

Around The Mountains Cycle Trail

Route Selection and Construction Elements

(April 2011)

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1 Introduction

This report identifies the chosen/recommended route in some detail, based on site visits through walkovers or by vehicle. In addition to route information, this report also contains cycle trail construction information, property and fencing information, and other technical information which is not appropriate to record in other reports. This report does not detail bridging information.

At the outset of the route investigation, the selection of the route has been based on the following considerations:

- Trail to be designed for users of moderate fitness requiring generally easy gradients and an appropriately 'low roughness' surface.
- Desirable maximum horizontal gradient of (3.5% to 4%)
- General flow of cycle traffic from Walter Peak/Mt Nicholas Station, in anti-clockwise direction to Mossburn, Lumsden and north to Kingston
- Endeavoring to maximise scenic and environmental experience.

Some of these elements have, by necessity, been compromised in some locations or for certain lengths of trail. The exceptions are highlighted in this report.

In general, guidance on the route location has been taken from Mike Barnett, who accompanied MWH staff on all site visits and field excursions. MWH staff have worked with Mike to improve the route selection based on our engineering expertise in various areas.

Any information relating to property access or easements has come from Mike Barnett. MWH has had no contact with land owners.

2 Trail Specification

The track types to be used in this report and illustrated page 4 & 5. Also indicated below are construction methods proposed for the parking amenity areas.

Table 2-1: Track Types and Construction Information

Trail Type	Construction Details
Type 1	Trail on existing road (sealed or unsealed). Road surface considered adequate for cycle trail and no work required.
Type 2	Trail on former railway embankment. Construction would only require some vegetation removal and void filling with AP20.
Type 3	Trail also on former railway, but surface has deteriorated. Construction would require vegetation clearance, minor surface excavation/scraping, a sub-base of a coarse granular fill, and AP20 surfacing. May require drainage cuttings.
Type 4	Trail on weak sub-grade (such as deep silt on river terraces). Construction would require vegetation clearance, excavation to approximately 200mm, filter fabric base (stops track material being pushed into soft base), coarse granular fill and AP20 surfacing. May require drainage cuttings.
Type 5	Trail over weak swampy ground. Construction would require vegetation clearance, probably no excavation, use of plastic mesh mat to give base strength and prevent sinking, plus filter fabric, coarse granular fill and AP20 surface. Will require drainage treatments.
Type 6	Trail cut into side of sloping ground – as slopes may vary, this specification nominally considers a 25 degree slope cross fall. Construction will require vegetation clearance, excavation as required, granular fill and AP20. May require drainage.
Type 7	Shoulder of highway – ground may vary depending on road construction. Typically allowing removal of topsoil, coarse granular sub-base and AP20 surfacing.
Car parking areas	Typical parking area will require vegetation removal, coarse sub-base and AP20 surfacing.

2.2 Design Criteria

Grade	Grade Description
<p>1.</p> <p>Easiest Cycle Trail</p>	<p>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.</p> <p>Gradient: 0-2 degrees for 98% of trail on any one day, maximum 4 degrees, and more than 2 degrees gradient for no longer than 200 m at a time. If the track is designed to be predominantly in one direction then the downhills can be steeper (up to 5 degrees for long stretches or 8 degrees for stretches up to 20 m long, if a straight, flat section follows).</p> <p>Width: ‘Double trail’ preferred = minimum of 2.5 m for 90% of trail, where cyclists may ride side by side. ‘Single trail’ average width 1.8 m, with 1.2 m minimum.</p> <p>Radius of turn: 6 m minimum.</p> <p>Surface: Compacted/ stabilised base course or similar, with maximum top course aggregate of 20 mm.</p> <p>Watercourses: All water courses bridged</p> <p>Bridge Width: Recommended bridge width of at least 1.5 m, absolute minimum width 1.2 m wide.</p> <p>Obstacles: None. No stiles. Cattle stops should preferably be at least 1.5 m wide and minimum 1.2 m wide.</p> <p>Length: 3.5-4.5 hours/day (30-50 km/day)</p> <p>Barriers/Guard rails: Areas such as bluffs or bridges where a fall would result in death or significant harm require hand rails.</p>

Gradients

One of the key factors that determine whether a route will suit less experienced and less energetic cyclists is the gradient. Disused railways are ideally suited to conversion to cycle trails (coined “rail trails”) and are especially popular because the gradients are gentle

Refer: *Appendix, Cycle Trail Design Guide prepared for Ministry of Tourism, February 2010*

Refer: *Appendix, DOC’s Track Construction and Maintenance Guidelines (2008) provide a comprehensive account of the various stages of producing off-road trails. Designers are directed to sections of the DOC guide for subsequent considerations.*

3 Route Selection

The Around the Mountains Cycle Trail will follow the existing road from Walter Peak to the Oreti Bridge on the Mt Nicholas Road before following the true left side of the Oreti River to Way Point 223 from this point to Mossburn the trail is on the true right of the Oreti River. From Mossburn the trail will follow the old railway line formation to Lumsden and then on to Kingston.

For the purposes of this report the route has been divided into a number of distinct sections which reflect the changing character of the trail. The trail is described in the direction of proposed cycle flow (ie Walter Peak – Mt Nicholas – Mossburn – Lumsden – Kingston).

During the site investigations, waypoints were taken at regular intervals along the route. These were used to identify: changing trail treatment types; bridge crossing points; trail switchbacks, and toilet locations. The route and waypoints were subsequently plotted on the Route & Structure Asset Maps which are included in the accompanying maps booklet.

Structural elements such as bridges are described in detail in the report titled “Bridges and Structures.

A breakdown of properties and property ownership within 30m of trail alignment is given as an attachment to the Plan Booklet. References to property ownership made in the following sections should be referred to that table.

3.1 Walter Peak to Oreti River Bridge (DOC Carpark) – 24km.

This section is illustrated on Sheets 1 to 13.

The cycle trail commences from the wharf at Walter Peak and traverses the existing formed gravel surface of Mt Nicholas Beach Bay Road, Von Road and Mt Nicholas Road as it progresses south over this section.

Three bridge structures are required over this section to act as alternatives to the road fords in wet weather. Access to the bridges will be by narrow, single track, typically 1.8m wide. These fords/bridges are waypoints 102, 109 & 110. They are shown on Sheets 3 and 12. Track length bridges have not been shown (minimal).

Property

The wharf is publicly accessible, and the road is public road. The bridge bypasses will intrude into Mt Nicholas Station land. Easements in principle have been granted by the land owner for these.

3.2 Oreti River Bridge (DOC Carpark on Mt Nicholas Road) to the Suspension Bridge crossing Oreti River - 22 km

The proposed cycle trail between the DOC car park on Mount Nicholas Road at the suspension bridge over the Oreti River can be separated into the following sub-sections:

3.2.1 DOC Car Park to Three Kings – 17km

This section is shown on sheets 13 to 28.

This section commences at the informal DOC car park on the north side of the Oreti River Bridge on Mt Nicholas Road and is located within the DOC conservation estate on the east side (true left) of the Oreti River.

The track starts approximately 200m north of Point 111 on Sheet 13.

The first 4.0km of the trail follows a former 4 wheel drive track over gently undulating tussock covered river flats located above the flood plain. The track is located on hard underlying river gravels and trail construction is anticipated to be uncomplicated. A gravel source will be required adjacent to this section and it is anticipated that it will be available from the flood plain.

The average falling gradient is 1.5 degrees (2.5%) to the Ashton Creek Bridge crossing at Point 127 Sheet 14.

The second 1.5km section between Ashton Creek at Point 127 and DOC's Upper Oreti Hut at Point 134 generally continues along the 4 wheel drive track on the northern approach to the hut. The maximum proposed gradient on this approach is (4%). Several short bridges are required.

The next 1.5km section from Upper Oreti Hut falls gradually to the south west along undulating tussock country continuing along the 4 wheel drive track. The trail alignment falls progressively along low to moderately raised and undulating river terraces crossing a swampy area.

Short sections of trail cut into the terrace riser will be required to elevate the platform above the flood plain.

A series of zigzags from 153 takes on an easy gradient up Lincoln Hill onto the old 4WD Track. The trail drops away from the formed track to avoid a rugged spur at Point 173 prior to regaining the 4 wheel drive track on the upper river terrace.

The trail continues on the alignment of the existing track across an undulating tussock covered terrace to the foot of a large elevated promontory which will require a series of long zig-zags to climb through bush to the upper grassed ridge at Point 181. An additional number of zig-zags to traverse the ridge and further long zig-zags through native bush are required to return to the lower levels to the south of the promontory feature. The ridge of the promontory offers excellent views up and down the Oreti River valley.

Construction of the trail over the promontory will require the cutting of secondary growth beech forest platform for the trail. A maximum climbing gradient of 4% is desirable to the crest of the promontory and falling gradient of up to (10%) is proposed.

The trail on the south side of the promontory will continue southward for a further 1.5km through a stand of secondary growth native bush before emerging onto tussock land at Point 183. A 33m timber bridge will be required for a stream crossing at Point 182 on this section of trail.

The next part of the trail section is cut into the toe of the slope to clear the floodplain. It is intended that a margin of existing bush or scrub will be retained between the trail and the toe of the slope to soften the effect of cutting.

The alignment of the old 4 wheel drive track is now resumed at Point 193. The river is aggressively eroding the toe of the slip which extends a considerable height up the adjoining hill slope. At this location rock protection is required and the cycle trail constructed on top of the rock protection (In total along this stretch of river there are three sections requiring rock protection totaling 360 m).

From point 193 to 193V the cycle trail follows predominantly on the old 4WD track with a number of small bridges and small culverts i.e. culverts less than 1 m or less in diameter.

Property

The trail in this section passes over DOC's Eyre Mountains Forest Park, for which concession will be required to allow trail construction.

3.2.2 Oreti Road (Three Kings) to Oreti Suspension Bridge – 8km

This section is shown on sheets 28 to 33.

This section commences from Three Kings Shelter immediately downstream of the Three Kings, and extends via river terraces to the Oreti River Suspension Bridge crossing the Oreti River to the true right of the River.

The trail crosses a suspension bridge at point 200, then climbs up a series of 3 switchbacks to another promontory at a gradient of 2.5% to 4% descending down the other side at a gradient of 6%. The ridge again offers excellent views up and down the valley.

The next section follows remnants of a previous track and is located in part through native bush and in part will require a siding cut above the toes of the side slop to avoid wet areas.

The trail picks up an existing track around Windy Point in the proximity 500m past point 215 then climbs to a higher terrace. This higher terrace between Points 220 and 223 is elevated above the flood plain. At point 223 the trail crosses the Oreti River over a 95 m suspension bridge to the true right-side of the Oreti River.

Property

This entire section is on DOC estate and will require concession to create the track.

3.2.3 Switchbacks Three Kings

Approximately 700 meters of track with three switchbacks, coordinates below.
The three corners had the following specs, *Refer: Page; 28 Asset Maps*

1. Top switchback: GPS coordinates E1129916 N5517610.

Radius 5 meters

Cross-slope 20 degrees

Track above and below 2 degrees

Maximum retaining wall height 1.4 m

Maximum cut with 1:4 batter 1.5 m

2. Middle switchback: GPS coordinates E2129776 N5517546

Radius 5 meters

Cross-slope 17 degrees

Track above and below 2-3 degrees

Maximum retaining wall height 1.25 m

Maximum cut with 1:4 batter 1.5 m

3. Bottom switchback: GPS coordinates E2129930 N5517650

Radius 4 meters

Cross-slope 25 degrees

Track above and below 2 degrees

Maximum retaining wall height 1.5 m

Maximum cut with 1:4 batter 1.65 m

3.3 Oreti River Suspension Bridge to Mossburn – 24km

Page 33 to 50

The proposed cycle trail from point 223 Oreti Suspension Bridge to Mossburn is a new sub section.

These areas would also require fence line realignments and easements to accommodate the cycle trail footprint with Landcorp, Landcorp have granted an easement in principle. The trail continues to head south on the outer fringes of the grazing areas and the DOC Eyre Mountains Conservation Park.

3.3.1 Oreti Suspension Bridge to Mossburn

The trail passes through Southland District Council owned gravel extraction pit. From point 531A the cycle trail follows an existing 4WD Landcorp track on the outer edge of a pine forest plantation, then continuing along the river marginal strip occasionally entering Landcorp farming to just past point 515A, at this point the cycle trail enters Department of Conservation lease/ private farmland.

The cycle trail follows along a marginal river strip then through private farmland to point 516 and passes over a 9.75m bridge. At point 517 and point 518 there are 2 precast 18 m concrete bridges. From just past GE 12A where the cycle trail enters private farmland to point 520 the cycle trail would require new fencing along one side of the cycle trail.

At point 520 there is a 18m precast concrete bridge. From this point the cycle trail runs parallel to state highway 94 on a combination of private easements and New Zealand Transport Authority road marginal strip to opposite Block Road. At this point the cycle trail follows along on top of a flood bank to point 521. At this point there is a 60 m flood bank acquired from the existing flood bank to a 36m precast concrete bridge. A wire rope or barrier approximately 250 m in length is required at this point to separate vehicle traffic and bicycles.

From here the cycle trail travels through marginal river strip to Mossburn.

Property

DOC Eyre Mountains/ Landcorp to just past point 515A the trail passes through DOC lease/ private farm land and New Zealand Transport Agency Road Reserve.

3.4 Mossburn Road to SH 94 Intersection to Lumsden – 18.6km

The proposed cycle trail between Mossburn and Lumsden can be separated into the following sub sections.

Through Mossburn the cycle trail travels along Cumberland Street, along Devon Street to the eastern town boundary.

Property

Southland District Council, NZ Transport Agency.

3.4.1 Mossburn to Oreti River Bridge near Lumsden (SH 94 section) – 14.9km

This section is shown on Sheets 51 to 60

This section of the trail is proposed to be located on the south side of the highway until Sutherland Road then the trail is located on the North side of the road to the Lumsden Mossburn Bridge.

The trail will transition from widened highway shoulder to old railway line (8km) until just before Sale yard Road. From this point to Lumsden Mossburn Bridge the trail is on a combination of SH 94, roadside verge and easement on private land.

Property

Parts of this section of the trail are on former railway land, and as such some is owned by Southland District Council and some by Land Information NZ. Other sections are along NZTA road reserve. Approval from each of these parties will be required.

3.4.2 Oreti River Bridge to Lumsden – 1.7km

This section is shown on Sheet 60 to 63:

It is envisaged that the Around the Mountain Trail and the Lumsden to Bluff Trail will join at Lumsden.

The first section of trail heading south towards Lumsden will pass under the Oreti River Bridge structure and be aligned along the river side of the farm fence adjacent to the former rail embankment and flood bank for a distance of 0.8km. The alignment of the trail along the former rail on the inside of the fenceline would require an easement across the property.

The trail is then proposed to turn onto the top of a river flood bank for a further 1.0km. The top width of the flood bank varies from 1.5m to 3m. The narrower part of the embankment will require some widening to provide a width suitable for maintenance vehicles. The flood bank extends to the Lumsden Camping Ground immediately adjacent to the town.

Property

The northern section of this element will require an easement across the property then on roads owned by Southland District Council.

3.5 Oreti River Bridge to Five Rivers Road – 11km

This section is shown on Sheets 64 to 71.

The proposed cycle trail between the Oreti River Bridge north of Lumsden and Five Rivers Road is to be located along the former rail embankment on the west side of State Highway 6.

The former rail embankment is substantially intact but several replacement structures will be required at stream crossing points (see report section on structures). The embankment is considerably overgrown with willow and broom infestation over considerable lengths which will require clearing and spraying. Fencing requirements vary but generally range from nil to one side to the corridor to provide appropriate security to adjacent owners and trail users. There is, however, a section requiring

fencing on both sides at Lowther Siding Road to Lowther Road as the farmer grazes the rail reserve and would like to avoid his stock being allowed to wander.

There is parking available at point 338A

Property

This section of the route is entirely within rail reserve until a small easement by Lowther Road.

3.6 Five Rivers Road to Athol – 19km

This section is shown on Sheets 71 to 84.

The proposed cycle trail between Five Rivers Road and Athol is substantially located along the former rail embankment with the following exceptions:

An easement is proposed through the Andrews and Nind properties between Point 344345. This diversion to the east of the rail corridor between Andrews Road and Bixter Road is at the request of the owners and will provide appropriate separation and continued privacy for the Nind dwelling.

A deviation has been requested by property owners Oudhoff & Kerr who have farm buildings and activities refer page 77 maps.

A minor deviation is required around the horse training arena at Parawa Station Point 373.

An easement is proposed along the common boundary of the Wilkins property between the railway line and points. In an easterly direction to join the State Highway with the trail then extending along the west side of the highway until it intercepts the rail embankment again on the east side of the highway. Formal approvals will be required from the owners and from NZTA for this proposal. This deviation is proposed to avoid a major irrigator.

There is an 18 m precast concrete bridge at point 378, a 60m suspension bridge at point 357 and an 18m precast concrete bridge at a flood channel at point 358. A diversion along Eyre Street and Paddys Road into the main street of Athol.

A number of structures have been identified for replacement or upgrading along the section of trail. These structures are described in detail in the report titled "Bridges and Structures",

Property

As indicated above, the majority of the route is on rail reserve. There are some deviations proposed to consider local conditions which will require easements, and these have been negotiated with the landowners.

3.7 Athol to Garston – 10.8km

This section is shown on Sheets 85 to 93.

The trail then goes along Albion and Avon Streets and a private easement to point 360 a 25m steel bridge. From this point the trail is on a private easement cut along the foot of the terrace until merging onto Flagstaff Station Road.

The cycle trail which then crosses SH6 which is heavily overgrown with broom and overhung with willows which will require clearance and spraying.

It is proposed that fencing will be undertaken so that no adverse effects are resulting on the adjoining farms whilst ensuring the safety and security of the trail users. Fencing will allow existing grazing rights to be retained and provide continued stock and plant access across the trail at defined locations. After crossing over SH 6 there is a 18 m precast concrete bridge at point 379, a 5m bridge at point 379A and a 10 m Steel Bridge at point 384. This cycle trail then crosses SH 6 at Garston. Fencing of the trail along this section varies from no requirement along some parts to fencing of both sides in others.

The trail passes through a Council reserve in the center of Garston and adequate parking is available adjacent to the reserve and along the frontage of the adjacent church site.

Property

With the exception of Athol, the land for this section is rail reserve.

3.8 Garston to Fairlight Station – 5.1km

This section is shown on Sheets 93 to 96.

The trail crosses State Highway 6 on the north side of Garston at the south junction of Hume Road at Point 303. Hume Road is a Council maintained road which carries low traffic volumes, has a good existing gravel surface and is suited to the cycling activity.

The trail will cross the Matura River on the existing road bridge and extend along 3.6km of Hume Road to the north from where the trail reverts to the rail corridor to a substantial 75 m suspension bridge.

Property

This section of cycle trail extends along a combination of maintained roads and rail corridor.

3.9 Fairlight Station to Kingston – 13.7km

This section is illustrated on Sheets 96 to 103.

The final section of cycleway between Fairlight Station and Kingston will be located on the western side of the operational rail corridor (Kingston Flyer Steam Train), over a legal Council road (part formed) and DOC land.

The first 2.8km of trail is proposed to be located within an unformed road reserve immediately adjacent to the railway. The terrain is gently undulating tussock flats with underlying gravels which will provide a good base for the trail construction.

The next 1.15km of trail extends along the formed surface of Allendale Road. The trail from Allendale Road to Kingston is predominantly on a paper road, DOC reserves and a small easement on private land.

The final section of 5.8km from Point 389 which drops away to Kingston is planned to follow an easement over private land on the west side of the track. Following the general gradient of the rail track will ensure that satisfactory gradients are maintained over this section of the cycle trail.

Property

The route as proposed lies on a formed public road and paper road. The use of these has required discussions with the adjoining land owners.

4. Amenity Values

The 34 km valley section of the Eyre Mountains Conservation Park, where the cycle trail would be constructed is used by:

- a. Up to 6-8 fishermen fish this stretch of river weather permitting, at any one time in 3 to 4 beats (fishing areas).
- b. There are a small number of hunters who pass through the area, pig and deer hunting.
- c. There are also the odd permitted 4x4 trip by 4WD clubs.

4.1 Land Landscape Settings

The Conservation Order on the Oreti River and its tributaries was placed on the upper Oreti River, to protect the river from hydro development, and to protect the water quality as a fish habitat. It was never intended that this Conservation Order would be used to restrict the public from other recreation activities within the DOC Eyre Mountains Conservation Park. Fish & Game Southland say they are not opposed to other recreation groups using the Eyre Mountains Conservation Park, they are just opposed to a cycle/walking track and cyclists and walkers using the track.

It is acknowledged that Fish & Game Southland have invested resources into obtaining a Water Conservation Order on the Oreti River and developing a code of conduct for their members to fish this section of river. Fish & Game has developed this section of river into 3-4 beats i.e. only 2 fisherman on each beat at any one time or a maximum of 6-8 fisherman on this 34 km stretch of river at one time.

All activity excluding permitted 4WD trips in the valley at present are catch or catch and release fishing, pig and deer hunting i.e. active gathering and release or gathering and hunting fish and game.

Construction of the track for cycling and walking will allow the public the opportunity to undertake passive recreation in this area i.e. walking and cycling.

This valley within the Eyre Mountain:

- a. Has high scenic values
- b. The valley is highly modified with 98% introduced grass species
- c. The forest which the track passes through is regenerated beech forest, which was burnt over at the turn of the century
- d. 46% of the proposed new cycle/walking track would be on the existing old bullock track/modified farm track
- e. While 34 km of the track is on conservation land, 25.8 km of the track would have Landcrop Farming Ltd on one side of the valley, and DOC on both sides of the valley for 8.2 km. The track is in a front country setting.

- f. The cycle track comes within 5 m of the Oreti River for 1.2 km of its 34 km within the Eyre Mountains Conservation Park and in most instances for not more than 150m at any time

4.2 Department of Conservation

4.2.1 Eyre Mountains Taka Ra Haka – Cycle Trail

The Department of Conservation confirms its support for the proposed Walter Peak to Kingston Cycle Trail (Around the Mountains Cycle Trail) which will occupy part of the Eyre Mountain Conservation Park/ Taka Ra Haka.

“Construction for public use of the track is an activity consistent with the Mainland Southland/ West Otago Conservation Management Strategy. The Department also recognises the benefits of increasing recreational use of this area and the additional economic benefits to the community”. *Refer Appendix 12 Department of Conservation letter of 24 May 2010.*

4.3 Fish & Game Southland

Fish & Game Southland presented an option of the cycle trail following the Mararoa River, before merging onto the grass road verge of the Mavora Lakes Road. Fish & Game stated that they believed this was a better option/experience than developing a track within the Eyre Mountains. Fish & Game say they do not want a track developed for cycling and walking on within the valley.

Fish & Game Southland and Southland District Council undertook a joint site visit of the Mararoa River/Mavora Lakes Road option.

Fish & Game Southland also requested Southland District Council to undertake an economic comparison of the two route options to compare the numbers of cyclists who would ride the trail if either option was developed. This request was rejected as it would be impossible to quantify the number of cyclists who would not ride the Around the Mountains Cycle Trail if the Mararoa River/ Mavora Road option was the cycle trail route.

4.4 Mavora Lakes to Mossburn

When developing the scoping report for Around the Mountains Cycle Trail in 2006/2007 the Mavora Road was the first route option looked into. It was decided that this route would not be desirable as a section of the cycle trail for the following reasons:

- If the cycle trail merged with the road verge of the Mavora Lakes Road the cycle trail/ cyclist would be inundated with dust from summer traffic traveling to and from Mavora Lakes. The cycle trail would be on the road verge for 8 km to 10 km depending on variations to this option. This road is extremely dusty during the summer months and would be an unpleasant cycling experience.

Photos: Mavora Road



Photo: fine dust Mavora Road



Photo: Mavora Road, heavy traffic and dust



Photo: Mavora Road, cyclist wearing bandanna over face to mitigate breathing in dust

- The route option of the Mararoa River/ Mavora Road is longer by 3km than the cycle trail through the DOC Eyre Mountains Conservation Park, the preferred option is already 54 km. Ministry of Tourism identified that 50km was the maximum recommended distance for a grade 1 cycle trail. Grade 1 cycle trails are designed for a wide range of the public to be able to ride the trail (widest demographic market).
- This option would require an easement along the edge of Landcorp and the Mararoa River and easements across Landcorp farms getting from the Mavora Lakes Road to the Oreti River. This option would be significantly more intrusive on the day to day farm management for Landcorp than the proposed cycle route.

The Mararoa River/ Mavora Road option as a cycling experience can be described in 2 sections;

- Mararoa River section experience is similar as cycling through the DOC Eyre Mountains Conservation Park with vistas of mountains, river for 4km to 5km, including the section of the cycle trail cut through the forest. (In comparison the Eyre Mountains section is for 22 km to 25 km). The section of trail that follows along the terrace of Landcorp farming would be a similar experience to the cycle trail on the Oreti River when it crosses the suspension bridge to the true right of the Oreti River and follows along Landcorp farm boundary.
- Mavora Lakes Road Section, this section of trail would run parallel to the Mavora Lakes Road on a trail developed on the road side verge. This road leads to the DOC camping ground at Mavora Lakes and can be an extremely dusty road in the summer months. Cycling on the road side verge would be a dusty unpleasant cycling experience and is not compatible with designing/ developing a grade 1 cycle trail which will attract sufficient numbers of cyclists to stimulate employment and economic growth in the rural community's that the cycle trail passes through. The option of cycling through the DOC Eyre Mountains Conservation Park was identified as the preferred cycle route which

would be a higher quality cycle experience in comparison to the Mararoa/ Mavora option.

4.5 Ministry of Economic Development

When the Ministry of Tourism/ Ministry of Economic Development co-funded the Around the Mountains cycle trail in 2009, the Ministry asked Southland District Council to relook at the issue of developing the cycle trail following the Mararoa River and Mavora Lakes Road as a cost saving initiative. Site visits were undertaken to relook at this route. It was concluded that cost was not the issue. The issue was that, the Mararoa River/ Mavora Road sections are not suitable or compatible as a cycling experience for a grade 1 cycle trail.

Conclusion

The issue of the cycle trail route following the Mararoa River/ Mavora Lakes Road has been looked into and reviewed three times. This route was identified in 2007 and it was determined at this route would not be suitable as a section of the Around the Mountains Cycle Trail.

- a. Longer distance of days cycle ride by 3 km +.
- b. Would be a dusty unpleasant experience for cyclists in the summer months where the section of trail that would run parallel to the Mavora Lakes Road, 8 km to 10km. Up to 2 km of the trail could be developed alongside a creek within Landcorp Framing. However this option would still require 8 km of cycle trail to be developed on the road side grass verge. This section of cycle trail would not be compatible as part of a grade 1 cycle trail.
- c. Overall not of the quality vista from a cyclists experience as cycling through the Eyre Mountain Conservation Park.
- d. Not compatible with a specifications for a grade 1 cycle trail.
- e. Easements would be more intrusive to Landcorp farming than the option of the cycle trail route going through the DOC Eyre Mountains Conservation Park and then an easement along the edge of Landcorp.
- f. The public would not like the cycling experience of cycling along the Mararoa River/ Mavora Road as the cycle trail route in comparison to riding through the Eyre Mountains Conservation Park which will be one of the best days cycle ride on a grade 1 cycle trail anywhere in New Zealand.

4.6 Alternative Route-Option B

Option B was initially identified as the route through the Eyre Mountains Conservation Park. Following consultation with Fishing Game Southland and Landcorp Farming, both organisations expressed concern about the construction of a suspension bridge at the Three Kings location. The location is close to the fishermen's car park and is a favorite fishing site. Following on from this consultation the current route was developed as the preferred option (keeping the cycle trail on the left of the river).

Issues Option B

- This option would require 2 additional suspension bridges crossing the Oreti River and 5 smaller bridges.
- A suspension bridge at Three Kings would be immediately over the top of a favourite fishing location
- the true
- A suspension bridge at Three Kings would impact on the significant natural landscape
- Option B would have a larger impact on Landcorp Farming than the preferred option
- Option B suspension bridge would still require approximately 194 m of rock protection to protect right suspension bridge foundations.

4.7 Cantilevered Boardwalk

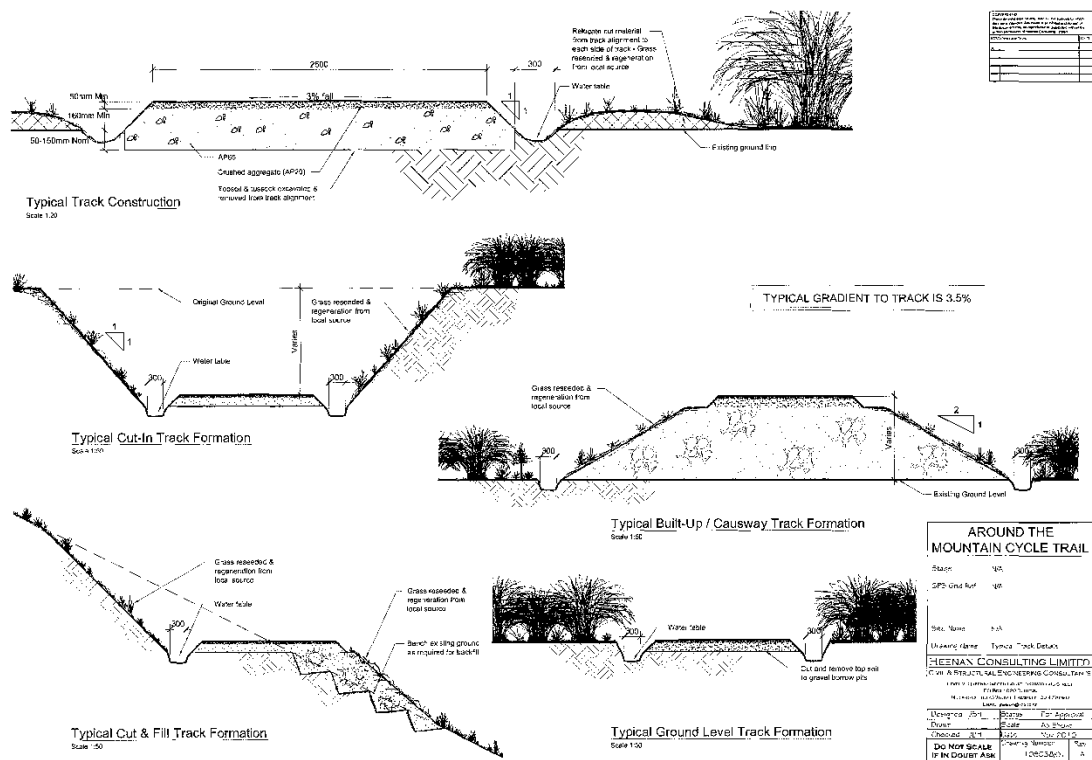
The Draft MWH route options recommended three cantilevered boardwalks around rock faces. In consultation with Fish and Game Southland it was identified that the boardwalks would be over the river, usually where there were good fishing opportunities. To mitigate these effects alternative route options were explored and developed moving the cycle trail further away from the river at these locations.

5. Cycle Trail Construction Methods

The cycle trail construction methods will vary depending on the surface conditions, trail gradient and forested areas.

5.1 Trail profile

Five cycle trail profiles are illustrated, it is anticipated these profiles will cover all types of conditions encountered on the cycle trail. Placement of rock protection within the river for a total of 360m and in one location the cycle trail to be constructed on top of the rock protection.



5.2 Rock Protection

Rock protection profile in the Oreti River illustrates placement of rock protection within the river to protect river bank from the erosion. It is anticipated rock will be transported from the Environment Southland Rock Quarry at Mossburn to the Westen side (True Left of river bank) and placed in the river by large excavator. It is not anticipated transporting any protection rock across the river by way of lorries or moxie trucks. It is anticipated using a large excavator sitting in the edge of the river and the excavator placing a rock on the other side of the river. There is a total of 360 lm of rock protection required refer page 24 to25 maps.

No culverts will be constructed over 1 m in diameter, water flow requiring more than 1 m in diameter culverts will have clear span bridges to mitigate the effect of altering the water channel for fish migrating and spawning.

All bridges within the Eyre Mountains Conservation Park will be clear span across the waterway so as to mitigate the effects of bridge piles within the smaller streams and Oreti River.

Surface Water

Surface water will be directed through a large number of small culverts which will be installed to allow the natural flow of surface water to pass under the track and disburse in its natural environ. This is to ensure that the cycle trail does not cause surface water degradation flowing into the Oreti River.

5.4 Gravel Extraction Sources

As the track will be predominantly surfaced in crushed gravel, a source for that gravel is required. The sources should preferably be local to avoid transport costs over large distances. Outside of the Eyre Mountains Conservation Park the cycle trail will predominantly use existing gravel extraction sites.

There are 14 gravel extraction sites which have been identified within the 30 km Department of Conservation Eyre Mountains Conservation Park. Some of these gravel extraction sites may not be utilised. A large number of gravel extraction sites mean there will be less travel by trucks developing the cycle trail. Also having numerous gravel extraction sites will mitigate the effect of leaving large extraction pits on completion of the cycle trail.

6 Track Maintenance

It is expected that there will be ongoing track maintenance, after the initial track clearing, formation and development. It will be necessary to carry out annual weed spraying of the track surface and preventative measures to ensure the eradication of noxious weeds such as gorse and broom. These types of plants will begin to encroach on the track from adjacent land.

After storm conditions, there will be a need to make storm repairs to both the track surface and the clearing of any debris left on the track from broken tree branches or fallen trees. Track washouts, scouring or surface damage will require repair or redressing to provide a suitable surface again.

As the formed track begins to 'bed down' from cyclist use, there will be areas that need to be addressed due to soft conditions, drainage issues or settlement. Short lengths of patch metalling of these areas will reinstate the track back to the desired surface.

7 Access and Car Parking

The following access to the trail and car parking provisions are proposed:

- Mt Nicholas Road (Oreti River Bridge) – a metalled parking area is proposed at the entrance to the DOC conservation area on the north side of the bridge to accommodate 13-15 vehicles.
- Mossburn – parking is available at Mossburn close to the trail, particularly in the vicinity of the sports domain.
- Lumsden – generous existing parking is available in the central area of Lumsden township.
- Five Rivers – near Point 339, a metalled parking area is proposed at the entrance to the Drummond property and adjoining the rail corridor on the north side of Five Rivers Road to accommodate 13-15 vehicles.
- Athol – adequate parking is available adjacent to the shops in the main street of Athol. This is connected by a short length of Riverview Road to the cycle trail.
- Garston – adequate parking is available along the sides of the Council reserve (through which the trail passes) and along the church frontage in the central part of town.
- Kingston – the treatment of the terminal facilities refer: page 103 maps Start / Finish Cycle Trail.

A typical car parking area of 350m² has been allowed for in the estimates. This will provide a gravel surface parking area for 13-15 cars and includes an 8.0m length of access road.

8 Roads

8.1 Crossing Points

The cycle trail will cross several roads. To ensure that cyclists approach these with appropriate speed and awareness for traffic on the road, most of them will need some treatment.

Treatments

Refer **Appendix 10: Cycle Trail Design Guide, Section 5 page 42 Crossing and Intersections.**

Highway Crossings

The proposed trail includes 6 crossings either on State Highway 6 or State Highway 97 and State Highway 94 as listed below. At these crossing it is proposed to install terminal treatments and warning signs.

- Mossburn Lumsden / SH 94 at Southland Road page 55 maps.
- Mossburn Five Rivers Rd / SH 97 Five Rivers page 71 maps.
- Athol Five Rivers Highway / SH 6 page 81 to 82 maps.
- Garston Athol Highway / SH 6 (east of Athol, page 87 maps.
- Garston Athol Highway / SH 6 (halfway between Athol and Garston, page 90 maps.
- Garston Athol Highway / SH 6 (just north of Garston, where The Terrace meets SH 6, page 93 maps.

9 Preliminary Safety Assessment & Recommendations

Prepared by Rochelle Leach, Roding Engineer, Southland District Council.
Professional Support by Jane Ballantyne, Road Safety Co-ordinator, Road Safety Southland.

At the request of Wayne Heerdegen and Mike Barnett a review of the proposed 'Around the Mountain Cycle Trail' was undertaken by myself, Rochelle Leach Roding Engineer (Southland District Council), and Jane Ballantyne, Road Safety Southland Co-ordinator.

Our scope was to review the proposed cycle trail from a road safety perspective, for both cyclist and other road users, and recommend possible solutions.

A site visit was undertaken by Jane, myself and Mike Barnett (Project Manager) on Friday 11th February 2011; which included a drive-thru from Mossburn to Walter Peak Station via SH94, Centre Hill Rd, Mavora Lakes Rd, Von Rd and Mt Nicolas Rd.

Overall it was noted that much of the cycle trail will be off road or on shared user roads such as Mount Nicholas Rd the traffic volume is very low (2010 estimated ADT count of 20). We also felt that in general, rather than over populate the route unnecessarily with signage it would be preferable to focus on any identified conflict points and potential hazards.

Recommendations:

Walter Peak Station – as it is anticipated that this will be the starting point of cyclist exiting the wharf it is recommended **THAT a National Cycleway sign be erected**, which includes notices for cyclist on Safe Cycling behaviour, such as stay left, helmets to be worn, single file when sharing road and on corners, etc.

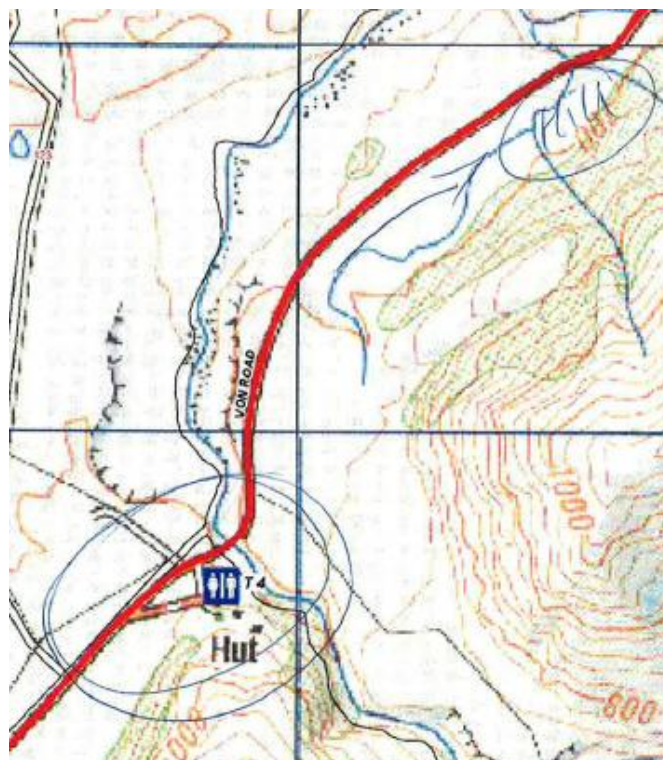
- This sign is to be developed by applicant and preapproved by Rochelle Leach and Jane Ballantyne.

Cattle Stops on Mt Nicholas Rd and Von Rd – many of the existing cattle stops had poorly formed approaches with hazardous potholes for cyclists. **THAT the cattle stops be well formed and compacted**, as maintenance grading would not include the area in immediate vicinity of structure.

Ford Crossings on Mt Nicholas Rd and Von Rd – **THAT Detour signs are to be erected at Ford crossings where alternatives are available.**



Bond Hill – it was identified that there were two major issues with Bond Hill that would need to be addressed:

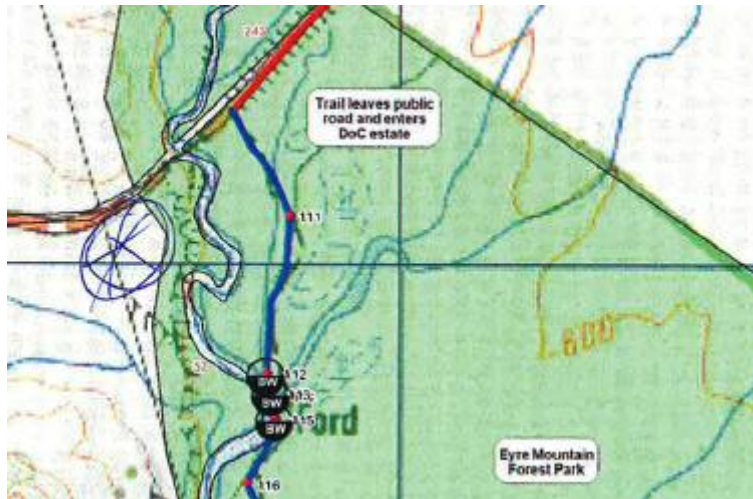


1. Proposed facilities, including toilets, café & bus stop, at the base of Bond Hill is a potential conflict area where multiple users will gather. It is recommended **THAT advanced warning signs be erected on approach from both directions of Cyclists Crossing and Share the Road**, and **THAT a information sign similar to that being developed for Walter Peak Station be erected prior to the exit of car park.**

2. **THAT a Steep Grade sign be erected**, similar to that used for Heavy Vehicles, at the

base and top of Von Hill to warn cyclists of the grade and potential fall hazard.

Public Road Use - where the cyclists are transitioning from the cycle trail onto public roads, such as at Oreti River on Mt Nicholas Rd below proposed accommodation units, **THAT Share the Road signs be erected to assist cyclists in identifying when they are exiting the cycle trail and entering public roads.**



Crossing Locations – where the cycle trail intersects with public roads it is recommended **THAT Caution Cyclists or similar be erected on the public road.**

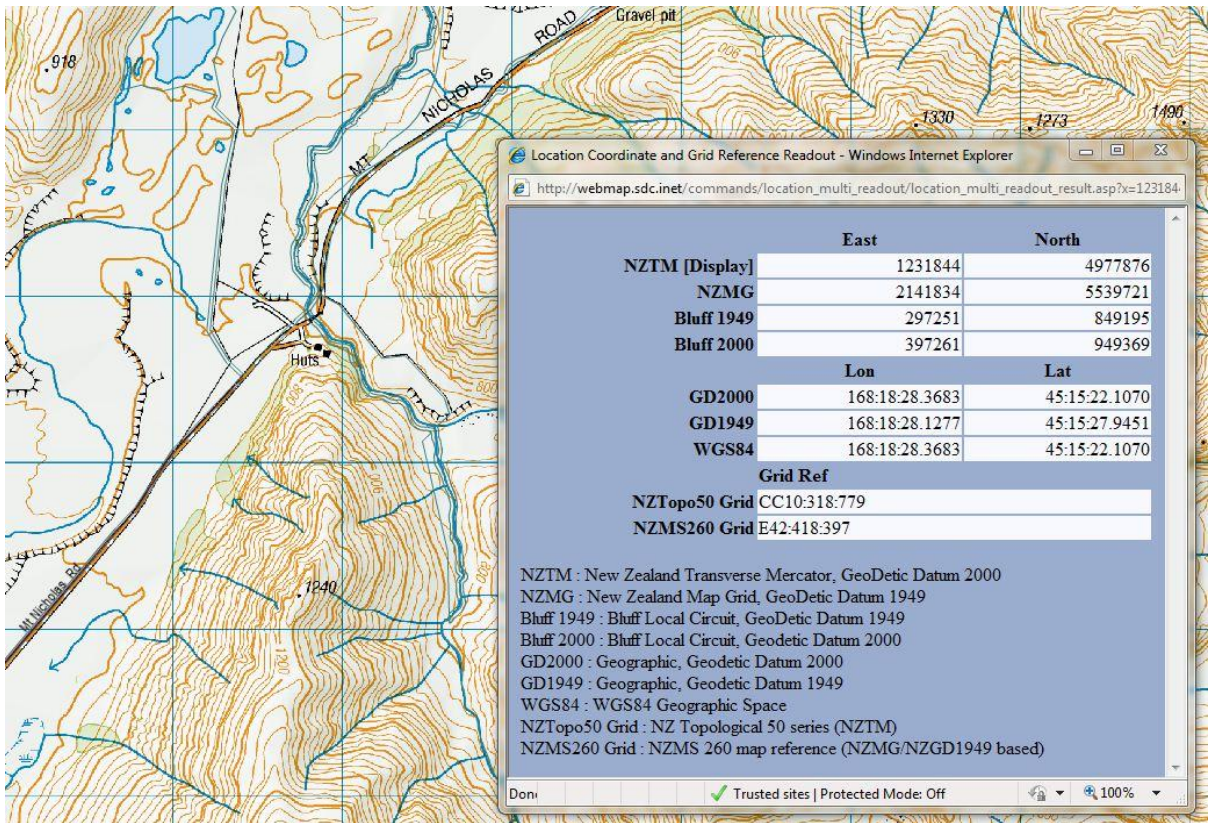
Single Lane Bridge on Mount Nicholas Rd – it was identified that there are 2 existing single lane bridges on Mt Nicholas Rd (Bridge A and Bridge B for the purposes of this report, map and location details are included in Appendix) with unprotected sides and therefore potential fall hazards. The nature of the restricted approaches on Bridge A meant that we felt it was a lower risk to a cyclist. Bridge B however has straight unrestricted approaches with gradients that would increase cyclist speed, additionally the fall height and terrain were considered of greater risk for serious injury. However it was also recognised that this road needs to service the existing landowners/users, which use over width heavy farm machinery and therefore the installation of standard bridge railing would be impractical. It is recommended **THAT investigation be undertaken to look at alternative solutions to the protection of cyclists from fall hazard when crossing bridge B.**

Advise Notes

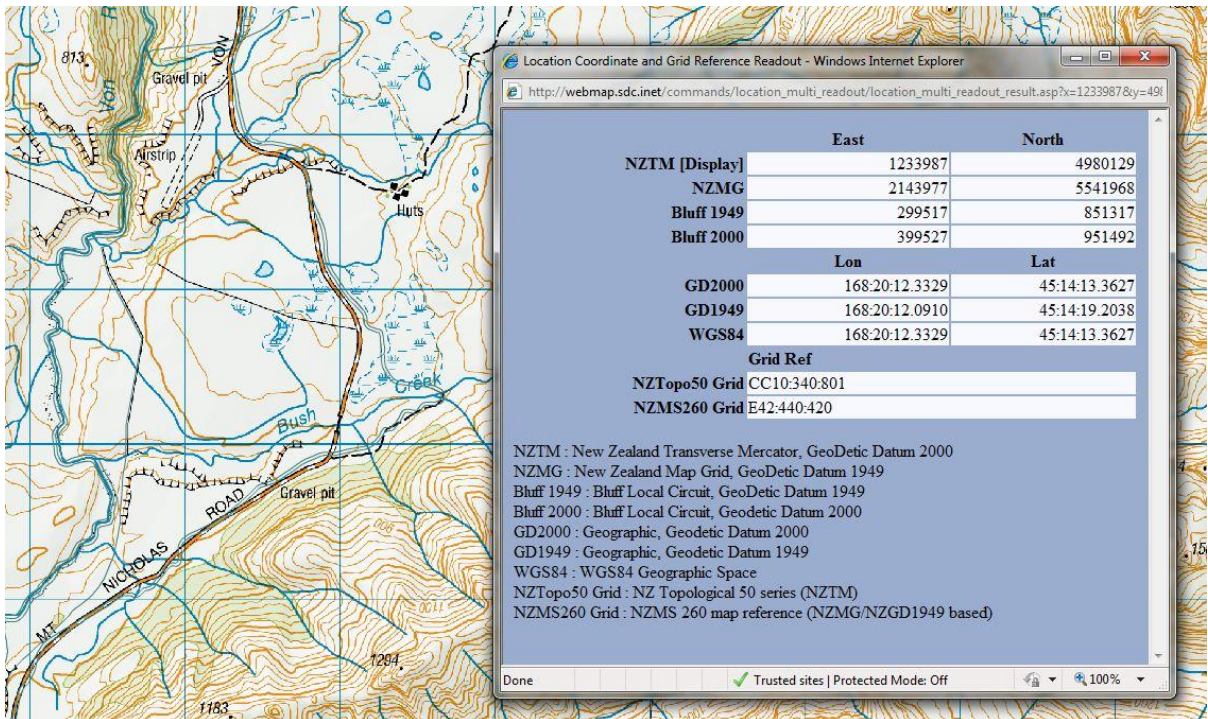
- There is a large amount of roaming stock, cattle and sheep, within the Mount Nicholas area. It would be advisable to include information on behaviour/best practise in material supplied to cyclist. While the stock appears very tame and well tempered, members of the public inexperienced with stock may get startled.
- The material and surface finish of the cycle trail should be consistent and of suitable material for the safe travel of cyclists and it is recommended that this be considered by the Project Manager and tenderers when pricing construction. For example, it would be difficult for cyclists to safely transition from a large boney rock material onto a smooth surface where the sub base has been exposed due to lack of grading, and then again onto a pebbly fine material that 'sucks' the wheels in.
- Co-ordination should be sought between the project planners and adjoining Road Controlling Authorities to ascertain if there are any planned minor improvements that could be conducive to both projects, for example Mike Barnett raised concerns over motorists reacting to cyclists travelling along trail beside road at the Mossburn Corner (SH94). It was noted that this corner has had a number of fatal and/or injury crashes in last 10 years and is already being considered for improvement by RCA. It would be practical to consider improving this corner by installing wire rope barriers to improve safety to both roaduser and cyclist.

This report is not inclusive of all potential safety issues for the cycle trail nor is it a schedule of the required signs. Rather it should be used as a guide for a standardised approach to the length of the proposed National Cycleway throughout Southland.

APPENDIX



Bridge A



Bridge B



View North



View South



Unprotected Sides



Approx 5m f

10 Signage

At this stage, no detailed schedule of signs nor costing has been determined. When determining signage, the following criteria would be used:

Signs would be required for:

- Identifying the start of the trail
- Directions to off-trail facilities such as toilets, huts or carparks
- Directions when the trail changes direction or changes terrain sharply (eg cross-country trail joins road for short distance and then resumes)
- Road crossings
- Warning and cautions about the trail or features (eg slip prone area; narrow, winding trail; single file track or structure)
- Occasional route markers (especially in remote areas) to advise riders that they are still on the trail
- Town names and features/facilities within the towns (cafes, toilets etc)
- Advance information signage (such as “next toilet – 11 km”)

11 Conclusions and Recommendations

Ultimately, the Around the Mountain cycle trail – track elements are a feasible engineering proposition and, in most locations, are not particularly challenging. The issue which is more challenging than most is the construction of the trail through the DOC estate, and developing a construction approach to minimise environmental damage and costs.

Cycle Trail Construction Conditions

No absolute list of qualities regarding contactors but in general terms there are two classes of information

1. Price attributes - everything around their pricing proposal
2. Non price attributes - everything around performance characteristics

Items in non price attributes generally include:

1. Health & Safety. This is mandatory under the HSE Act as in any commercial contract, the Principal (you) is equally culpable as the contractor in the event of an accident. The Principal must ensure that the contractor is taking "all reasonable steps" to manage risk in the work place. This includes staff training for the work in question, safety, gear, reporting accidents and follow up etc. HSE is a major item that tenders sometimes fail on but it is essential that your contractors display mature "buy in" at all levels of the company or you are exposed yourself in the event of an accident. H&S performance needs to be monitored during the course of the contract
2. Experience
3. Resources. Staff (skills, training for the job, eg do they have NZQA tickets for chainsaw work?) and plant
4. Timing, availability, completion dates
5. Anything else you may deem important.

In the tender documents, to disclose what the non price attributes are that will be used for assessing the tenders against, so that contractors can include the requested detail.

Construction Conditions Eyre Mountains

Trail to be constructed in 4 sections to mitigate unnecessary transport through tributary streams

- | | |
|-----------|--|
| Section 1 | Oreti River Bridge to Ashton Burn |
| Section 2 | Ashton Burn to Suspension Bridge point 200 just past Three Kings |
| Section 3 | Three Kings Suspension Bridge to Oreti River Suspension Bridge |
| Section 4 | Oreti River Suspension Bridge to South Boundary of Landcorp |

No rock protection construction work to be carried out because of endangered birds breeding on the river bed before 1 December, unless there are no birds breeding in the area.

Department of Conservation to mark out cycle trail through forest, cycle trail to be planned so mature trees are not removed.

All gravel extraction sites to be reclaimed/ landscape upon completion of the trail.