unless there is topography, other land features or foliage that would make it difficult for people to access the rail itself.

- When there is an existing farm or other fence at 4m, in general a new fence will be required at the desirable setback at 6m - 7m if possible, 5m if not. There may be situations where the fence is in good condition and there is either topography or foliage creating an effective setback that is more than 5m. This can be determined during detailed design on a case-by-case basis.

- A design report that explains how the pathway will meet the track standard and other relevant KiwiRail engineering standards, and that describes how KiwiRail staff would inspect and maintain its assets in the rail corridor with the Trail in place.

DETAILED DESIGN

KiwiRail would like to review detailed design drawings at 50%, 85% and will need to approve 100% detailed design before a License to Occupy, Grant Agreement or associated Permit to Enter can be issued. Please note that each review of detailed design drawings can take at least 60 days to complete. It can take longer to manage the iteration of comments and resubmission of drawings.

NEXT STEPS

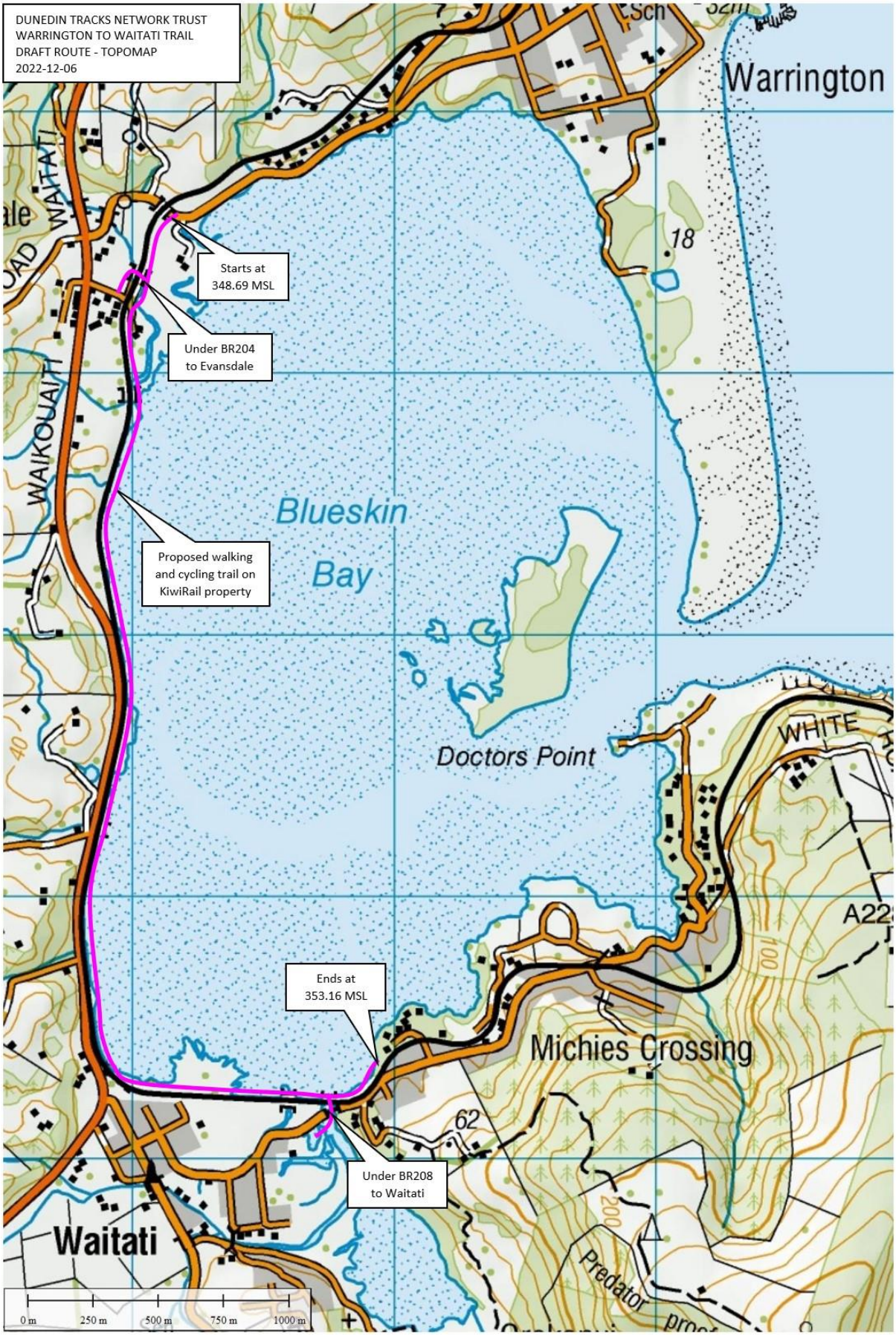
When Dunedin City Council is ready for KiwiRail to review design drawings, a KiwiRail project manager will be in touch with you.

Prior to any construction works, a Permit to Enter will be required, in addition to all agreements such as grants and licenses or leases.

We look forward to working with Dunedin City Council on the design and construction of the Shared Pathway at Beach Street

Yours sincerely,

Luis Miguel Enriquez
Grants Specialist
Mobile: 027 3732913 Email address: grants@kiwirail.co.nz


DUNEDIN TRACKS NETWORK TRUST
WARRINGTON TO WAITATI TRAIL
DRAFT ROUTE - TOPOMAP
2022-12-06
Warrington
Starts at
348.69 MSL
Under BR204
to Evansdale
WAIKOUAITI
Blueskin
Bay
Proposed walking
and cycling trail on
KiwiRail property
Doctors Point
WHITE
Ends at
353.16 MSL
Michies Crossing
Under BR208
to Waitati
Waitati
Predator
0 m
250 m
500 m
750 m
1000 m

Appendix 3. Short report on Waitati-Warrington upper shore biota

Waitati–Warrington proposed cycleway: initial appraisal of the upper shore biota

One route option for a proposed cycleway between Waitati and Warrington would, for much of its length, skirt the western margin of Waitati Inlet. This option would entail infilling alongside the railway to provide a cycleway 2-5–3.0 m wide plus a further 1–2 m for rock armouring of the track, construction that could encroach onto the upper margin of the shore.

To provide an initial appraisal of the shore biota that might be impacted by cycleway construction, I walked along the upper margin of the shore from Careys Creek to the south-west corner of the inlet, opposite On The Spot Waitati (on 1 October from 10:35 to 11:45 am between Careys Creek and ~ 45.730°S, 170.570°E, and on 3 October from 11:35 am to 12:30 pm between ~ 45.730°S, 170.570°E and the south-west corner of the inlet). I did not visit the southern margin of the inlet as the proposed route along this stretch would appear to require minimal infilling of the upper shore. I noted only conspicuous organisms on the surface of the shore and distinctive sedimentary features characteristic of subsurface animals (notably crab burrow openings and polychaete worm casts). This site visit was intended to provide only a cursory, qualitative appraisal of the shore biota.

The upper margin of the shore along the proposed route consists mostly of dumped rock and railway ballast giving way to the soft sediment of the inlet flats – muddy fine sand to sandy mud. Conspicuous along the rocky margin was the estuarine barnacle (*Austrominius modestus*). Also recorded were the horn snail (*Zeacumantus subcarinatus*), estuarine limpet (*Notoacmea scapha*) and (among the cobbles/ballast) sandhoppers (talitrid amphipods). In addition, moss weed (*Bostrychia arbuscula*), blue tubeworm (*Spirobranchus cariniferus*), spotted black top shell (*Diloma aethiops*) ornate limpet (*Cellana ornata*) and purple rock crab (*Hemigrapsus sexdentatus*) were noted in the middle stretch where the main channel comes close to the inlet's western margin.

Conspicuous animals of the adjacent soft sediment were the mud snail (*Amphibola crenata*), mudflat top shell (*Diloma subrostratum*), ribbed top shell (*Micrelenchus tenebrosus*), horn snail (*Zeacumantus subcarinatus*), stalk-eyed mud crab (*Hemiplax hirtipes*), and lugworm (*Abarenicola affinis*) and bamboo worm (*Macroclymenella stewartensis*) (both identified by their distinctive surface casts). The mud whelk (*Cominella glandiformis*) and wedge clam (*Macomona liliana*) (distinctive siphon marks on the sediment surface) were noted in the middle stretch opposite the western channel (as above). The tunnelling mud crab (*Austrohelice crassa*) occurred in drier (not waterlogged) areas of sediment at the top of the shore. Also at the top of the shore, just south of Careys Creek, were patches of saltmarsh plants, notably sea primrose (*Samolus repens*) and glasswort (*Sarcocornia quinqueflora*), and a small patch of the introduced cord grass (*Spartina anglica*). Mats of sea lettuce (*Ulva* sp.) were conspicuous along the shore, from bleached deposits at extreme high tide to fresh mats of the alga on the sediment surface (particularly in the south-western sector).

The organisms noted here are typical of those commonly recorded from sheltered inlets of southern New Zealand (e.g. Johnson et al. 2003; Probert 2003; Rowden et al. 2012). However, this represents only a quick appraisal and an environmental impact assessment would be needed if the proposal is adopted.

Johnson, P., Walker, S. and Patrick, B. 2003. Coastal vegetation and invertebrates, pp. 283–291 in *The Natural History of Southern New Zealand*. J. Darby, R.E. Fordyce, A. Mark, K. Probert and C. Townsend (eds). Dunedin: University of Otago Press.

Probert, K. 2003. Inlets and estuaries. pp. 292–295 in *The Natural History of Southern New Zealand*. J. Darby, R.E. Fordyce, A. Mark, K. Probert and C. Townsend (eds). Dunedin: University of Otago Press.

Rowden, A.A., Berkenbusch, K., Brewin, P.E., Dalen, J., Neill, K.F., Nelson, W.A., Oliver, M.D., Probert, P.K., Schwarz, A.-M., Sui, P.H. and Sutherland, D. 2012. A Review of the Marine Soft-Sediment Assemblages of New Zealand. *New Zealand Aquatic Environment and Biodiversity Report* No 96, 165 pp.

P. Keith Probert
4 October 2020

Photos – representative views of the uppermost shore consisting of dumped rock and ballast giving way to soft sediment. (Mud snails (*Amphibola crenata*) are conspicuous on the sediment surface in photos 1and 2, and sediment casts of bamboo worms (*Macroclymenella stewartensis*) evident in photo 4.)

Photo 1

Photo 2

Photo 3

Photo 4

Appendix 4. Kāti Huirapa Runaka ki Puketeraki letter of support

Kāti Huirapa Runaka ki Puketeraki

19-Aug-21

To whom it may concern

Tēnā koe,

I am writing on behalf of Kāti Huirapa Rūnaka ki Puketeraki in support of the efforts of Coast Communities Cycle Connection to investigate the development of a walking & cycle network linking the East Otago coastal communities from Waikouaiti to Waitati.

Karitane is a village that currently depends heavily on vehicles to connect with our neighbouring communities as the roads are generally unsafe for walking or cycling. We think it would greatly benefit the people of Karitane as well as the communities to the north & south to have the use of walking & cycleways. Improved social connection between the communities as well as overall improvements to well-being would be immediate benefits.

We also believe the local economy would benefit from making the beauty & history of our coastal area more accessible to travelers with the establishment of cycle & walkways. This could directly assist our fledgling cultural & environmental tourism business, Karitane Māori Tours, plus other local businesses.

We hope the Lottery Community Facilities Fund is supportive of the application.

Kā mihi

Suzanne Ellison

Suzanne Ellison

Runaka Manager

Puketeraki Marae: 520 Apes Road, Puketeraki. Office: 121 Grimness Street C/0- Post Office, Karitane, 9440,

Phone (03) 465 7300, Email: manager@puketeraki.nz

Appendix 5. Letter of support from Waikouaiti Coast Community Board

WAIKOUAITI COAST
COMMUNITY BOARD
50 The Octagon | Dunedin 9015 | PO Box 5045 | Dunedin 9058 | New Zealand
E dcc@dcc.govt.nz P +64 3 477 4000 www.dunedin.govt.nz

To Whom It May Concern

20th August 2021

We write in support of the funding application being made by the Dunedin Tracks Network Trust to provide financial support for the Coastal Communities Cycle Connection as they embark on the detailed technical feasibility study to establish a cycleway through our community board area - from Waikouaiti south to Waitati.

We supported recent public meetings which were held to gauge public support for this cycleway project, and we were buoyed by the extensive level of support which exists in our communities.

We believe that it is essential to provide safe cycling routes away from the rather dangerous stretches of state highway which traverse our geographical area and we ask that you provide the requested funding so that some real progress can be made to get this worthwhile project underway.

Kind Regards

Alasdair Morrison
Chairman
Waikouaiti Coast Community Board
Email: info@calmarine.co.nz
Ph: 0274 354 384

Appendix 6. Letter of support from Department of Conservation

Department of Conservation
Te Papa Atawhai

DOC-6760261

Emily Cooper
Coastal Communities Cycle Connection Group

emily@emilycooper.co.nz

Tēnā koe Emily

Coastal Communities Cycle Connection- Funding application for feasibility study.

Thank you for meeting with us to discuss and outline your proposal for a cycleway connection project to link Coastal Otago communities.

I understand you are seeking funding to carry out a feasibility study to investigate walking and cycling options north of Dunedin. I would like to express the Department of Conservation's (DOC) support for the Coastal Communities Cycle Connection Group to obtain funding for a feasibility study for the proposed cycleway project connecting Dunedin, Waitati and Waikouaiti.

The proposal is consistent with DOC's Heritage and Visitor Strategy principles of: Protect, Connect and Thrive. This means that the natural, cultural, and historic heritage of places across DOC land needs to be protected first. Visitors can then experience and connect with these places. The protection and enhanced visitor connection will help support wellbeing and enable communities to thrive.

A cycle connection would provide a carbon neutral way for New Zealanders and visitors to visit these coastal communities, building a connection with nature and allowing these communities and visitors to thrive in the process through an increase in local economy and wellbeing.

DOC is supportive of the feasibility study and would like to work closely with the Coastal Communities Cycle Connection Group, Hamish Seaton and any other consultants involved to ensure the ecology across DOC land is considered in the planning of this project and to protect the natural values in the area. We would also ensure that those planning the cycleway are aware of the rules which limit cycle access to certain bits of DOC land. These rules are currently being updated via a 'partial review' of the Otago Conservation Management Strategy.

DOC is also supportive of the Coastal Communities Cycle Connection Group seeking endorsement from members of Kati Huirapa Runaka ki Puketeraki enabling them to exercise mana whenua.

I would like to highlight the need to formalise the permission to install any infrastructure on Public Conservation Land via a DOC community agreement or concession before work commences. A concession would also need to be obtained should you choose to take the approach of the Clutha Gold Trail and become commercial.

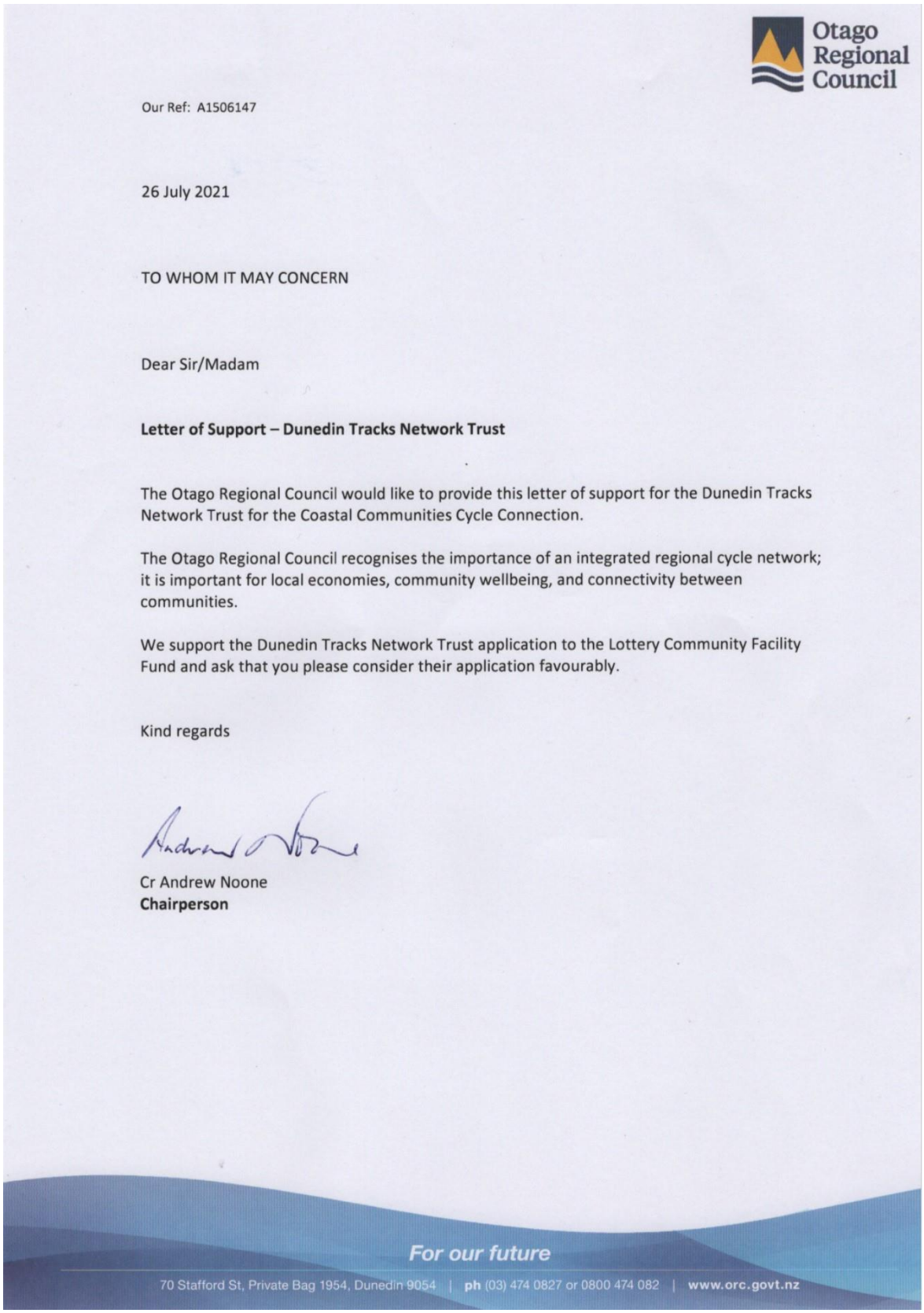
Te Papa Atawhai | Department of Conservation
Coastal Otago District Office
PO Box 5244 Moray Place Dunedin 9058
www.doc.govt.nz

Should a resource consent be required this letter should not be considered affected party approval or approval generally in respect of the Resource Management Act 1991 (RMA). DOC has a specific role in respect of the RMA and retains its ability to fulfil this regardless of support for this funding application.

Kā mihi nui
Annie Wallace

Operations Manager
Coastal Otago District Office
Te Papa Atawhai
Department of Conservation

Appendix 7. Letter of support from the Otago Regional Council



Otago Regional Council

Our Ref: A1506147

26 July 2021

TO WHOM IT MAY CONCERN

Dear Sir/Madam

Letter of Support – Dunedin Tracks Network Trust

The Otago Regional Council would like to provide this letter of support for the Dunedin Tracks Network Trust for the Coastal Communities Cycle Connection.

The Otago Regional Council recognises the importance of an integrated regional cycle network; it is important for local economies, community wellbeing, and connectivity between communities.

We support the Dunedin Tracks Network Trust application to the Lottery Community Facility Fund and ask that you please consider their application favourably.

Kind regards

Cr Andrew Noone
Chairperson

For our future

70 Stafford St, Private Bag 1954, Dunedin 9054 | **ph** (03) 474 0827 or 0800 474 082 | **www.orc.govt.nz**

Appendix 8. Evidence of Community Support

Emails and letters of support from members of the community

17 August 2021 Judy Martin:

I am particularly interested in having a safe, fast and reliable cycle connection between Waikouaiti and Karitāne, and Hawksbury village between. These villages are very closely linked socially and economically, indeed our local community organisation, POWA (Progress of Waikouaiti Area) was formed to serve this exact area. However, apart from one very narrow lengthy and hilly gravel road, the only connection across the Waikouaiti River that divides them must include a 3 kilometer stretch of State Highway one that is without adequate shoulder, let alone a safe cycle path. I know many people who would love to cycle from Waikouaiti to recreational classes and activities such as at the Mona Gow Pool in Hawksbury but feel too unsafe to do so. Any safe form of cycling across the Waikouaiti river and the flats surrounding it would enhance the social cohesion fitness and health of our joint community.

Judy Martin
Chair, POWA (Progress of Waikouaiti Area)

17 August 2021 Dick Martin:

I am a 74 year old Waikouaiti resident and write from this perspective. I ride an e-bike nearly every day around Waikouaiti for health, economic and environmental reasons. Beyond Waikouaiti I reluctantly use a car for the reasons outlined below. My main bike is a cargo bike with a 100Kg load capacity, an entirely practical car replacement.

The communities of Waitati, Evansdale, Karitāne, Waikouaiti, Palmerston are all located close to each other. In the 19th century they were a comfortable horse ride apart. There is considerable social and economic interaction between these townships due to their proximity. Dunedin is currently accessible by e-bike from Waitati, but the hills are a challenge.

But increasing vehicle traffic - cars and particularly trucks – render cycle and foot traffic along SH1 impractical. Only the bravest attempt it and certain sections are particularly intimidating, such as Waikouaiti to the Karitāne turnoff due to the minimal shoulder width.

Those wishing to travel the short distance between Waikouaiti and Karitāne but wish to avoid SH1 have to use Ramrock Road and then turn towards Orbells Crossing,
then Hawksbury Village before joining the Karitāne turnoff. This detour, along an often rough, dusty metalled road, is really only feasible for an MTB style bike (Mountain Bike) and can itself be intimidating for inexperienced riders due to the increased distance and the nature of the road surface.

Waikouaiti to Palmerston has a 'back road' passing Hawksbury Bush and along
Horse Road coming onto SH1 a short distance from the Goodwood Road, which offers
quiet travelling to Palmerston. But the first part of this journey is again challenging for the inexperienced; a rough metalled surface and extra distance with hills. The SH1 section which this detour avoids is fast, has many trucks and is very intimidating on a bike or by foot.

The Kilmog section of SH1 is again intimidating to bikes. Most riders choose to take the Coast Road, which again is challenging because of the hills. There is no practical detour around the Evansdale/Waitati section of SH1.

As cars and trucks have come to dominate SH1 between these settlements other transport modes; bikes, foot, even horses have been excluded forcing people themselves into cars because it is, or is perceived to be, currently the only safe way to move between these places.

Dependence on cars for travel has had enormous environmental, health, recreational and social implications. e-cars will not resolve all of these - their presence will continue to intimidate and displace other forms of human-powered transport. It is acknowledged that we must move away from energy intensive transport modes towards more sustainable ones, and do so rapidly.

There is thus an urgent requirement and desire to provide direct, accessible routes for bikes, e-bikes, foot traffic, horses between these North Otago settlements which avoid SH1 and provide a reasonable riding/walking surface, avoid hills as much as possible and provide the opportunity for safe, enjoyable travel for people of all abilities. Funding for an examination of all of the possibilities is vital; adjacent to the railway line, unformed paper roads, private land purchase or easements, etc. We have only a few short years to radically change how we travel, and the short distances between our settlements are typical of the distances dominating the majority of car journeys at present, which could be so easily replaced by human-powered modes for many people, if only safe, convenient routes were accessible.

18 August 2021 David Yeager:

Hello Emily, My wife and I do not have a motor vehicle, we rely on our bikes and public transport. We wholeheartedly support any extension of the cycleway network, especially in the waikouaiti / waitati region where we live. A railmotor (bike friendly) would be great too! Contact us if you need any help with this project. Cheers! David Yeager.

18 August 2021 Pat Sivertsen:

Hi Emily

I'd love to be able to ride more directly/quickly between Karitāne and Waikouaiti. I don't think that SHI is safe. There is the bridge and the sharp bend has no shoulder south bound. Normally I ride via McGrath Rd and Ramrock Rd. It's a nice ride but not a quick trip to the library etc.

Pat Sivertsen

18 August 2021 Reinet Murphy:

To Whom it may Concern

Please support the Dunedin Tracks Network Trust application for funding for some of the following reasons.

I live in Waikouaiti. My main transport is walk or cycle. I am currently involved in several local community groups and activities. I do not own a car or motor vehicle. I rely on the limited local Palmerston bus service with no service Saturdays and Sundays.
It is a black spot between Waikouaiti and Karitāne that section of highway is particularly dangerous for motorists and heavy vehicles and frankly terrifying for cyclists. We need a safe alternate route between our coastal villages.

At Karitāne and Hawksberry we have the Marae the Community Swimming Pool and Community Hall offering activities I am unable to participate in because I can not safely ride or walk there. Waikouaiti has the Library the Events Centre and Sports facilities and many clubs. A cyclewaywalkway would benefit both communities.
A project like this facilitating safe access, assists health benefits for many as well as reducing road congestion.

Kind Regards
Reinet Murphy

18 August 2021 Neil Campbell:

Hi Emily,
Thank you for the update on the East Otago Coastal cycleway project.
I am in full support of this project and the plan to seek funding for a feasibility study in preparation for construction.
I believe such a facility will provide access for people to enjoy the environment and connect the growing communities along the route. I look forward to a successful outcome.

Neil Campbell

18 August 2021 Hilary Yeoman

I strongly support Emily's application for a feasibility study. I have cycled on the road and walked beside the railway track to reach Waikouaiti and, on both routes, have yearned for a nice safe alternative. I hope the suggestions below are useful:-

1. A cycle/walkway would provide a link between 2 small rural communities that already share facilities but only have access by car or very occasional bus.
2. The main road has very little space for cyclists or walkers, particularly on the river bridge and the sharp bend and is too daunting a prospect for most people.
3. Currently, in the absence of an alternative, some people take the risk of walking along the railway track, which is both illegal and hazardous.
4. A safe track would be of a distance that would give a good amount of exercise- important with rising levels of obesity, diabetes etc.
5. It would give access to the library, medical centre, shops and cafe for Karitāne people and to the Huriawa peninsula, beach and boating for Waikouaiti people.

6. The success of existing cycle ways demonstrates how popular this type of recreation is, especially if it was a part of a longer link of tracks between Oamaru and Dunedin.

7. In addition to everyday use for locals, It would be a strong attraction for the many cycling tourists who currently use the main road before branching off at Karitāne to go on the coast road to Evandale and for driving tourists wanting to get out of their cars for a spell.

   Thank you for doing the hard work of putting something together. It would be great if this came about before we are too ancient to use it.

   Hilary

18 August 2021 Nick Scott:

As an engaged community member and farm land owner I fully endorse the proposal of a cycleway linking our coastal communities through to Dunedin. It is in my mind a clear opportunity to create a great resource that will benefit a significant segment of our community in all forms; including recreation, commuting, tourism and more. The longer term economic benefits a cycleway will likely bring will be a much needed boost to an area reliant on industries that have historically come and gone depending on global demand and government policy.

Nick Scott

18 August 2021 Ross Becker:

Hello Emily
As an 80 year old I use cycling as my way of keeping fit & active. I prefer to use off road cycleways & your groups proposal for this network is so important for the health & welfare of retired citizens. I have cycled the Alps2ocean trail twice & the design of the trail is superb. I strongly support your choice of designer.
I really hope your application is successful.
Regards
Ross Becker

20 August 2021 Jenny Haydon:

I live in Warrington. I ride a bike for most of my journeys, to the local shop, to my workplace, to the Library, to visit friends, to take Mt. Cargill Road and shop in North East Valley.
Most of the everyday things that I do involve riding on State Highway 1.
This road has narrow shoulders, and I feel unsafe for most of my time on that highway.

i have no choice but to travel from Warrington on State Highway 1, there is no alternative route.

I am keen for the cycleway to be built, and hope this that will solve this problem for many of the cycling residents north of Waitati.
I would like to see this part of the cycleway given priority as this really is a hazardous piece of road in any vehicle, and on a bike it is terrifying at times.

Regards Jenny Haydon

25 August 2021 Julie Gemmell:

A cycle trail between Waikouaiti and Karitāne would I believe bring many benefits to both communities.

Historically Waikouaiti has been the centre for both communities and the wider area for local government services , medical clinics and a broad range of services we now know as being essential. Many sporting and social activities are based in Waikouaiti.

Childcare facilities
Plunket rooms
Library and council service centre
Medical centre
Police station
Veterinary clinic
Car mechanics
Retail oulets eg hardware store and bakery

Although the two communities are just 6.5 kms apart the only access is via State highway 1 , a very busy and dangerous road to walk or cycle. For Karitāne residents to access the above facilities they must do so by car.

30 August 2021 Tim Locker:

I would like to see a cycleway between Warrington and Waitati built so that cyclists of all ages and experience can ride safely between the two towns. Warrington people would like to cycle to visit the Waitati Library, shop, cafe, Doctors point, and Orokonui wetlands and Eco-sanctuary on bikes. Waitati people would like to be able to visit Warrington beach, Arc brewery, surf club and coast Rd to Karitāne on bikes.
Some also enjoy riding into Dunedin regularly via the Mt. Cargill road, but feel unsafe on Highway 1 between Waitati and Warrington.
Tim Locker
1A Hill Rd. Warrington

30 August 2021 Elspeth Moody:

My reasons for wanting this cycleway to go ahead are for safety and for the community and for the environment. The communities from Waikouaiti to Waitati belong together - people from these communities move between them all the time, for family, schooling, socialising, shopping, libraries, recreation, cultural activities and so much more. Because the route between them necessitates travelling on State Highway 1, the only safe way to do this, regardless of how small the distance between communities, is to get in a car. A cycle/walkway would allow for a safe, family-friendly, emission-free, healthy way to keep our communities connected.

Ngā mihi,

Elspeth Moody

22nd August 2021

Nigel Stevenson

Karitane

To whom it may concern.

RE: **Dunedin Tracks Network Trust** Grant Application

I offer full support to the proposed project of having a coastal cycleway in the East Otago region. A cycleway would greatly benefit locals and visitors alike. The cycleway would allow locals to connect to the adjacent villages without attempting to negotiate the treacherous State Highway 1 with its narrow bridges, speeding traffic, large vehicles and blind corners which must be encountered if cycling from Karitane to Waikouaiti for example. By allowing the locals to easily commute between the adjacent villages would have both positive economic and will increase the local and national social capital.

Between Waikouaiti and Waitati and beyond is one of the most stunning stretches of coastline New Zealand has to offer and will be a "Must Do" for cycling visitors to the area whether they be domestic or international visitors.

Personally, I greatly value the section of road between Karitane and Warrington as a regular and almost sole cycling route. I have a personal goal of biking this stretch of coastline on every calendar day of the year and as of today I stand at 178 return trips and is a section of coastline I never get bored with. Part of the reason I chose this section is because the only other alternatives must incorporate State Highway 1 and you put your life in peril when attempting to ride on the highway in a literal and not a figurative sense. By having a cycleway, a cyclist's range can safely be greatly extended.

In a world where electronics are becoming a "go to" form of recreation we need more initiatives like this cycleway. I can envisage this cycleway will go from strength to strength and will be an ongoing legacy, it cannot fail and will not go by the wayside as often happens with initiatives with much less potential.

Many thanks

Nigel Stevenson

21 August 2021

Emily Cooper
Coastal Communities Cycle Connection
WAIKOUAITI emily@emilycooper.co.nz

Dear Emily,

LETTER OF SUPPORT: DUNEDIN TRACKS NETWORK TRUST

In these days of climate change, safe options for cycling and walking are urgently needed to reduce vehicle dependency as well as to encourage health and exercise.

However, at present there is no safe route for pedestrians or cyclists between Waikouaiti and Dunedin. For virtually the whole distance between Waikouaiti and Dunedin City cyclists and walkers are forced to use either State Highway 1 or alternative roads that have many blind bends and are narrow with no shoulder to escape from overtaking vehicles.

As residents of Waitati and keen recreational bikers (both in NZ and overseas) we are very aware of how limited local cycling options are. For instance, Waitati and Warrington are both part of what is functionally a single Blueskin community with largely shared services and facilities. However, except for those prepared to brave the daunting and intimidating traffic on SH1 on foot or bike, use of a vehicle is essential to access the various scattered local services (shops, library, church, clubs, etc.).

Better provision between Waikouaiti and Dunedin is sorely needed and a cycling/ walking path would be a huge asset to the area, especially now that e-bikes increasingly mean that hills are no longer a deterrent.

We heartily support the application to the Lottery Grants Board for funding towards a feasibility study.

Your sincerely,

Stuart and Jean Strachan

25th August 2021

TO WHOM IT MAY CONCERN

Dear Sir/Madam

Letter of support- Dunedin Tracks Network Trust

My husband and I have been living in Hampden for the last 17 years,on a lifestyle property.

We are both fit,active people in our 60s. One of our hobbies is cycling,and the Alps to Ocean is a favorite track of ours.

However it would be better still if we could bike locally,with safety. At present we have to negotiate SH1 to get to any more pleasant places for riding. After several scary incidents I no longer wish to ride along SH1,so we have to transport our bikes by car.

If there was a safe cycleway between our town and Dunedin and/or Oamaru,we would both be enthusiastic users. It would be a great step forward for our future,and indeed the future of the planet,as it would,in a small way make it less necessary to use a car to get places. We both have electric bicycles,which is becoming very common in our age bracket,and would like to use them more locally,if possible.

We sincerely hope that the Dunedin Tracks Network Trust is successful in its funding application to the Lottery Community Facility Fund.

Kind Regards,

Mr and Mrs R J and I A Welton

17th August 2021

To whom it may concern

Dear Sir/Madam

Re: Letter of support - Dunedin Tracks Network Trust

I have been resident in Waikouaiti for fifty years and for the past fifteen years there has been significant interest in a cycle network to join Karitane and Waikouaiti, unfortunately prevented by the barrier of the Waikouaiti river and lack of support by the NZ Railways. This proposal is part of a much wider plan, which should enable such barriers to be overcome.

The East Otago Coastal community is mostly rural, and as such has always been keen to pursue outdoor activities. This project will enhance the health and wellbeing of the community enabling increased connections between these two rural towns (and more) while avoiding the need to cycle along the state highway. Having spent my career as a nurse and educator within mental health services I am only too aware of the benefit of outdoor activity and the need to stay well connected within our communities. Future planning around transportation is about placing an emphasis on getting people out of their cars and into using more ecofriendly alternatives.

I fully support an application to the Lottery Community Facility Fund by the Dunedin Tracks Network Trust for a feasibility study to explore the potential for creating the proposed cycle network.

S. McKewen

Shirley McKewen PDN, BN, MA

Community support - Facebook

In the Facebook group Coastal Communities Cycle Connection on 18 August 2021, members were asked to support this funding application with a reply to the question *"Why do you want this cycleway?".* The comments are collated here:

David Ellison:
I wish you the best of luck in your efforts to build a cycle track through East Otago. The idea was a dream twenty years ago, but we didn't have the necessary technical know how then. No reira, kia kaha, kia toa, kia u ki tenei kaupapa. Upoko Puketeraki.

Worik Stanton:
I want to be able to bicycle to the pub at Evansdale from Waitati.

Helen Carter:
Beautiful bird life. A way to cycle safely to our neighbouring communities to access library shop pub bakery beaches. The distances are small between our communities and are achievable for old and young.

Elizabeth Guthrie:
Safe access - very unsafe to mix with cars!

Becs Wilson:
Safe cycle way, biking better for the planet, better for the community.

Sarah Lou:
It would encourage more people to travel in this area in a more gentle way. We want to be able to access our neighboring towns without a car so we can enjoy the amazing environment we live in.

Jane Schofield:
I biked over the Waikouaiti bridge and it's very scary! I would love to safely bike to the library in Waikouaiti.

Noni Callander:
I would dearly love a cycle way that safely connects different parts of our beautiful area. I live in Waikouaiti and I cycle for fitness and mental well being 2-3 times a week. I am in my 70,s, an ex runner with arthritis, so cycling is a valued liberating form of exercise. New cycle paths would open up new vistas, wild life areas, beaches and fellow cyclists that we don't find when just cycling round and round beautiful Waikouaiti.

Mairi-Jean Collier:
If there was one from Waikouaiti going through Karitāne to waitati the kids would love to be able to bike to school again :-)

Haxby Abbott:
Motor vehicle traffic can be a barrier to many people choosing active transport or recreation; a cycleway removes that barrier, encouraging more people to participate, with greater enjoyment, safety and health benefits. Cycle paths bring economic benefits to small rural communities without environmental costs.

Sandy Isbister:
As Warrington crib owners we would love safe cycling options connecting our communities - we currently drive to Dunedin to cycle the Portobello and Pt Chalmers trails. When doing cycle trails around the country we always spend money at cafes on the trails.

Rowan Giselle:
Building strong communities through engagement and interaction. Our family visit Waikouaiti often for family, friendships, sport, shopping, library, events etc be so great if my kids had independence to transport themselves rather than relying on cars (ie me driving!!).

Beatrice Lee:
I would like for my boys and I, and anyone else who lives up Double Hill Road, or wants to visit the Silverpeaks to be able to bike on a bike track, not on the shoulder of SH1, to and from Waitati to Double Hill Road - which at present is very scary for kids. I would therefore put in a plug for a track on either side of SH1 but not the option of a causeway in the bay, as we would not be able to access it across the railway tracks. More and more people are living up our road, and I think a safe bike track would be used.

Kate Wilson:
Be wise we need to have an affordable carbon zero way of connecting communities. And providing for biking tourism connecting north.

Amee Kathryn Parker:
I would love to be able to safely ride between Waitati and Warrington and north of Warrington if possible. We regularly commute between these locations and would do it on a bike if it was safer.

We have a young child and there's no way I'm endangering him by riding on that highway.

Wendy Phizacklea:
A cycleway to Karitāne from Waikouaiti would be a massive benefit to the area for both residents and visitors. SH1 is just too busy and dangerous to use, so an alternative would encourage us all to enjoy our beautiful surroundings on 2 wheels.

Jan Jones:
So beneficial for both Karitāne and Waikouaiti to be connected because we share all services and the need to have a safe cycling / walking track would be the answer.

Emily Sterk:
We'd love a safe bike route for the kids between Warrington and Waitati, Karitāne, and Waikouaiti. It would be fantastic for visiting friends and exercise. I think it would be a real asset for the community and attract visitors to the area as well.

Bex Williams:
I'd love to ride with Hank to school in the mornings.

Kate Gnoth:
We would like a safe possibility to cycle north of Waitati, for mainly recreational purposes. It is both frustrating and dangerous to be reliant on SH 1 to access the northern reaches of our community.

Grant Day:
As a keen cyclist who although I live in Canterbury, I regularly use the existing cycle infrastructure (e.g A2O, Central Otago Rail Trail etc.)

I believe this link will be a great steeping stone for the potential link between Oamaru and Dunedin which will in turn connect these other great cycle trails and greatly benefit the local communities that these cycle trails pass through, both economically and in the form of health and well-being.