



Mangawhai Cycleway Connection

Route Scoping Project – Results Report
May 2017



Contact Details

Name: Bob Szrot

Opus International Consultants Ltd
Whangarei Office
Mansfield Terrace Service Lane, 125A Bank St
PO Box 553, Whangarei 0140
New Zealand

Telephone: +64 9 430 1700
Mobile: +64 27 540 2916

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Prepared by:

Bob Szrot, Water Group Manager

Name | Title

Reviewed by:

Peter Kortegast, Transportation Engineer

Name | Title

Approved for Release by:

Bob Szrot, Water Group Manager

Name | Title

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1. Introduction

The Mangawhai Town Plan upgrade identified the requirement to implement a Cycle/Walking network from Mangawhai Heads to the Mangawhai Village using alternate off road routes to provide quick, easy, and safe routes for Mangawhai residents and visitors.

While such a route had been identified at a concept level, there was a requirement to provide more information, investigation, and assessment to assist in the discussion of these potential alignments.

This Route Scoping Project commissioned Opus to provide preliminary scoping information through this document for the identification and cost estimating of these off road Cycle/Walking trails and inter-connections within Mangawhai Township, in the Kaipara District, see Figure 1 below.

Mangawhai is a rapidly growing area with several large subdivisions underway. The Population forecast will see the existing 3,000 resident community more than triple to a forecast 2027 population of close 10,000 residents.



Figure 1 : Location of Project

With residential developers able to provide valuable healthy life-style amenities to both residents and the overall community, recreational cycle/walking trails make sense to provide safe off road interconnections available to all levels of riders and walkers. Trails accessible to toddlers and parents, as well as seniors and mobility scooters.

Some trails are already being scoped and developed by different community groups and residential developments, so there is a present need to have a clear vision on how to interconnect these trails for an effective network of routes.

We also acknowledge that there are separate discussions outside of this report for roadside national trail links as throughways for more long distance cyclists.

2. Project Scope

Opus was asked to provide options on how to connect existing Council right-of-way's, paper roads, and trails as well as to upgrade some existing sections of trails to suitable minimum standards.

This commission accomplished:

- A review of the background information surrounding the Mangawhai community environment.
- A review of the marked up drawings as provided by MWH as part of the "Transportation" work stream for the Mangawhai Town Plan.
- A review of the marked up GIS drawings as produced by KDC to show the alignment concept of the proposed cycleway.
- Providing KDC with this formalised report examining a proposed network through:
 - Summarising and exhibiting the proposed routes segments and network – Route Finding.
 - Typical designs of cycleway/walkway construction – Trail Elements.
 - Unknowns and Risks.
 - Potential Funding Sources.

To assist in understanding the bigger picture, an aerial exhibit was produced for clarity. Please see Appendix A: Project Overview of Public and Private Routes.

3. Route Finding

Opus was presented with several plan drawings showing future housing developments, public road systems, paper road boundaries, and a potential estuary crossing opportunity. Our scoping started at Old Waipu Road and Molesworth Drive and proceeded as follows:



Figure 2: Old Waipu Road

- 1) **Old Waipu Road** at Molesworth Drive would serve as the point of origin to start this scoping exercise.

As the majority of this alignment presently having existing sidewalk, this section could be upgraded with a wider concrete pathway or as a bike lane within a widened roadway section.

The northern end of Old Waipu Road the pathway terminates about 500 metres short of the right hand entrance to Estuary Estates housing development.

KDC has expressed preference for separated, shared Cycle/Walking paths.



Figure 3: Old Waipu Pathway



Figure 4: North end of Old Waipu Road

- 2) Proceeding from Old Waipu Road, the trail route now crosses the road to the right and enters the gateway of the proposed **Estuary Estates Subdivision**. Consideration here would be for a marked formal pedestrian crossing across Old Waipu Road.

A shared Cycleway/Walkway link through the subdivision would make use of the development's proposed parks, playgrounds, other private internal trails.



Figure 5: Entrance to Estuary Estates

In addition, the development's planned village centre with an on-site shopping centre and village shops could serve as a destination location for both residents and the community at large.



Figure 6: Entrance to Estuary Estates



Figure 7: Internal Private Route - Estuary Estates

A concept design of this development was overlaid in Appendix A: Project Overview of Public and Private Routes and presented below in Figure 7 to show additional internal planned trail ways.



Figure 8: Estuary Estate Concept Plan



Figure 9: Estuary E2 Route at Molesworth

3) On the western side of the Tara Creek Estuary at Molesworth Bridge is another access point for the cycle/walking network.

This route is designated as **Estuary E2** and progresses northward along the western banks of Tara creek to the potential jump off point for a boardwalk connection and two bridges - see Figure 10 below.



Figure 10: Estuary E2 Northward

This link now crosses the Tara Creek Estuary from Estuary Estates to a peninsula of Council owned land that continues straight towards the existing gravel surfaced Thelma Road

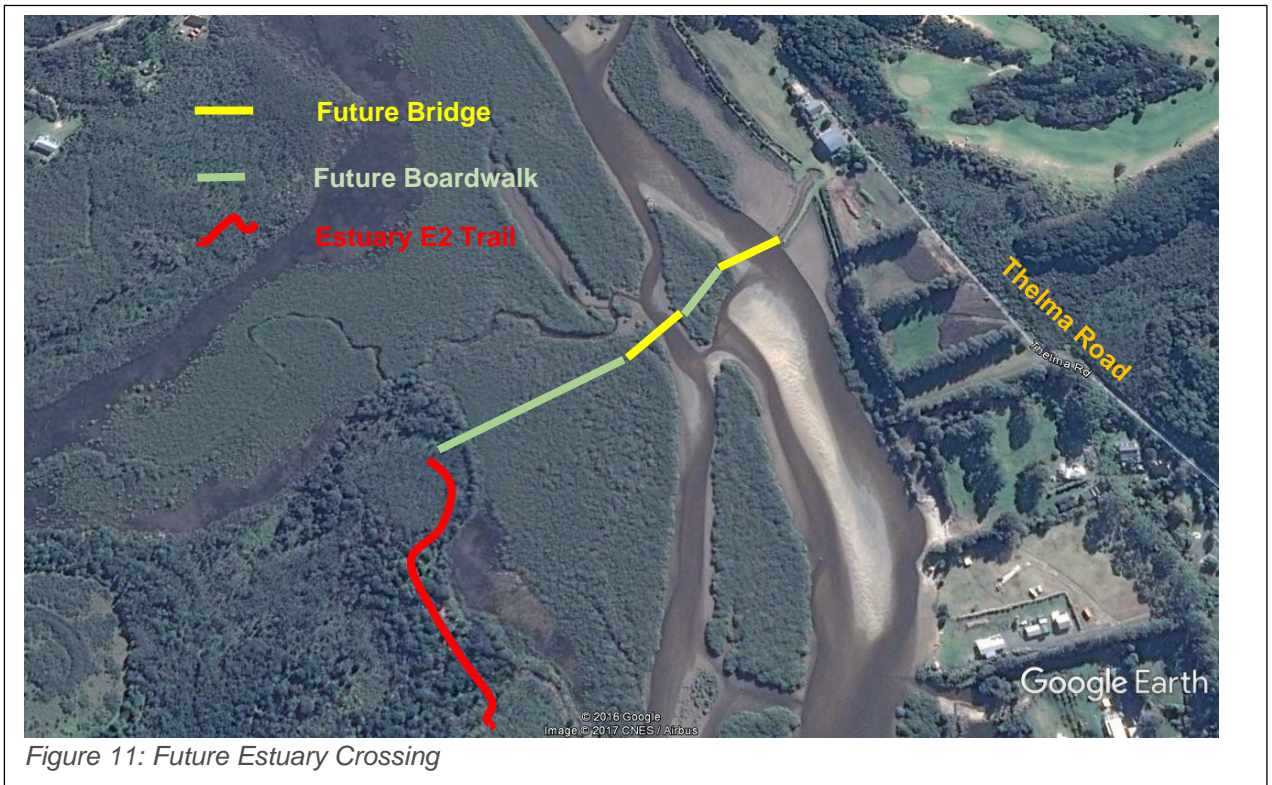


Figure 11: Future Estuary Crossing

- 4) After crossing the estuary and standing on the peninsula, if one looks left or northward, they will see a pathway of Council owned land called the Esplanade – Figure 12.

This route proceeds northward and turns right into a trail way that was established by the installation of the utility **Riser** main.



Figure 12: Esplanade



Figure 13: Riser Main Route

The Riser route runs just outside the western boundary of the golf course and creates the northern connection to several more developments: Northcoast and Park Lands.

Looking at Appendix A: Project Overview of Public and Private Routes shows the Riser trail allowing the cyclist/walker to choose three different directions – see Figure 14.

The traveller then has the choice to proceed:

- East through the Northcoast Development roads and trails, and eventually to Mangawhai Heads through the Northcoast gateway on Molesworth Drive – Figure 15.
- North to Parklands Avenue on public roadways.
- West towards the boat launching area off of Jack Boyd Drive on public roads and trail through developments, see Figure 16.



Figure 14: Riser link



*Figure 15: Northcoast Development
Molesworth Gateway*



Figure 16: Public Boat Launch Area on Tara Creek

4. Trail Elements

4.1. Board Walk across the Tara Creek Estuary

It is recommended to consider a timber board walk as the preferred solution to provide a cycle and pedestrian crossing across the estuary. It is estimated that this would be a total length of 200 to 250m, with two water spans of 70m each across the main channels requiring Bridge sections. We have attached a typical board walk detail from the Great Taste Trail and photographs of similar facilities in Tauranga and Tasman.

Requirements/ Cost Rates:

- Post spacing every 2.5m (Can be widened with use of larger beams)
- Typical cost rates without handrails \$600 to \$1,100/m (using volunteer labour to place and nail decking)
- Typical rates with handrails \$900 to \$1,500/m (using volunteer labour)

Therefore if we consider using volunteer labour and excluding consenting and professional fees the typical cost of the boardwalk connection would be \$275,000, with no risk allowance.

This rate is based on having suitable foundation material across the estuary. If material is weak this cost could require much longer piles and cause a 40% cost increase. It is recommended to undertake a few test pile drives in the Estuary to test the insitu material.



Figure 17: Tauranga City Estuary Board walk 1m above estuary level 2m wide.



Figure 18: Great Taste Trail Tasman, Estuary Board walk with hand rails, 2.8m wide.

Boardwalk Diagram x1 A3s

Boardwalk Diagram x2 A3s

4.1. Tara Creek Estuary Bridges

There are two possibilities for crossing the two main channels of the Tara Creek Estuary.

If height above channel is not a critical consideration, then boardwalk sections could be installed with handrails.

However, in discussions with local residents, we were informed that power boats utilize this estuary, both from the Molesworth Drive Bridge and the Jack Boyd public boat launch facility.

We recommend that if boat traffic is to be accommodated, then one or two bridge structure should be installed. The above water height could mirror that of the Molesworth Drive Bridge as it would seem impractical to launch a taller boat for exclusive use in the estuary.

Discussions with bridge manufacturers suggests a stainless steel structure priced at \$5,000 per meter. The manufacturer would accomplish additional geological testing and design, as well as installation.

As more site specific soil testing would be required before design, a risk factor of 30% could potentially be added to these costs.

4.2. Existing Track Formation

A design cross section of 2.5m gravel path is proposed. This should be finished in a gravel surface, with sufficient fines to bind material together. Most recreational trails use low cost quarry over burden material, with a good mixture of fines, with a depth of 100mm. It is usual to scope this from local supplier and trial a section and see how it compacts down. An option is to establish a local crusher if material can be won onsite.

The construction process is:

- Peg path route
- Cut back vegetation to a 3.5m path. (0.5m back each side of 2.5m wide path)
- Cut path platform with sidling cut and fill if required
- Strip top 100mm of ground cover top soil and set to side of path. (lose on site)
- Weed stray path and edges
- Run in 100mm of granular material
- Compact.
- Form water tables in any cuttings or on steep grades but usually rely on natural soakage. Will need culverts for all small water courses or small streams. These should be sized for larger channels, but not smaller than 375mm of a sufficient strength to allow maintenance vehicles.

Typical construction cost for paths is \$20/m, assuming vegetation cutting and soil can be lost onsite, no fencing and minimal earthworks, excludes drainage. This rate is based on a \$30 m³ gravel supply rate. If local rates are higher or transport cost higher then this rate will need to be factored up. Allow for a culvert every 20m at \$650 per culvert.



Figure 19: Great Taste Trail Nelson

For the Riser Path it is suggested that the approach would be to clear vegetation back to 3.5m corridor, spray path, form water tables of steep sections, install culverts at key points and run in 100mm of base material.

Estimated cost for riser path is \$45/m, including drainage, as this section would be vulnerable to water scour.

5. Project Unknowns and Risks

As this report is preliminary with limited site knowledge and geotechnical investigations. The existing risk are:

- Underground services relocations if necessary
- Peak flood flows and clearance of Mangawhai River Estuary. Assume Tidal variance is 1 to 1.5m
- No underground geotechnical information for pile depth for boardwalk
- Land accesses or fencing requirements
- No knowledge of Resource Management Act restrictions or consent requirements
- No knowledge of local environmental requirements
- No safety in design has been undertaken

6. Project Financial Estimates

A summary of existing route sections and their respective costs are as follows:

Section	Element	Approximate Length – metres	Unit Cost *	Element Total
Old Waipu	2.8m Sidewalk Path	1,000	\$250	\$250,000
Estuary Estates	Metal Path	2,000	\$ 20	\$40,000
Estuary E2	Metal Path	1,200	\$ 20	\$24,000
Tara Creek Estuary	Boardwalk	250	\$1,200	\$300,000
	Bridges	2 x 70 = 140	\$350,000 ea.	\$700,000
Thelma Road South	Metal Path	1,100	\$ 20	\$22,000
Riser	Metal Base	1,300	\$ 45	\$58,500
North Coast	Metal Path	1,300	\$ 20	\$26,000
Parklands	Metal Path	750	\$ 20	\$15,000
Jack Boyd	Metal Path	1,800	\$ 20	\$36,000
	Culverts every 20 metres	300 ea.	\$ 650	\$195,000
		10,700m	Total Network Cost Estimate	\$1,616,500

* 40% Risk factor may be applicable

7. Project Financial Assistance Options

The development of recreational cycle trails or peri-urban cycle trails can be attract financial assistance from different areas. The typical sources of financial assistance are:

- Local Authority community recreational facility capital funding
- Developer funding as mitigation for impact of traffic as part of resource consent conditions
- Community Reserve fund contributions from developments or subdivisions.
- Community Groups supports via donation of labour, materials and local expertise.
- Lotteries or other environmental or community facility funders, who would support a trails trust who would need to be established. Most trails are managed by community trusts who are supported by local Councils and other funders.
- Service suppliers. It is possible that you could attract sponsorship for board walk and paths from a fibre optic or communication company to run ducts under the boardwalk and cycle ways.
- New Zealand Transport Agency Urban Cycle Fund (P&I) support at local FAR rate. This would require an application under the urban cycle fund for support and recognition that these paths provide urban cycle facilities for the interested but concerned user and it meets a per-urban cycle facility criteria.
- New Zealand Transport Agency Cycle Improvements capital programme (P&I) support at local FAR rate. This would require a submission as part of annual transport programme and justification as a business case that the paths improve road safety and provide for commuter cycle safety and prevent potential crashes or safety risk on Molesworth Drive.

APPENDIX A

PROJECT OVERVIEW OF PUBLIC AND PRIVATE ROUTES

APPENDIX B

MANUAL CONE PENETROMETER TEST REPORT



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