Project Number: 1-11255.00

Waipu to Marsden Cove Cycle Trail

Route Investigation and Design Report

Whangārei District Council

14 April 2022

CONFIDENTIAL

wsp

150 YEARS IN AOTEAROA

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1	Draft for client feedback
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Disclaimers and Limitations

This report **('Waipu to Marsden Cove Marina – Cycle Trail')** has been prepared by WSP exclusively for Whangārei District Council ('**Client**') in relation to the design and installation of a Cycle Trail from Waipu to Marsden Cove Marina. The findings in this Report are based on and are subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

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1 Executive Summary

Whangārei District Council is proposing to implement a cycle trail and shared user path (SUP) from the township of Waipu through to its termination at the Marsden Cove Marina.

The scope of this report covers the development of a cycle trail that can be constructed within the next 10-year period. This design would make use of existing infrastructure where possible, existing traffic bridges, roads, etc. to minimise the overall cost of the project start-up, allowing for public to access the route, with a lower level of service in the short term.

This will form the first phase of construction, allowing opportunity for further development and upgrades to infrastucture as demand increases. It is envisaged that the 'on-road' sections of the trail would be implemented through Council funding, allowing further development to continue 'off-road', which may be community-driven through local cycling trusts, with funding being obtained through alternative funding streams.

The future phase of works would include dedicated bridge crossings, upgrading existing roads, improved route alignment or additional connections to destinations and attractions. These works are only to be completed beyond the 10-year timeframe once demand has shown the need for safety improvements to the trail and funding availability.

Design drawings and estimates for physical works are provided for the first phase of the works based on the works being fully paid for by Council and delivered through an experienced civil construction contractor. This cost may be reduced by staging sections of the work with some of the work being carried out by community groups, where appropriate.

The implementation of the cycle trail will provide significant value to all users, both cyclists and pedestrians, as well as to the local community. Together with other proposed trails throughout Northland, this trail would form part of an integrated network with significant benefits Northland wide.

Strategic priorities are delivered through the Government Policy Statement (GPS) 2021 to enable government direction for transport infrastructure development. Providing 'better travel options' is one of the key priorities, with Waka Kotahi working together with the local government to deliver new walking and cycling projects. Another key priority is 'climate change' and supporting the reduced need to travel by car and increased use of public transport, walking and cycling. The objectives of the Waipu to Marsden Cove cycleway project align directly with these strategic priorities.

Figure 1: Waipu Town to Halifax Drive Shared Path

2 Introduction

2.1 Background

A trail from Waipu to Marsden Cove is proposed as a dedicated walking and cycling connection to cater for both recreational users and commuters. After the successful implementation of the Waipu Coastal Cycleway from Waipu Cove to the Town Centre, this trail will continue from here along the coastline providing connections to Ruakākā Beach, Ruakākā Town Centre, Marsden Point and Marsden Cove Marina.

The trail will provide connection to the greater inter-regional cycle trails, with the Matakana to Mangawhai cycle trail currently being implemented to the south and the future plan for the Whangārei to Marsden cycleway as part of the State Highway upgrades. With the growing demand for low-emission transport options, the cycle trial aligns with the government objectives for the future of transport infrastructure and will support the reduction in carbon-emitting transport. The trail will also enhance the current Te Araroa Trail that runs along this section of coastline, a 3000 km long walking trail from Cape Reinga to Bluff.

2.2 Twin Coast Discovery

The existing Twin Coast Discovery Route is an 880km road network of Northland which travels along the east coast from Whangārei, through Kawakawa and then on to SH10 through Kerikeri, before reconnecting with SH1 to Cape Reinga at the top of New Zealand. The route follows the picturesque coastline of both of Northland's east and west coasts as well as running through dense kauri forests, small Northland towns, vineyards and orchards.

The Twin Coast Discovery Route currently includes 80km of off-road cycle trails with the majority of this made up by the Pou Herenga Tai Trail, running from Kawakawa to Horeke. To fully develop an off-road trail around the Twin Coast Discovery Route requires the development of approximately 700km's (see Figure 3) of off-road cycleway and a $103M investment.

There are currently 20,000 bikes per annum utilising the existing Pou Herenga Tai Trail,. With a more extensive network of off-road trails there is the potential for 100,000 cyclists per annum as evidenced by the successful Hauraki Cycle Trail.

The project strongly aligns with the wider Twin Coast Discovery Route Business Case 2017, which seeks to provide greater dispersal of visitors throughout the region and throughout the year through improved transport infrastructure. This, overlapped with improved visitor infrastructure, seeks to create investment and employment opportunities throughout Northland. The economic benefit to Northland for the fully developed Twin Coast Cycleway network is 2% to 4% growth in GDP.

2.3 Northland Cycleway Implementation Plan

The Northland Cycleway Implementation Plan project seeks to develop approximately 140km (see Table 1) of off-road tracks, with an investment total of $19 million. The Plan demonstrates a program for building these trails to deliver a network that could be installed in prescribed stages, prioritising appropriate trails for early delivery. Each trail has been assessed against criteria based on strategic alignment, trail development and economic benefits. The following trails have been assessed as ready for early delivery:

Table 1: Routes Prioritised for First Stage of Delivery

Route	Length	Grade
Waitangi to Kerikeri	8km	Grade 2
Opua to Paihia Walkaway Opua to Paihia on-road cycle route via Aucks Road	6.8km 8km	Walking track Grade 4
Waoku Old Coach Road	53km	Grade 3-4
Kaihu Valley Rail Trail	41km	Grade 1-2
Langs Beach to Ruakākā	25km	Grade 1-2
Total	**140km**	

3 Project Benefit

3.1 Northland Cycling Plan

The regional vision for walking and cycling in Northland would see '*Northland as one of the world's best coastal walking and cycling destinations where the journeys and stories are as impressive and memorable as the scenery.*' The Northland Walking and Cycling Strategy (2018) highlights four strategic focus areas:

1 Developing appealing and cohesive walking and cycling networks that connect Northland;
2 Growing walking and cycling participation and promoting Northland's Coastal point of difference;
3 Improving community well-being, including creating economic opportunities; and
4 Ensuring walking and cycling infrastructure and its use is sustainable.

Through this strategy 13 cycle routes (see Figure 3) have been selected, which seek to achieve this vision. If the 5 projects proposed are implemented, then 30% of the 700km network will be off the road.

4 Design Philosophy Statement

4.1 Introduction

The experience of travelling through natural landscapes, interpreting, and articulating the experiences and sites along the way is the basis of narrative storytelling. This takes place at human pace and scale, originally through walking, with riding a bicycle being a modern equivalent.

Central to the success of a network of cycleways across Northland is making it legible and accessible as more than a place of pristine coastline and great forests, instead of a distinct cultural landscape with a long historical narrative that is still being written. Through understanding a place as more than meets the eye, a deeper appreciation, sense of commitment and stewardship develops. The Bream Bay coastal landscape is something of natural beauty that should be retained for future generations.

The Waipu to Marsden Cycleway Project will compound the accessibility of the natural coastal landscape of Bream Bay with the benefits of a cycle transport network to allow for commuting between town centres.

Part of the original vision of the Northland Walking and Cycling Strategy was a loop comprised of individual rides that circled Northland, loosely aligned with the Twin Coast Discovery Route. This is a compelling narrative. However, with a clearer understanding of each route's characteristics, the likely users and their ambitions and requirements, the combined trails are now conceptualised as more of a network, providing strong connections between communities and key destinations.

4.2 Design Considerations

Among the trails currently being developed as part of the Northland cycle network is a range of grades, from low grade 1 – 2 rides suitable for family groups and recreational riders through to grade 3-4 rides, which are suited to experienced mountain bikers. The Waipu to Marsden Cove trail alignment was considered as a trail that could be accessed by riders of all abilities and subsequently required a grade of 1 -2. The terrain along the alignment is generally flat, with gentle inclines that would qualify for this grade.

Design Philosophy and Intent – what is the vision for this trail?

Trail Specific Opportunities and Constraints – With a thorough understanding of the intent for this trail what opportunities and constraints specific to this trail have become apparent? How will this trail contribute to the overall network? How will it contribute to the local community and its economy?

Land Access and Risk - What area of the trail runs along private land? What consultation has been undertaken with these landowners? Are there any resource consent risks associated with the trail development? Risk is defined as:

Risk	Land Owner Status	Consenting Status
No	The route, and directly adjoining land, is owned by Council, or Crown.	No resource consent is required.
Low	Small % of private landowners adjoining route. Consultation undertaken.	Possibility of requiring resource consent, unlikely to be notified.
Medium	Some private landowners, evidence of encroachment into route location. Low	Resource Consent is required. Limited notification required.

	to moderate level consultation undertaken.	
High	High % of private landowners. No consultation was undertaken.	Resource consent is required. Public notification is required.

Leadership and Stakeholders – Does the trail have a clear leader to take it through the funding, construction and long-term maintenance processes? Have all stakeholders provided their support of the project?

Geotechnical Requirements – Rock and Soil type has been analysed on the route to determine where additional structures may be required to stabilise the land.

Design Assumptions – What factors and contextual considerations have been understood as influences on the design process and outcomes?

Design Geometry and NZCT Design Guide Criteria – What specific engineering characteristics will the trail have? These will contribute directly to the cycling experience.

Maintenance Implications and Requirements – Are there whole of life maintenance implications, to what extent and has consideration been given to who will bear these?

Funding Recommendations – What funding stream does this trail align with?

Developing cycling's contribution to the regional economy entails prioritising the trails to arrive at relatively "easy wins" which could be implemented as practicable. This is achieved through the MCA process elsewhere in this document. The overall goal is an integrated system of cycle trails, with each contributing to the success of the whole network

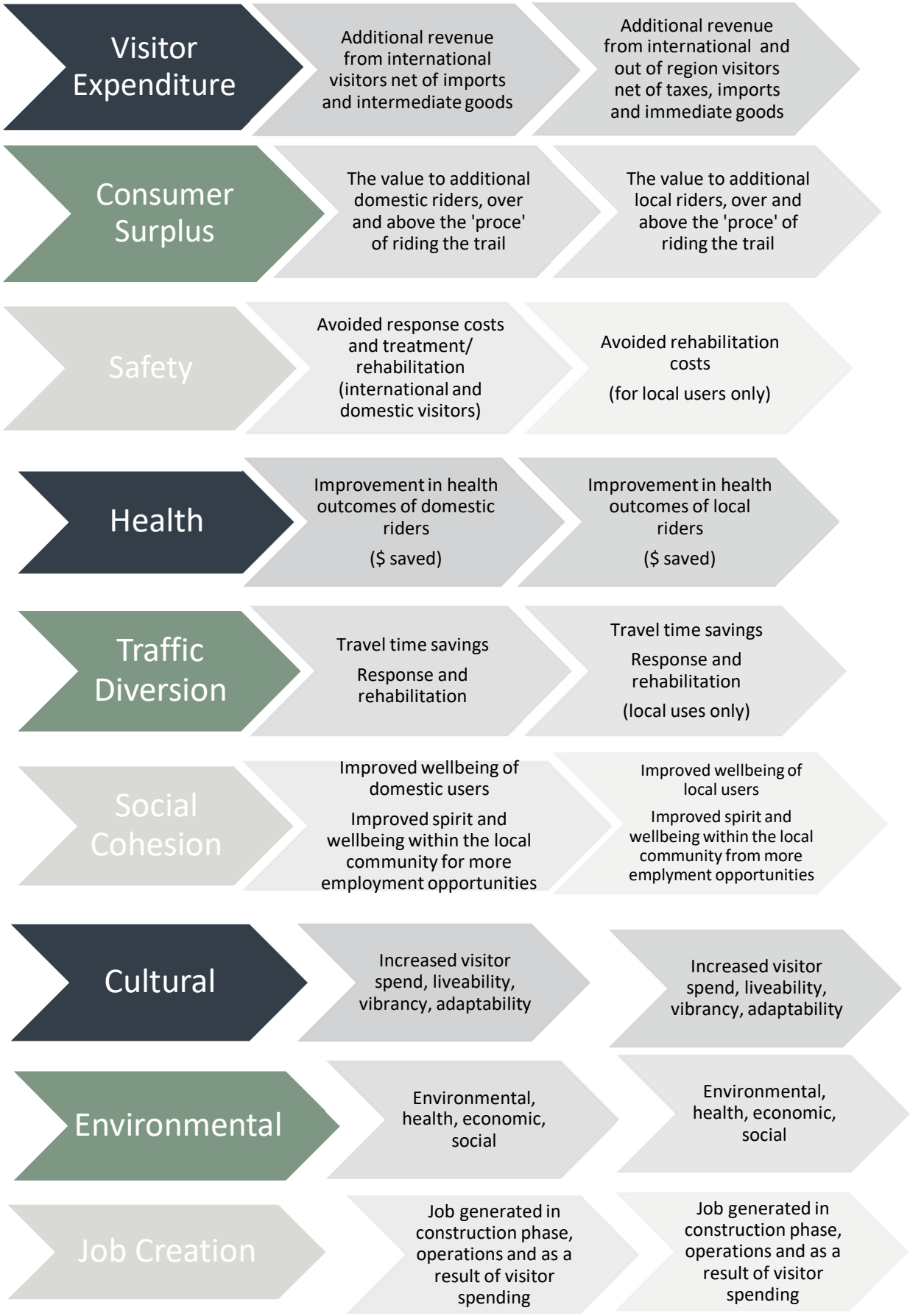


Figure 2:National and Regional Cycleway Benefits

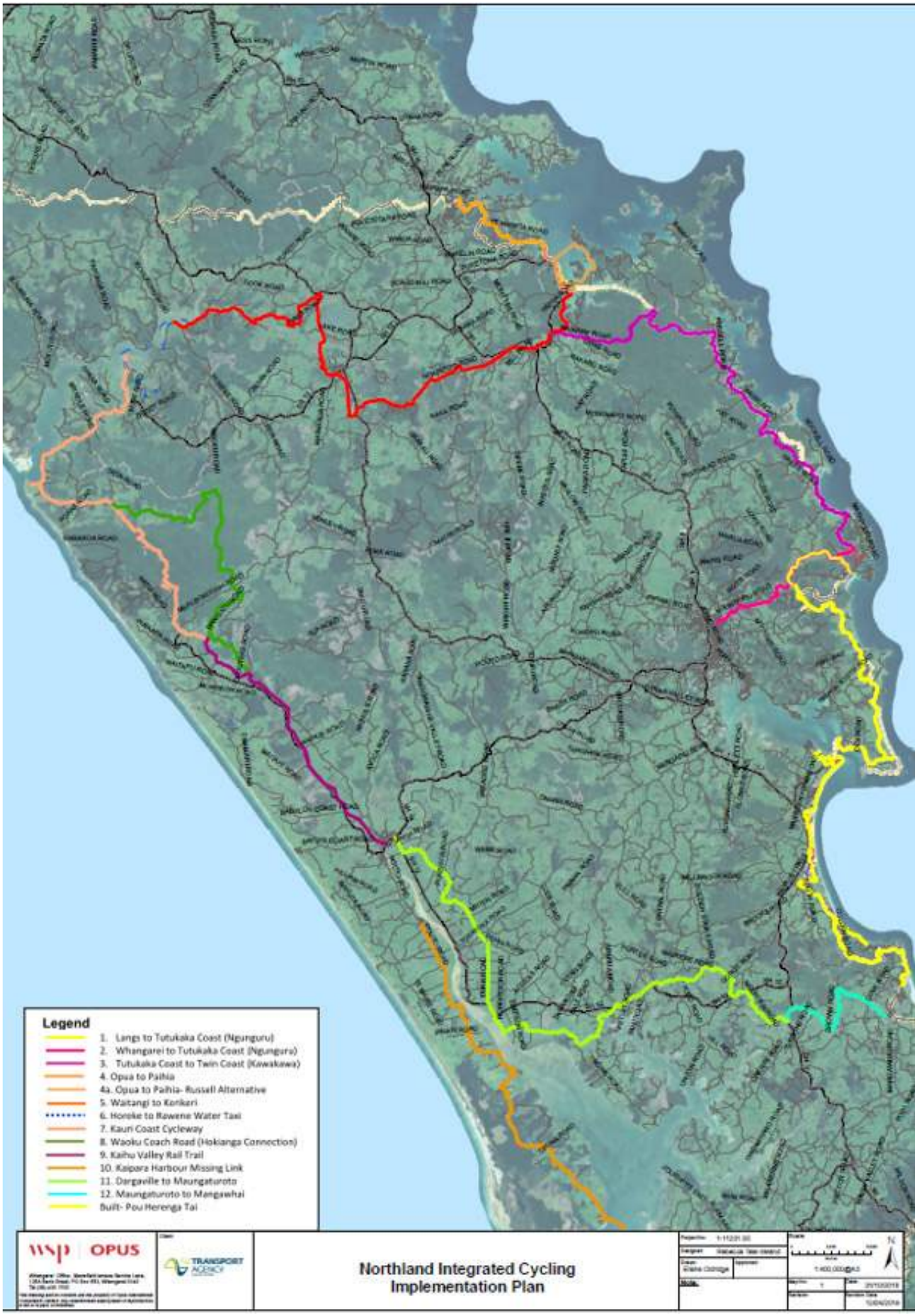


Figure 3: Proposed Northland Cycling Routes

5 Route Investigation

5.1 Desktop Study

A desktop study of the proposed route was undertaken prior to a full site walkover of the 25km length of the proposed cycle trail.

Property boundaries were located for the initial route investigation, with the aim of keeping the trail within the boundaries of local authority or crown owned land, to avoid the requirement for land acquisition or access agreements across privately owned land. There are route options identified that incorporate a trail through privately owned land, although alternative options exist and are recommended to avoid the additional cost associated with private landowner negotiations.

Future residential development of farmland adjoining the coastal trail may present Council with opportunities to incorporate improved cycleway conections into the developer's consent for subdivision.

Consideration into the placement of road crossings and 'shared use' space along roads was a key part of the initial route assessment to design a route that provides safety for all road users in the shared space. Ensuring sufficient sight distance at the locations of crossings was paramount.

5.2 Route Walkovers

The initial route was walked and 'go-pro' footage was captured for the length of trail. Obstructions such as river crossings, terrain type or physical barriers were assessed to determine a short-term route that could be implemented without significant impact on existing structures or the need to construct new structures.

6 Survey

6.1 Drone Survey

A fly-over survey has been completed for the length of the trail using a specialist UAV to obtain high resolution imagery and ground levels. A 60m wide strip aerial image along the proposed route was captured for use in determining the extent of formation works required.

The data collected assisted in the design for aligning the trail through areas with suitable grades allowing us to determine route options that would minimise earthworks for the formation of the trail.

Drone survey data has been processed into CAD drawings with chainages running from 0.000 at Waipu Town Centre to 22.974 at Marsden Cove Marina

6.2 Property Survey

Property boundary data has been utilised for developing the design drawings. Property boundaries have been obtained from the online LINZ data service. Property ownership details have been obtained from GRIP cadastral mapping.

In the assessment of route options, the locations of these boundaries are assumed to be of suitable accuracy for design purposes.

Property titles and easement data has been obtained from LINZ for the proposed route.

7 Route Design

7.1 Waipu Town to Nova Scotia Drive Bridge

From Waipu town, the preferred trail alignment utilises the existing shared path link through to Halifax Drive. Continuing along Halifax Drive and through the existing accessway to the Waihoihoi River esplanade reserve, joining onto the Waipu River esplanade reserve. The route follows the reserve around to the existing Nova Scotia Drive pedestrian connection, entering onto Nova Scotia Drive just south of the Waipu River Bridge. A culvert crossing is required to allow cyclists to traverse the existing table drain onto Nova Scotia Drive.

The route continues northwards on Nova Scotia Drive and crosses the Waipu River using the existing road bridge. Due to the narrow bridge and lack of available shoulder space for cyclists, electronic warning signs are proposed for motorists due to the lack of shoulder space available. The installation of electronic warning devices is considered a short term mitigation option, with the long term solution being the construction of a dedicated pedestrian and cyclist bridge once funding can be obtained. This design aspect is addressed specifically in 'Section 10.2' of this report.

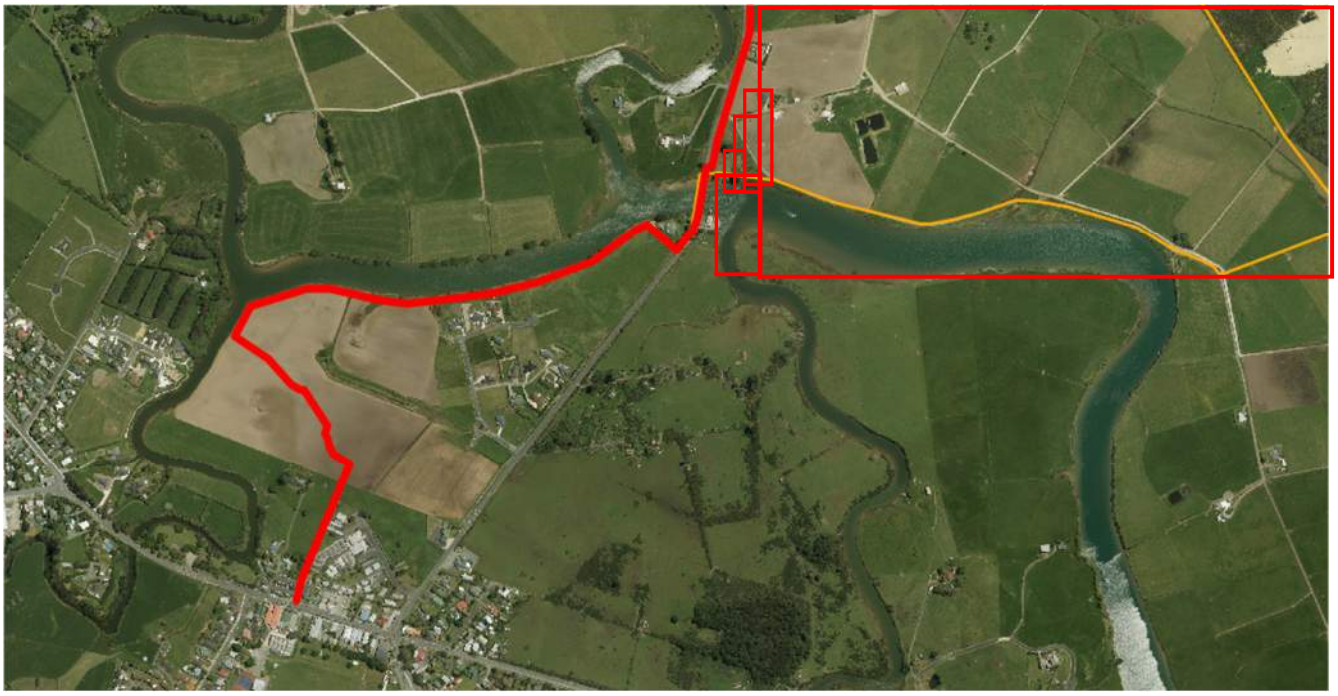


Figure 4: Trail alignment Waipu Town to Nova Scotia Drive Bridge

7.2 Nova Scotia Drive Bridge to Uretiti Beach

After crossing the Waipu River Bridge, the trail alignment follows the road reserve along the eastern side of Nova Scotia Drive, Uretiti Road and onto Tip Road to link into the existing refinery 'pipeline' track through crown owned land (refer Figure 5). For this section, a new dedicated cycle track will be constructed on the berm, next to the road. This will be an unsealed two-way trail, similar to the existing cycleway alongside Cove Road in Waipu. Further details

Figure 5: Trail alignment Nova Scotia Drive Bridge to Uretiti Beach

A secondary option for future development of an 'off-road" route, crosses the road and continues along the Waipu River esplanade reserve, following an existing access road to the McAulay property and Waipu Waste Water Treatment Plant. The route then continues onto a farm raceway, used to access the Waipu Wastewater Treatment plant, there is an easement in place with the agreement for use by WDC for the purpose of accessing the treatment plant. Further investigation into this option and consultation with the landowner has highlighted some risks, with further recommendations for future development of this alignment, outlined in 'Section 8'

7.3 Uretiti Beach to Ruakākā Beach

The proposed trail continues northwards on the pipeline track through to the Waipu Golf Club. The preferred alignment is to cross through the golf club property, adjacent to the western boundary and then link onto the golf club access road to connect back onto the pipeline track at the northern boundary. This alignment requires agreement from the Waipu Golf Club, see 'section 9.10' for further details and risks to be considered.

The alternative route around the golf club has environmental considerations for construction of a trail across the dunes with unstable sand and will require specific design such as a boardwalk. This route option has not been fully investigated and will require consultation with DOC if design it is to be pursued further.

Continuing north on the pipeline track, there is a road crossing at the access road into the Uretiti DOC campground. Along this section, there are a number of opportunities for rest stops and connections onto the beach. Towards Ruakaka Beach there is vegetation clearance required to form the trail through WDC managed public reserve onto Bream Bay Drive. There is currently an informal public walking track in this location.

Figure 6: Trail alignment Uretiti Beach to Ruakaka Beach

7.4 Ruakākā Beach to Ruakākā Town Centre

The Ruakaka Beach area will provide services to trail users including accommodation, general store, public toilet facilities, camp ground and the the Ruakaka Surf Club. From Ruakākā Beach, the short-term option for the route is to utilise the road network from Bream Bay Drive, through Ruakākā Beach Road, Camellia Avenue, then to Marsden Point Road. The route will continue along Marsden Point Road to the north and then onto Peter Snell Drive with connection to Bream Bay College and Ruakākā Shopping Centre with essential services such as supermarket, pharmacy various food options and public toilet facilities. To enable this route, improvements to the existing road marking is required, reducing lane widths to provide a dedicated cycle lane on the sealed shoulder. With the recent reduction in speed limit on Marsden Point Road from 70kph to 50kph, these safety improvements have the additional benefit of providing traffic calming measures for the new urban speed limit. Refer to 'Section 12.2' for further details on the proposed design.

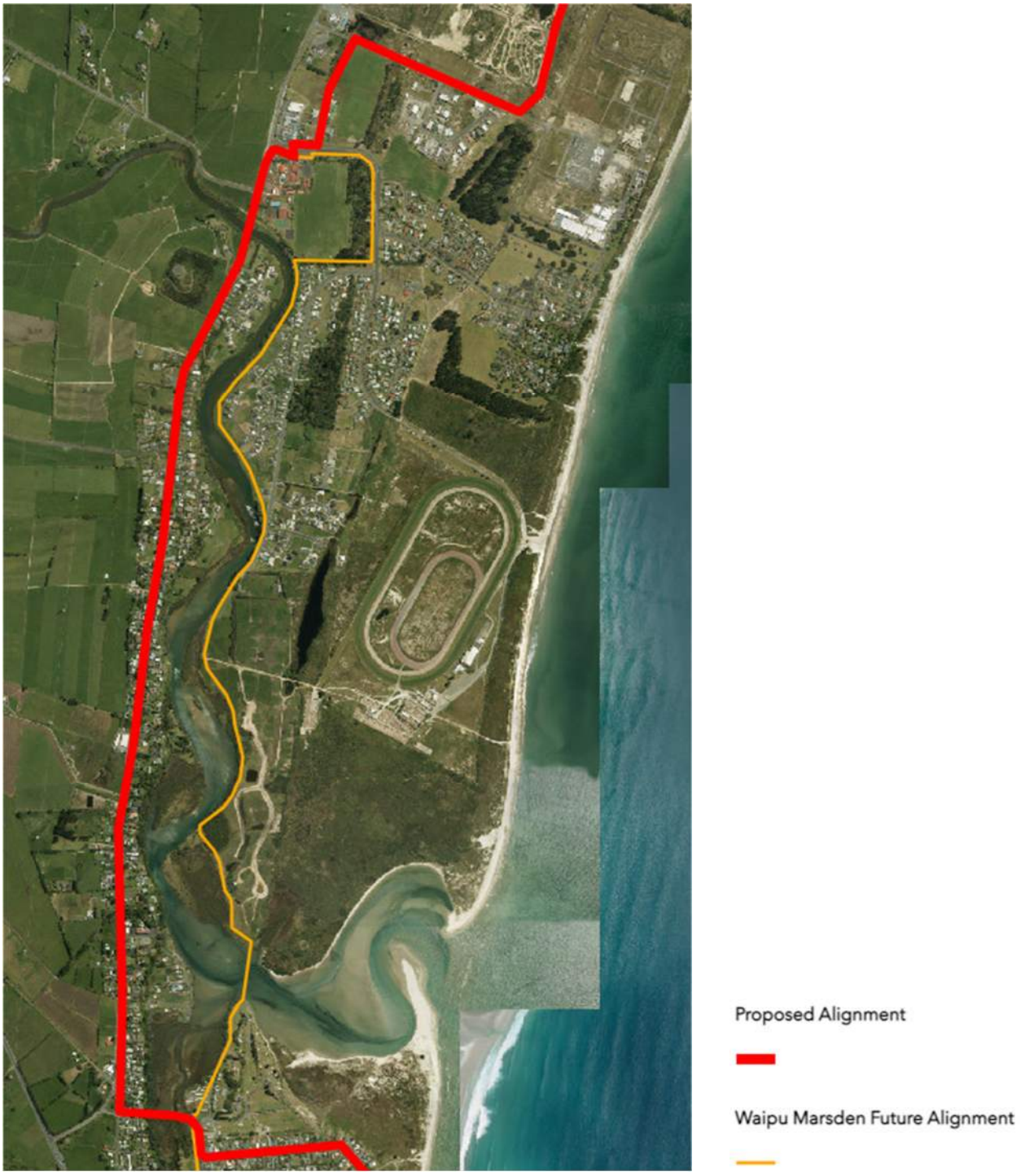


Figure 7 : Trail alignment Ruakaka Beach to Ruakaka Town Centre

7.5 Ruakākā Town Centre to Marsden Point

The proposed route continues through Ruakaka Recreation Centre and car park onto Sime Road, where the trail will be constructed along the berm and connect back onto the pipeline track. The pipline track follows on the alignment of the underground fuel pipes through this area and special precautions will need to be taken for trail construction. First Gas manage the pipeline on behalf of RNZ, further detail can be found in 'Section 9.2'. Designs for the proposed road crossings can be found in section 12. At the northern end on the pipeline track, the trail will continue onto Mair Road, with the Mair Road beach and car park providing a rest stop opportunity.

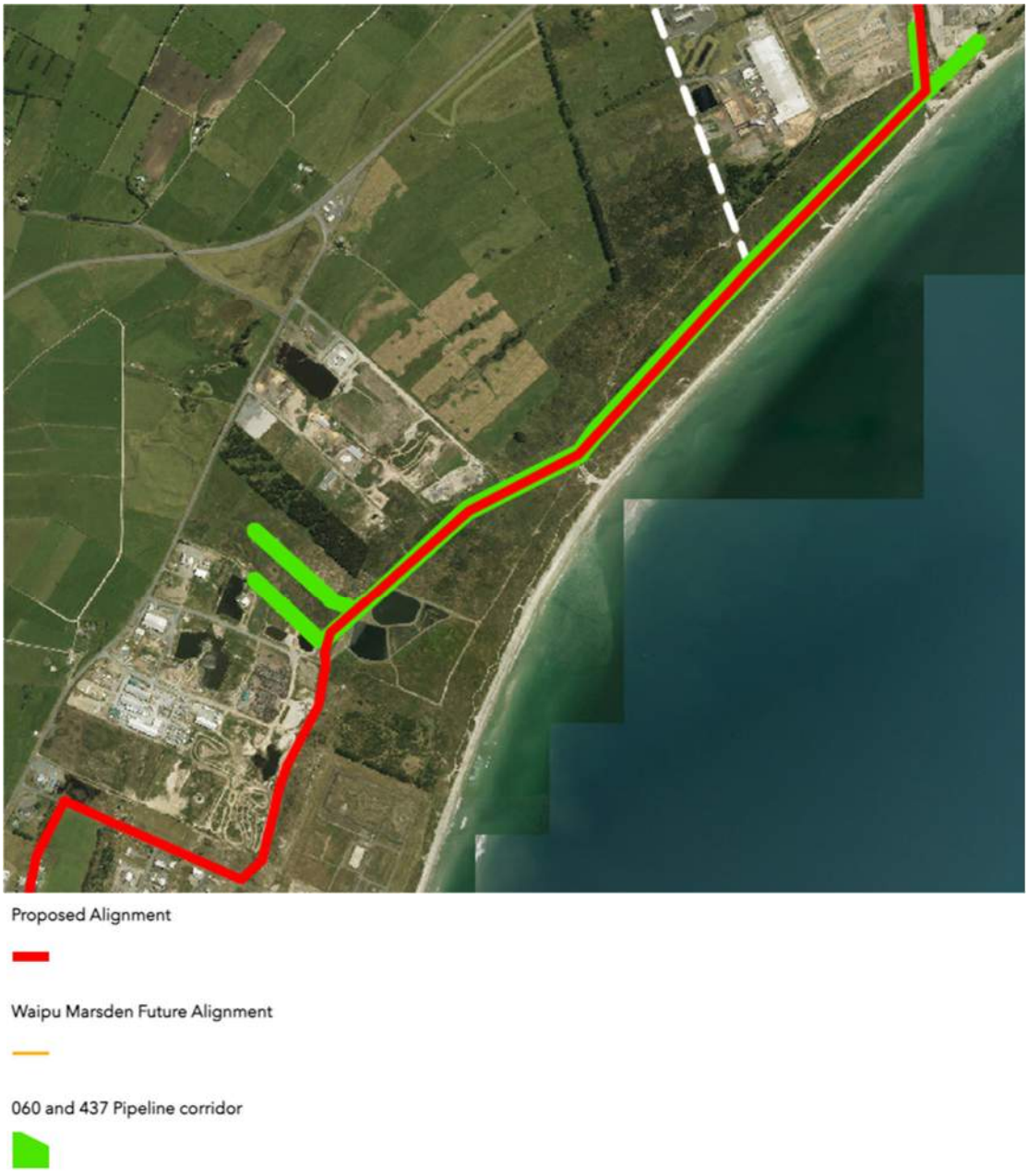


Figure 8: Trail alignment Ruakaka Town Centre to Marsden Point

7.6 Marsden Point to Marsden Cove Marina

The trail follows Mair Road beside the Marsden Oil Refinery to join State Highway 15 (Port Marsden Highway). Along SH15, a dedicated unsealed cycle track is proposed to be constructed along the existing wide berm. Consultation with Waka Kotahi highlighted the need for a dedicated crossing point to allow cyclists to safely cross SH15. This is considered as high priority during the phasing of construction works. The cycle trail will continue along the berm onto Marsden Bay Drive, with a road crossing to enter onto WDC owned land and continuing through to the Marsden Cove Marina.

During consultation with the Bream Bay Shared path Path community group, there was an additional route that was proposed as a shortcut for commuter cyclists to continue through Rama Road. The route is shown in 'Figure 9' below. There is a risk that cyclists on this route may not use the crossing point on SH15 and cut straight across the SH15 intersection with Marsden Bay Drive. In the short term, it is recommended that this is left as an 'informal' route, encouraging cyclists to use the formed trail and dedicated highway crossing. The proposed location of the SH15 crossing provides adequate sight distance and setback from the intersection to avoid conflict with turning vehicles.

Figure 9: Trail alignment Marsden Point to Marsden Cove Marina

8 Land and Property

The following landowners have been identified as having 'significant interest' or are directly affected by the proposed route, with further discussion around their risks in 'Section 9' of this report and Appendix E.

- Waipu Golf Course
- McAuley Property (private), Waipu
- Refinery NZ Pipeline Easement
- Crown-owned land, managed by Department of Conservation
- Public Reserves, managed by Whangarei District Council
- Road reserve, managed by Northland Transportation Alliance
- Road reserve (State Highway), managed by Waka Kotahi NZ Transport Agency

9 Stakeholders

9.1 Department of Conservation

Crown owned land along the beachfront between Waipu and Ruakākā is controlled and managed through the Department of Conservation. To implement the cycleway alignment, consent is required from the Department of Conservation.

Prior to moving forward with construction, a pre-application meeting is to be organised to understand any requirements from DOC. Our liaison with the local Northland DOC office has highlighted the following considerations as part of the cycle trail design.

- Ensuring operators who utilise the pipeline are agreeable to the proposal and do not see it impacting their operations (oil, gas, telecommunications)
- Ensuring iwi have been consulted (Patuharakeke, Te Uri O Hau, Ngatiwai, Te Parawhau)
- Consideration of what would happen to the assets, should the concession be surrendered one day (responsibility for returning land to previous state).
- Fencing of track (Bream Bay dunes are vulnerable to destruction if driven on/walked on etc, so access is limited as much as possible. It's a challenge to keep motorbikes and vehicles out of them already, so putting a track along the back of the dunes would potentially increase this offending).
- Climate change adaptation – coastal erosion and sea-level rise mitigation needs to be considered – is this track going to be fit for purpose in 20+ years

In addition to this, we are proposing that the trail will cross the DOC access road to the Uretiti Campground. This will be raised during the pre-application meeting.

Consultation to date has been directed through Georgie Opie, Community Ranger in the Whangārei Area.

Georgie Opie
Community Ranger | *Kaitiaki hapori whānui*

Whangārei Office
Phone: +64 27 269 5066
gopie@doc.govt.nz

9.2 First Gas and Refinery NZ (RNZ)

First Gas manage the refinery pipeline and access permits on behalf of RNZ. On review of the proposed alignment of the trail, First Gas considered that any major earthworks will pose a risk to damage of the pipeline, and as such, the trail should be designed to limit excavation and in general prefer that formation is restricted to being above the existing ground level. Access to the pipeline for maintenance will mean that the trail construction method should allow accessibility of the pipeline for service vehicles, there is a requirement that vehicle access shall be maintained. The overlap section of First Gas pipeline and the proposed cycle trail is shown in Figure 8.

WSP undertook consultation with First Gas with advice from their Land and Planning Advisor, to ensure that the proposed cycle trail construction method will have minimal effect on the existing pipeline network and its asset maintenance procedure. First Gas will require the construction works to be managed as a part of the Pipeline Corridor Permit process. Additionally, RNZ and First Gas will require details as to how the trail will ensure restricted access to the path, allowing only for bicycles/pedestrians to limit any damage to the dunes and the RoW path. They are concerned about the technicians' access point if the council decides to put barriers around to restrict the site.

In terms of the maintenance procedure, First Gas noted that if RNZ and/or First Gas are required to access the pipeline for maintenance, the trail may be impacted and restrict public access during these works if the trail if excavation around the pipeline is required.

Concurrently, WSP is liaising with the Department of Conservation (DOC) and First Gas regarding the relationship between any other underground utilities and the proposed cycle trail.

Nicola Hine
Land & Planning Advisor
Firstgas
42 Connett Road, New Plymouth, Taranaki, 4312
Phone: +64 27 647 1531
nicola.hine@firstgas.co.nz

9.3 Waka Kotahi NZ Transport Agency

The cycle trail requires a dedicated crossing point on SH15 to allow access to Marsden Drive. Design approval from Waka Kotahi will be required to enable this. Liaison with the Waka Kotahi Northland Senior Safety Engineer has provided Waka Kotahi support on the proposal on the basis that the crossing design meets the required safety standards and is fully constructed from the outset. For this reason, the crossing point will need to be one of the first components to be designed and constructed to allow safe usage of any future trail development. The trail is proposed to run parallel to SH15 between the new crossing and Mair Road. There is sufficient State Highway land available to allow the trail to be constructed offset from the road allowing a dedicated cycle trail to operate with separation of the State Highway.

9.4 Northland Transportation Alliance

The Northland Transportation Alliance (NTA) supports the cycleway project and is the Road Controlling Authority for the roads proposed for the shared space cycle lanes. The design for the cycleway will require changes to roading markings and signs as part of the implementation.

9.5 Bream Bay Shared Path Group

The Bream Bay Shared Path Group is a local group of Bream Bay residents passionate about creating a shared path between One Tree Point and Ruakākā. WSP met with the group to discuss

our proposed alignment for the cycleway. The objectives for the cycleway are aligned between both parties, although the focus of the group is to provide a shared path connection for commuters. For this reason, the group is keen to provide a direct link between the coastal trail and Marsden Bay Drive, proposing a connection through Sime Road. The route options include this connection as well as the original design route that connects to the Refinery and then down to the SH15 crossing point, across to Marsden Bay Drive.

The group wants to implement the cycleway section from Marsden Cove to Ruakākā and are looking to obtain funding for construction with the support of Bike Northland. In order to implement this section, additional support will be required from WDC and Waka Kotahi to construct the dedicated crossing on SH15.

Contacts for the Bream Bay Shared Path Group are Olli Krollmann (olli.krollmann@live.com) and Marilyn Cox (breambaynews@xtra.co.nz).

9.6 Bike Northland

Bike Northland is the regional body for cycling in Northland and is a charitable incorporated society. They have been around since 2007 and are governed by a voluntary board of 5 who are all passionate about cycling in one form or another.

Initial discussions with Bike Northland regarding this project have provided positive feedback on the proposal. Assistance with funding through access to local grants is possible with the Bike Northland guidance. This funding could be obtained for the local groups to implement the first phase of construction, under the 'umbrella' of the Bike Northland charitable status. Local community group members for the One Tree Point Cycleway Group have been in contact with Bike Northland regarding funding opportunities.

Bike Northland Development Officer
Arwen Page arwen@bikenorthland.co.nz

9.7 Marsden Maritime Holdings

Agreement with Marsden Maritime Holdings will be sought for shared use of the boat storage yard access road entranceway to enable connection of the trail, over the water way, into to Marsden Cove Marina for the preferred trail alignment, avoiding the need to use the road intersection with Rauiri Drive.

9.8 Iwi

Consultation with iwi should be undertaken prior to implementing of the route design for construction. The following iwi groups have been identified as having potential interest in the project:

Patuharakeke

Takahiwai Marae
229 Takahiwai Rd
Takahiwai
Patuharakeke Te Iwi Trust Board
PO Box 557, Whangārei
admin@patuharakeke.maori.nz
Patuharakeke

Main Office
Te Tai Tokerau Maori Trust Building
3rd Floor 5 hunt Street, Whangārei
PO Box 657, Whangārei

0800 438 894

Ngatiwai

129 Port Road, Whangārei
PO Box 1332
Whangārei 0140
ngatiwai@ngatiwai.iwi.nz
(09) 4300939

9.9 Te Araroa Trust

The tourism generated from this National trail provides benefit to the local economy, with 1200 hikers recorded in the 2018/19 summer season. The Te Araroa Trail runs from Marsden Point down Ruakākā Beach to Waipu River. Despite the commonality of towns these routes go through, the sections where these routes overlap is minimal. Te Araroa route mainly goes through waterside, whereas the proposed Waipu-Marsden Cove Marina route is more inland. Hence, the proposed route may provide a more defined route than Te Araroa Trust, generating a cycle trails that can be well utilised for commuting purposes.

Figure 10 : Marsden Point/Ruakaka section of Te Araroa Trail

Figure 11: Waipu section of Te Araroa Trail

9.10 Waipu Golf Club

There has been initial consultation between WSP and Waipu Golf Club in respect to the option of the cycleway passing though, within the boundaries of the Waipu Golf Club. The golf club commitee have not supported nor objected to the proposal, however, they have raised some concerns, primarily around the safety risks to cyclists and security risks for the club. They have requested that council owns the risks to accept liability of any injuries to the public while travelling on a cycleway within the Golf Course boundaries. WSP recommends that WDC complete a risk assessment of having the alignment alongside the golf course, discussing options with the club for the council to accept and take responsibility for some of the risks. A letter from the club, addressing concerns raised by the Golf Club Committee, is included in Appendix D.

The preferred cycle route travels through the golf club as shown by the red route in Figure 12. An alternative route is shown in case of any disagreement between the council and the club in the future. This route would require a specific design due to the unstable sand dunes along the beach front. Consultation with DOC will be required to ensure a suitable design is agreed to protect sand dunes from erosion.

Figure 12: Trail route options for Waipu Golf Club

9.11 Private Landowners

9.11.1 McAuley Property, Waipu

WSP has undertaken initial consultation with the McAuley Family who are the landowners adjacent to the proposed trail route on Nova Scotia Drive.

Relocation of the boundary fences will be required to enable construction of the shared path on the Nova Scotia Drive berm, as currently, the fencelines do not align with the true road reserve boundaries (refer Figure 13).

Future trail alignment includes an alternative route alongside the Waipu River within the esplanade reserve, which WDC currently uses to access the Waste Water Treatment Plant (WWTP). This is shown in Figure 5. The existing access road through the esplanade includes a section through private property, with an easement agreement in place between WDC and the landowner.

Future changes to this easement to allow cycle access will require co-agreement from the landowner. The landowner discussed an option for subdivision of the the land as a future residential development. In order to create an easement for public use, the council could include conditions within future subdivision consent, for incorporation of an easement for cycle/pedestrian access between the road reserve and crown owned land.

Further investigation into the creation of a cycleway easement, using the alignment of the existing easment in place for WDC access to the WWTP, was undertaken by Graeme Mathias of Thomson Wilson Law. A draft easement document is included in 'Appendix C', which may be used for the purpose of discussions with the landowner.

Figure 13: Road reserve boundaries on Nova Scotia Drive

10 Consenting and Environmental

10.1 Scope of Works

The trail will be located predominately on rural land under crown or local government control and within road reserves, described below:

On Road

- Along the road reserve of Port Marsden Highway (SH15),
- Along the carriageway through Marsden Point Road;
- Along the road reserve of local roads; and

Off Road

- Along gravel / unformed paths on private property (subject to agreement),
- Along local authority and DOC managed reserves / foreshore.

The proposed activities include the construction of a new cycle trail with respect to the zoning requirements. The Trail will be constructed primarily off-road and within the road reserve. The off-road portions of the path will require trail construction where relevant.

The proposed works include:

- New off-road cycle trail construction (unsealed)
- Installation of vehicle access controls
- New road marking and traffic signs
- Localised road shouder widening
- Construction of dedicated road crossings
- Vegetation clearance
- Minor drainage improvements
- Minor associated earthworks

10.2 District Plan (WDC)

10.2.1 Waipu To Ruakākā

Figure 15 and *Table 2* illustrate and summarise the aerial and zoning maps for the section of the Trail between Waipu to Ruakākā.

Figure 14: Aerial Map between Waipu to Ruakākā (red line – proposed alignment)

Figure 15: WDC Zoning Map between Waipu to Ruakākā

Table 2: WDC Zones – The Trail between Waipu to Ruakākā

	Road Reserve	Off-Road
Zoning	- Rural Village Residential - Rural Village Centre - Rural Production - Rural Living - Sport and Active Recreation - Open Space - Living 1 (Ruakākā)/Low Density - Business 3/Light Industrial - Business 2/Local Centre - Business 4/Heavy Industrial	- Open Space - Natural Open Space - Rural Village Residential - Development Area - Rural Production - Coastal Area - Living 1 (Ruakākā)/Low Density - Business 2/Local Centre - Business 4/Heavy Industrial
Designation	- Designation MPOL-1 Minister of Police - Designation MPOL-3 Minister of Police - Designation MEDU-21, Minister of Education	- Designation FGL-1, First Gas Limited - Designation RNZ-1, Refining New Zealand - Designation WDC-15, Whangārei District Council

*Text in "red" indicates proposed plan change zones.

10.2.2 Ruakākā To Marsden Point

Figure 16 and Figure 17 illustrate the aerial and zoning maps for the section of the Trail between Ruakākā to Marsden Point.

Figure 16: Aerial Map between Ruakākā and Marsden Point (red line – proposed alignment)

Figure 17: Zoning Map between Ruakākā and Marsden Point

Table 3: WDC Zones– The Trail between Ruakākā and Marsden Point

	Road Reserve	Off-Road
Zoning	- Business 3/Light Industrial - Business 2/Local Centre - Business 4/Heavy Industrial - Business 4 Marsden Point Port/Heavy Industrial - Marsden Point Port/Port Zone - Open Space/ Natural Open Space - Future Marine Village/ Medium Density Residential	- Business 2/Local Centre - Business 4/Heavy Industrial - Open Space/Natural Open Space
Designation	- Designation NZTA-5, Waka Kotahi	- Designation WDC-3, Whangārei District Council

	- Designation TPR – 3, Transpower New Zealand Ltd. - Designation S13, Marsden Port - Designation KRH-2, Kiwi Rail Holdings Ltd.	- Designation FGL-1, First Gas Limited - Designation RNZ-1, Refining New Zealand

10.3 Regional Plan (NRC)

The following Northland Regional Council Plans will require consideration:

- Regional Policy Statement for Northland (RPS)
- Regional Water and Soil Plan (RWSP)
- Regional Coastal Plan (RCP)
- Proposed Northland Regional Plan (PNRP) May 2021

10.3.1 Waipu To Ruakākā

Table 4: The Trail between Waipu to Ruakākā - NRC Plans

	Road Reserve	Off-Road
Overlays	- Flood Susceptible Area - Land Instability Low Risk - NRC Priority Rivers Flood 10 Year - NRC Priority Rivers Flood 50 Year - NRC Priority Rivers Flood 100 Year - Notable Public Tree 523 - Natural Character Area: High - Medium and High - Acid Sulphate Soil Risk - Lowland Area - Hill Country Area - Marsden Point Airshed	- Flood Susceptible Area - Land Instability Low Risk - NRC Priority Rivers Flood 10 Year - NRC Priority Rivers Flood 50 Year - NRC Priority Rivers Flood 100 Year - Coastal Erosion Hazard Line (Low) - Coastal Erosion Hazard Line (High) - Outstanding Natural Landscape (Bream Bay Ocean Beach) - Natural Character Area: High - Mean High Water Springs - Acid Sulphate Soil Risk - Groundwater Management Units: Marsden to Ruakākā

		- River Water Quantity Management Units: Small River - River Water Quantity Management Units: Coastal River - Coastal Water Quality Management Units: Estuary - Coastal Water Quality Management Units: Open Coast - Lowland Area - Hill Country Area - Marsden Point Airshed - Marine Pathways place limits: Bream Head to Bream Bay - Tsunami Evacuation Zones (Yellow & Orange) - Biodiversity Wetlands
Catchment and Hydrology	Permanent Streams and Creeks, Overland Flow paths, Flood Prone Areas, Floodplains, Indicative Streams	

10.3.2 Ruakākā to Marsden Point

Table 5: The Trail from Ruakākā to Marsden Point - NRC Plans

	Road Reserve	**Off-Road**
Overlays	- Flood Susceptible Area - Medium and High - Acid Sulphate Soil Risk - Lowland Area - Hill Country Area - Marsden Point Airshed	- Lakeside Business Park Plan Change 81 - Oil Refinery Overlay Area - Waiora Northland Priority Catchment: Whangārei - Flood Susceptible Area - Coastal Erosion Hazard Line (Low) - Coastal Erosion Hazard Line (High) - Mean High Water Springs - Acid Sulphate Soil Risk

		- River Water Quantity Management Units: Small River - River Water Quantity Management Units: Coastal River - Coastal Water Quality Management Units: Estuary - Coastal Water Quality Management Units: Open Coast - Lowland Area - Hill Country Area - Marsden Point Airshed - Marine Pathways place limits: Bream Head to Bream Bay - Tsunami Evacuation Zones (Yellow & Orange) - Biodiversity Wetlands
Catchment and Hydrology	Permanent Streams and Creeks, Overland Flow paths, Flood Prone Areas, Floodplains, Indicative Streams	

10.4 Archaeology

ArchSite was used to identify the archaeological sites located between Ruakākā and Marsden Point (*Figure 18*). For clarity, further desktop and site investigation is required to determine the archaeological risk in line with the statutory requirements of the Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA) and the RMA.

A cultural impact assessment is a report documenting Maori Values, interests and associations with an area and the potential impacts of a proposed activity on the area. Although there is no statutory requirement for a cultural impact assessment, the impacts on cultural values and interests can assist both applicants and councils when preparing and processing resource consents.

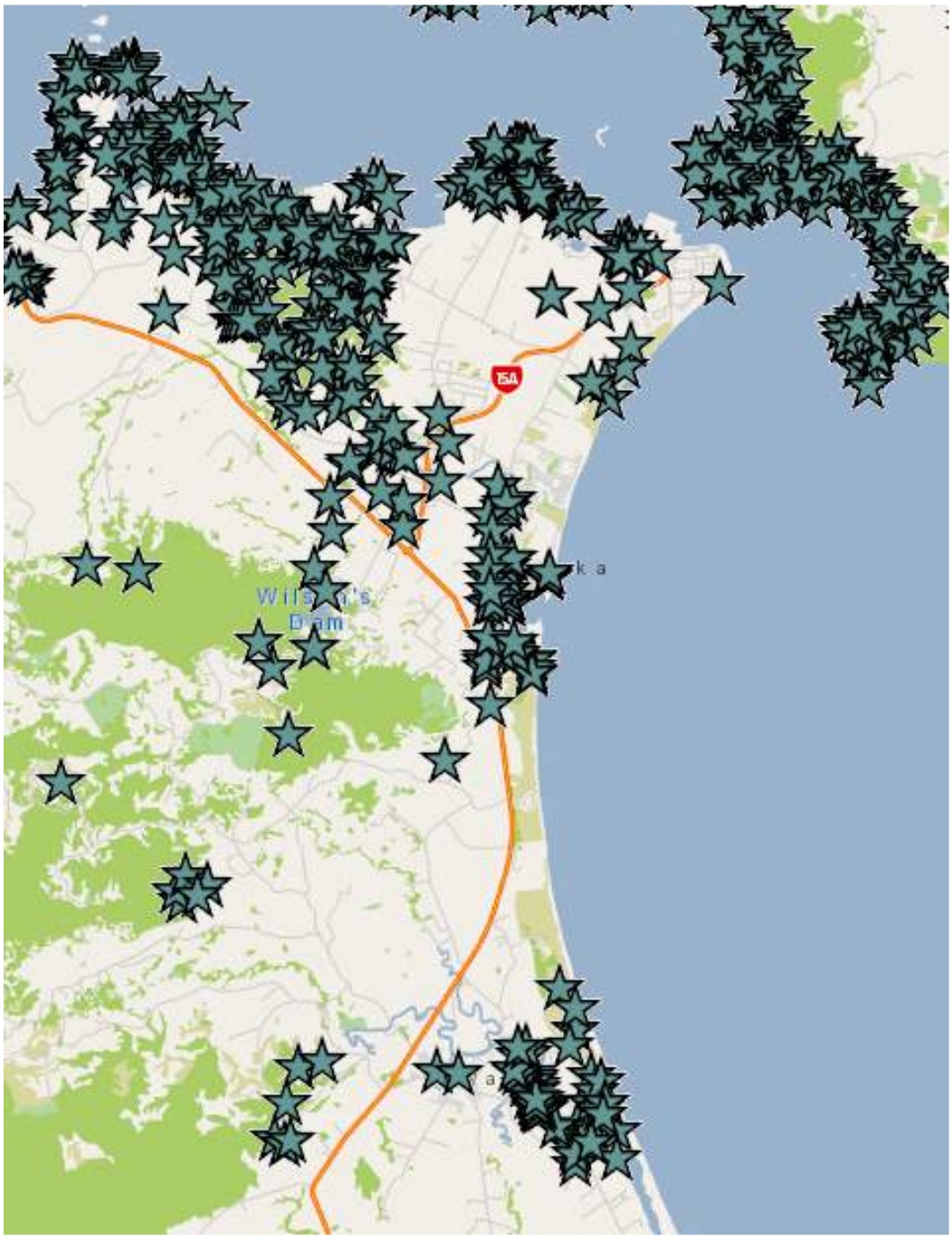


Figure 18: Archaeological sites between Waipu and Marsden Point on ArchSite

10.5 Geology

Assessment of the geology was incorporated into the typical cross section designs, predominantly of the Karioitahi Group consolidated sand dunes. Construction of the unsealed trail will generally follow natural topography, avoiding the need for excavation.

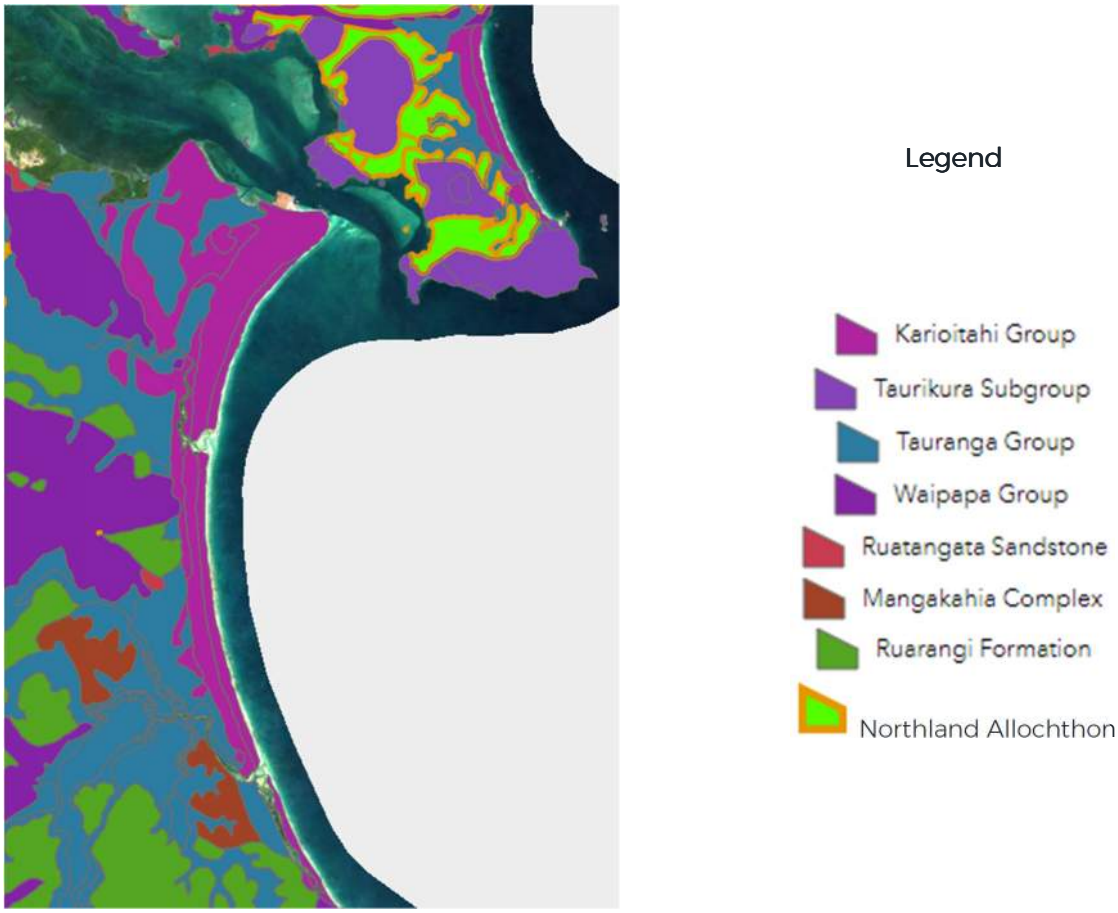


Figure 19: Geology near the proposed cycle trail (GNS Layer)

11 Pavement Construction

11.1 Typical Details

Assessment of the geology has highlighted the need for varying construction methods to develop pavement types, provided as typical cross-sections for construction of the trail according to the ground conditions. The 'off-road' trail subgade types can generally be divided into three broad groups:

1. Unstable sand
2. Consolidated sand and clay
3. Existing unsealed pavement (vehicle access tracks)

The off road sections of the trail have been designed with the intention of a simple construction methodology that requires limited plant and materials. This will enable these sections of the trail to be constructed through community groups where possible. The majority of the pavement types will fall under the following typical details:

'Type R' Pavement Detail: Unstable Sand

Geotextile is proposed to be placed on top of the sand to increase sand stability below the granular layers. A 200mm compacted GAP 65 layer will form the pavement base with a 50mm layer of GAP 20 as the wearing course, providing a smoother riding surface for cycles. H4 treated timber edging and posts may be used to contain the granular material and reduce migration in exposed areas where sand movement is likely to occur.

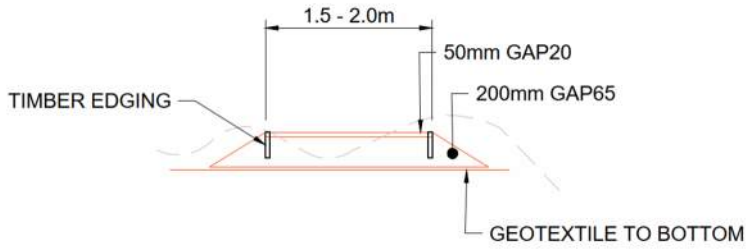


Figure 20: Typical cross-sections for loose sand ('Type R' pavement)

'Type T' Pavement Detail: Consolidated Sand & Clay

Consilidated sand and clay require construction of only the 50mm GAP20 wearing course. Prior to this, the existing ground will be shaped and compacted to achieve a consistent grade. Refer to Figure 21 below. No significant earthworks are proposed, the trail is to generally follow existing topography.

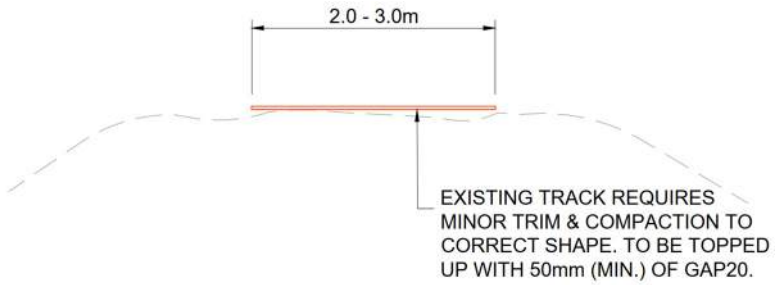
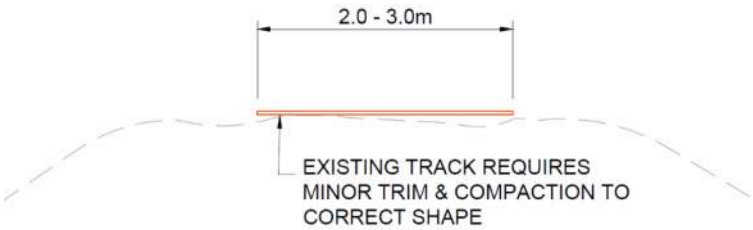


Figure 21: Typical cross-sections for compacted sand or clay ('Type T' pavement)

'Type S' Pavement Detail: Existing Unsealed Pavement

Where the trail follows existing vehicle access tracks, no change to the existing pavement is proposed. On visual assessment of the pavement condition, there were some localised areas of potholing and rutting identified. Surface grading, topping up of the metal using GAP20 and compaction will be required to achieve a suitable surface for riding.



Construction preparation works will require vegetation trimming and clearing across various sections of the trail. The most significant vegetation clearance will required for the section south of Ruakaka Beach from chainage 9.260 to 9.860. Other sections of the trail will require vegetation works to a lesser extent. The vegetation along the trail is considered to be primarily small trees and scrub, predominantly containing pest-plant species. Approval from DOC will be required prior to undertaking this work on crown owned land.

12 Trail Design

12.1 Proposed Route – Short Term (Years 1 to 10)

The cycle trail will start at the existing 'zebra' crossing in the centre of Waipu, identified as chainage (CH 0.000). The trail will terminate at Marsden Cove Marina at CH 25.974.

CH 0.00 to 0.500 is on existing formed concrete path – will require installation of signage for wayfinding and traffic on Halifax Drive.

CH 0.500 to 1.540 runs through a river esplanade and will require construction of new metal track and installation of wayfinding signage.

CH 1.540 TO 1.600 is on an existing concrete footpath – will require wayfinding signage.

CH 1.600 to 1.800 is on Nova Scotia Drive – will require installation of a culvert and crossing over the table drain. Traffic warning signs and a 'cyclist' activated electronic sign for shared use of the existing road bridge.

CH 1.800 to 1.820 is a road crossing – will require construction of a dedicated crossing. Refer to Section 12.2.1 for the proposed design.

CH 1.820 to 2.510 is on the eastern berm of Nova Scotia drive. Relocation of the property boundary fences is required, to enable use of the road reserve land. Vegetation clearance and construction of a metal track. The existing power pole locations may cause some conflict with the alignment of the trail, however, it is envisaged that in the short term, the trail will be formed around the poles in their current positions. Installation of traffic warning signs and a 'cyclist' activated electronic sign for shared use of the existing road bridge near CH 1.820.

CH 2.510 to 3.790 continues along the berm onto Uretiti Road. Relocation of the property boundary fence is required to enable use of the road reserve land for construction of a metal track. The route turns right into Tip Road at the end of CH 3.790.

CH 3.790 to 4.160 runs along the berm of Tip Road, where the road changes to unsealed pavement at CH 3.990. At CH 3.810 to 3.820, there is a crossing point proposed to allow use of the wide road reserve along the northern boundary

CH 4.160 to 5.120 is on the existing pipeline track within Uretiti Scenic Reserve – will require minor shaping for prepararion of existing ground construction of a metal track with wayfinding signage to be installed.

CH 5.120 to 5.500 is within the Waipu Golf Club. Currently in the stage of consultation between the Council and the Golf Club. Refer to Section 9.10 in this report. The proposed alignment runs along the western boundary to the Golf Club access road. Will require constrction of a metal track adjacent to the boundary fenceline.

CH 5.500 to 6.040 shared use of the Golf Club access road, installation of traffic warning signs.

CH 6.040 to 6.260 new section of trail to be constructed, allowing access from the northern boundary of the Golf Club to link back onto the pipeline track.

CH 6.260 to 6.980 on the existing pipeline track within Uretiti Scenic Reserve – will require construction of a metal track with wayfinding signage to be installed.

CH 6.980 to 7.010 road crossing at the Uretiti Beach DOC Camp Site access road.

CH 7.010 to 9.260 on the existing pipelne track through Ruakākā Scenic Reserve - will require construction of a metal track with wayfinding signage to be installed.

CH 9.260 – 10.170 clearing vegetation and construction of a new metal track to link through to the Bream Bay Drive cul-de-sac

CH 10.170 to 11.310 runs along the existing footpath or road on Bream Bay Drive. The route passes through low-volume road intersections, it is recommended to consider upgrades to pavement marking and traffic warning signs for cyclists.

CH 11.310 to 11.690 continues running along the footpath adjacent to Ruakaka Beach Road. The footpath located on the bridge at CH 11.500 is narrow and give-way priority arrows should be implemented for cyclists.

CH 11.690 to 11.840 on Camellia Avenue. Cyclists will be guided along this route to avoid the main intersection when entering Marsden Point Road.

CH 11.840 a road crossing to separate the cyclists by their travel direction. The design for this crossing can be found in Section 12.2.2.

CH 11.840 to 15.110 runs along the existing road shoulder on Marsden Point Road. At CH 14.740, a crossing point guides northbound cyclists to cross the road and to travel over the narrow bridge via the existing footpath located CH 14.800 to 14.840.

CH 15.110 to 15.310 runs along the footpath adjacent to Peter Snell Road until it turns into Takutai Place – footpath width varies from 1.2m to 1.5m, widen to a minimum of 1.8m where possible. Between CH 15.180 – 15.220, it uses the existing crossing facility to cross over Peter Snell Rd – will require signage and markings. WDC considered this crossing point as a part of Raised Priority Pedestrian Crossing. The proposed design can be found in Section 12.2.3 of this report.

CH 15.310 to 15.480 continues along the footpath adjacent to Takutai Place. This then continues to the footpath near Ruakaka Recreational Centre car park entrance. The cyclists should cross the accessway to the car park with care.

CH 15.480 to 15.680 runs through Ruakākā Recreational Centre. This will require a new metal track and signage across the existing grassed area.

CH 15.680 to 15.700 proposed crossing point across Sime Road. The design for this crossing point in outlined in Section 12.2.4.

CH 15.700 to 16.320 runs on the side of Sime Road. A metal track will be constructed along the berm, with ground shaping required to achieve the track formation.

CH 16.320 to 17.130 runs through the conservation area next to Sime Rd – utilie existing vehicle track, installation of wayfinding signage.

CH 17.130 to 19.780 on the existing track through Poupouwhenua Scenic Reserve until turning into Mair Rd at CH 19.840. The existing track will require shaping of the existing ground, with earthworks to be kept to surface only. Will require access permit with DoC and Firstgas, which is didcussed in Sections 9.1 and 9.2 in this report.

CH 19.780 to 20.700 will run along Mair Rd (low volume) until turning into Marsden Point Highway at CH 20.700.

CH 20.700 – 21.580 runs on the berm adjacent to Marsden Point Highway on a new 2.2m wide metal track. A crossing has been proposed at CH 21.180 – 21.200, which can be found in Section 12.2.5 of this report.

CH 21.580 – 22.620 will run adjacent to Marsden Bay Drive on a new metal track. The trail will be required to cross over the entranceway to the Northport access road.

CH 22.620 – 22.630 new road crossing and culvert to allow access onto WDC reserve (to be designed).

CH 22.630 – 22.940 – new trail constructed across WDC reserve. Access onto Rauiri Drive via existing bridge constructed for access into the boat storage yard (will require agreement from Marsden Maritime Holdings).

22.940 – 22.974 new road crossing to allow connection to Marsden Cove Marina.

12.2 On-Road Safety Improvements

There are five proposed crossing locations, these have been designed on Nova Scotia Drive, Marsden Point Road, Peter Snell Drive, Sime Road and State Highway 15 near Marsden Bay Drive. Crossing locations have also been identified for Breton Drive, Tip Road, Marsden Bay Drive and Rauiri Drive. These are not yet designed, however, will be of a similar layout to the other crossings points. The crossings aim to provide a safe place for cyclists to cross the road, whilst providing advance warning for motorists. The specifications for designs were based on the following New Zealand Standards:

- NZTA Pedestrian Planning and Design Guide
- New Zealand Cycle Trail (NZCT) Design Guide 5th Edition
- Manual of Traffic Signs and Markings (MOTSAM) Part 1 and Part 2
- AUSTROAD Guide to Road Design Part 6A – Paths for Walking and Cycling
- Waka Kotahi NZTA Traffic Control Devices Manual Part 5, Traffic Control Devices for General Use – Between Intersections
- NZTA Cycling Network Guidance 2019.

12.2.1 Nova Scotia Drive

Road	Nova Scotia Drive
RAMM Displacement	1.71 – 1.91
Speed Environment (km/h)	100
ADT (vpd)	2851
Site Constraints	Table drain crossing, narrow unsealed shoulder. Narrow 2-lane bridge with no shoulder space.
Design Scope	New culvert for crossing over table drain. Widening of shoulder, installation of warning signs. Pedestrian/cyclist push button activated warning signs for bridge crossing. Road crossing to be constructed north of the bridge, traffic warning signs needed. To be replaced in the future with new pedestrian bridge and underpass crossing.

In the short term, the project plans to utilise the current bridge at Nova Scotia Drive as a 'shared space' for both traffic and cyclists. In order to maintain safety while cyclists are on the road, a series of safety measures are going to be employed to temporarily decrease speeds in the area. Some of these measures include:

12.2.1.1 Signage

Slow traffic while cyclists present: This sign is found in the TCD manual (W16-10) and is often used around the country to slow traffic while cyclists are crossing a narrow bridge. By using this sign in combination with an active PW-35 'cyclists present' sign that can be manually

activated, the speed environment will potentially be halved from 80kph to 40kph, greatly increasing safety.

Signs will also need to be installed at crossing points to promote safety – such as the 'cyclists give way to traffic' from the TCD manual.

12.2.1.2 Kerb build out

The use of a kerb build out in combination with safe hit posts will allow cyclists to enter the roadway with increased safety as they approach the bridge.

12.2.1.3 Crossing points

One of the challenges faced when crossing a narrow bridge is that the cyclists are required to travel in the same direction as the traffic, as there is insufficient shoulder space for a two-way cycle lane. This means that cycle lanes will need to operate on both sides of the road and have crossings at either end where the sight distance permits. To ensure a safe crossing location, a shoulder build out is proposed, allowing cyclists to wait until a safe opportunity to cross the road at 90 degrees with good visibility of traffic in either direction.

Offset crossing points: The crossing point for the cyclists should be offset from the point where cyclists heading in the opposite direction join the road. Using this method removes wayfinding confusion and reduces the conflict of cyclists heading in opposite directions.

12.2.1.4 Delineation

Coloured surfacing and should be installed on the road shoulder where there is a designated cycleway lane, along with white painted symbology to delinate the cycleway shared zone and direction of travel. This helps reduce confusion and raises awareness of cyclists for motorists.

The long-term plan is construct a dedicated pedestrian and cycle bridge parallel to the current bridge. The future trail alignment may be constructed to cross Nova Scota Drive as an underpass, below the existing road bridge, continuing along the Waipu River esplanade reserve.

The following images show the cycleway that was constructed on Broadlands Drive, Omaha. The proposed delineation for Marsden Point Road will be similar to this. The existing parking along the Marsden Point Road shoulder will be removed to allow for this.

Figure 22: Pavement markings and coloured surfacing delineate the cycleway, Broadlands Dr, Omaha

Figure 23: Safe hit posts separate the cycleway from traffic lanes, Broadlands Dr, Omaha

12.2.2 Marsden Point Road

Road	Marsden Point Road
RAMM Displacement	0.28 – 3.61
Speed Environment (km/h)	50
AADT	2234
Site Constraints	Existing footpath width, private accessways, side road crossings, shared use of existing laneways for property access. Long term route, this section will be bypassed.
Design Scope	Design to include traffic signs required for both warning and to delineate the trail. A detailed review of path alignment to ensure transitions between footpath/laneways are safe and suitable for use. The design is required for side road crossing locations, signs and markings. Consider if footpath widening is needed and/or a realistic option.

The crossing point aims to divide the direction of travel on Marsden Point Road and encourage the cyclists travelling to Ruakaka Beach Road to continue along Camellia Avenue. Utilising the Camellia Avenue to connect with Ruakaka Beach Road reduces travel distances and removes the need to extend the shoulder width on Marsden Point Road beyond the crossing point and through the Ruakaka beach intersection. However, if the cyclists desire to

continue travelling towards SH1 along Marsden Point Road, they can bypass the kerb structure and the existing fence line.

12.2.2.1 Kerb build-out

Following the proposed short-term cycle trail alignment, a kerb build-out crossing facility has been proposed to address both cyclists and pedestrians to cross safely. The kerb build-outs are located on both sides of the road to shorten the crossing distance and act as a traffic calming device to alert drivers of the upcoming hazard.

12.2.2.2 Cycle trail sepeartion by direction

As shown in Figure 24 below, the cycle trail is separated from the footpath, and it is also segregated by its travel direction to the North of the crossing point. This will reduce the conflicts between different modes and avoid collision between the road users. The cycle lane width and the footpath have been designed according to AUSTROADs and NZTA Pedestrian Planning and Design Guide.

12.2.2.3 Signage and Pavement Marking

In order to guide the cyclists along the cycle way, signs and markings such as RG-26, RG-26B are proposed. To comply with the New Zealand Cycle Trail Design Guide Figure 59, the Give Way sign is placed in the crossing point with green pavement marking to delineate the cycle lane.

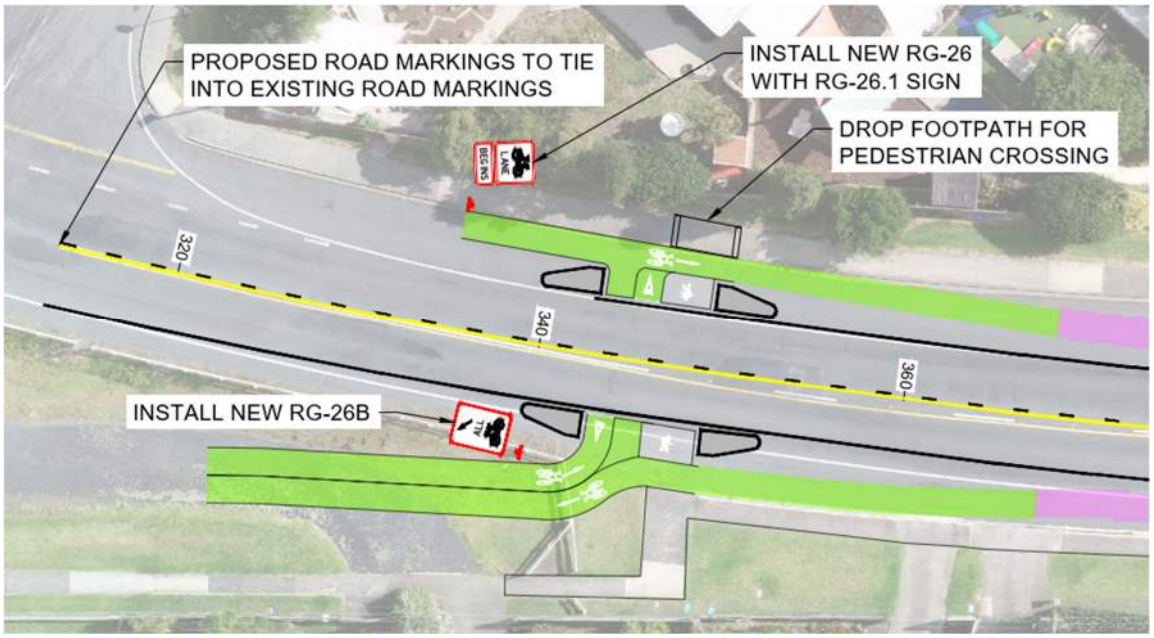


Figure 24: Proposed plan of the crossing point on Marsden Point Road (RP 345m)

A second crossing point on Marsden Point Road is proposed to guide cyclists travelling north to cross the road to travel on the bridge shown in Figure 26. The bridge is too narrow to cope with separated cycle trails on both sides. Therefore, the cyclists and pedestrians will share the existing footpath along the bridge.

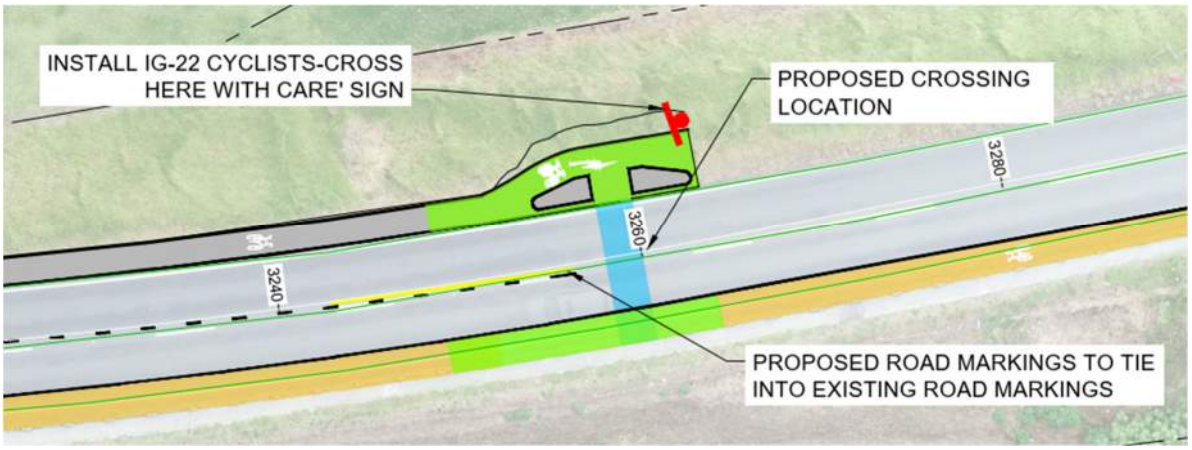


Figure 25: Proposed plan of the crossing point on Marsden Point Road (RP 3260m)

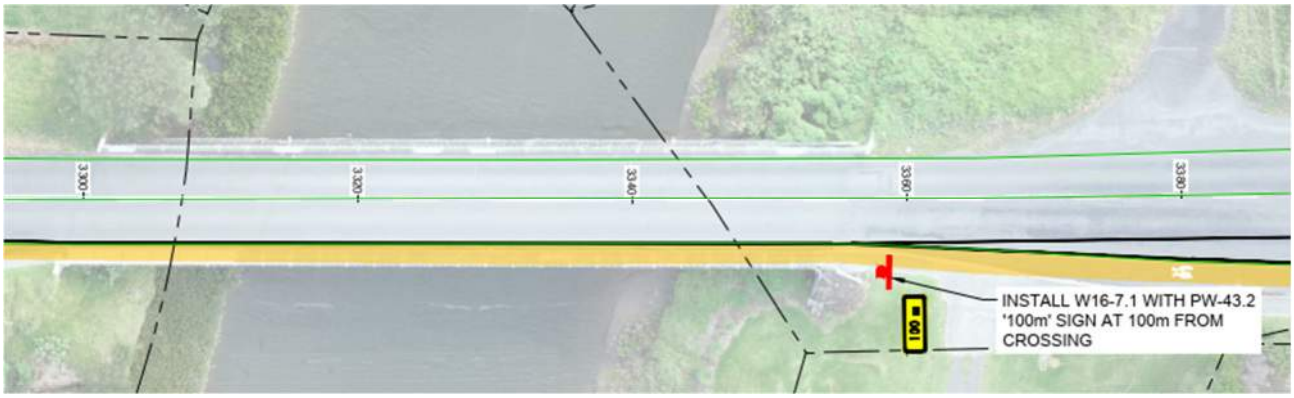


Figure 26: Bridge along Marsden Point Road (RP 3300 – 3340m)

12.2.2.4 Kerb build-out

In order to provide a place for the cyclists to safely find the gap between the traffic and shorten the crossing distance, a kerb build-out has been introduced to one side of the road. The kerb build-out has been installed only on one side as the cyclists travelling towards Waipu can continue cycling in the southbound direction without crossing.

12.2.2.5 Bridge shared zone

On the southern side of the bridge, the cyclway will transition from the roadway onto the existing bridge footpath, a shared zone for both pedestrians and cyclists. The shared zone will be a 'low speed' cycleway and will continue through Ruakaka Town Centre. An example of this transition is shown in Figure 28.

12.2.2.6 Signage and Pavement Marking

Appropriate road signage and pavement marking are to be put in place. This includes AU2R (IG-22) and green pavement marking with cycle lane symbology. Additionally, WU61 with WG3 "100m" (W16-7.1 with PW-43.2) should be placed 100m prior to the crossing point to alert the motorists of the upcoming hazards.

Figure 27: Road signage WU61 (W16-7.1)

Figure 28: Cycleway transition onto bridge footpath, Broadlands Dr, Omaha

12.2.3 Peter Snell Drive

Road	Peter Snell Drive
RAMM Displacement	0.85
Speed Environment (km/h)	50
ADT	2517
Site Constraints	Existing road crossing with pram ramps. Busy intersection with Bream Bay College access, shops and library. Long term, this crossing will be bypassed.
Design Scope	Review adequacy of current crossing facilities and assess if any upgrades are required to traffic signs. Consider safety for crossing points across the carpark entry and accessway to the library/sports complex.

Beyond the bridge on Marsden Point Road, the crossing point on Peter Snell Drive is located in between Bream Bay College and Ruakākā shops. This crossing is considered by Whangārei District Council as a part of Raised Priority Pedestrian Crossing. As a part of this project, WSP also proposes a giveway pedestrian and cyclist crossing point across Peter Snell Drive.

Peter Snell Drive has an AADT of 2517 vpd with a newly proposed speed limit of 50kph. According to NZCT Design Guide Figure 59, the crossing on Peter Snell Drive is recommended to implement giveway controls. However, it is currently proposed to utilise the existing median island to offer safer crossing points for road users.

12.2.3.1 Types of Crossings

The design uses existing zebra crossing at the school bus stop area for the pedestrian crossings, and the cycle crossing point is added to the west of the zebra crossing. Due to the extended crossing, this would require the length of the existing bus stop to be reduced (refer to Figure 29).

12.2.3.2 Signage and Pavement Marking

At the median islands, holding rails have been proposed to encourage cyclists to stop without having to dismount and assist them to move off quickly. A43-7 "WATCH FOR TRAFFIC" signs have also been proposed to alert cyclists and pedestrians to give way to traffic. One of the median islands has been tilted towards the approaching vehicles for visibility.

Across the whole crossing, appropriate signs and pavement markings have been used for distinct visualisation of the mode separation and to guide road users. Directional tactile paving and warning tactile paving have been proposed to advise vision-impaired people.

It was noticed that Bream Bay College has a missing PW-32 sign on Peter Snell Drive. It is recommended to install PW-32 with a supplementary "SCHOOL" sign at RAMM Displacement 222. In addition, PW-35 should be installed on both Peter Snell Road and Marsden Point Road as per MOTSAM standards.

12.2.3.3 Lane Width

The shared path width and the lane width within the median island have been designed referring to AUSTROAD and NZTA Pedestrian Planning and Design Guide. For better visibility, removing the vegetation at the median island is recommended.

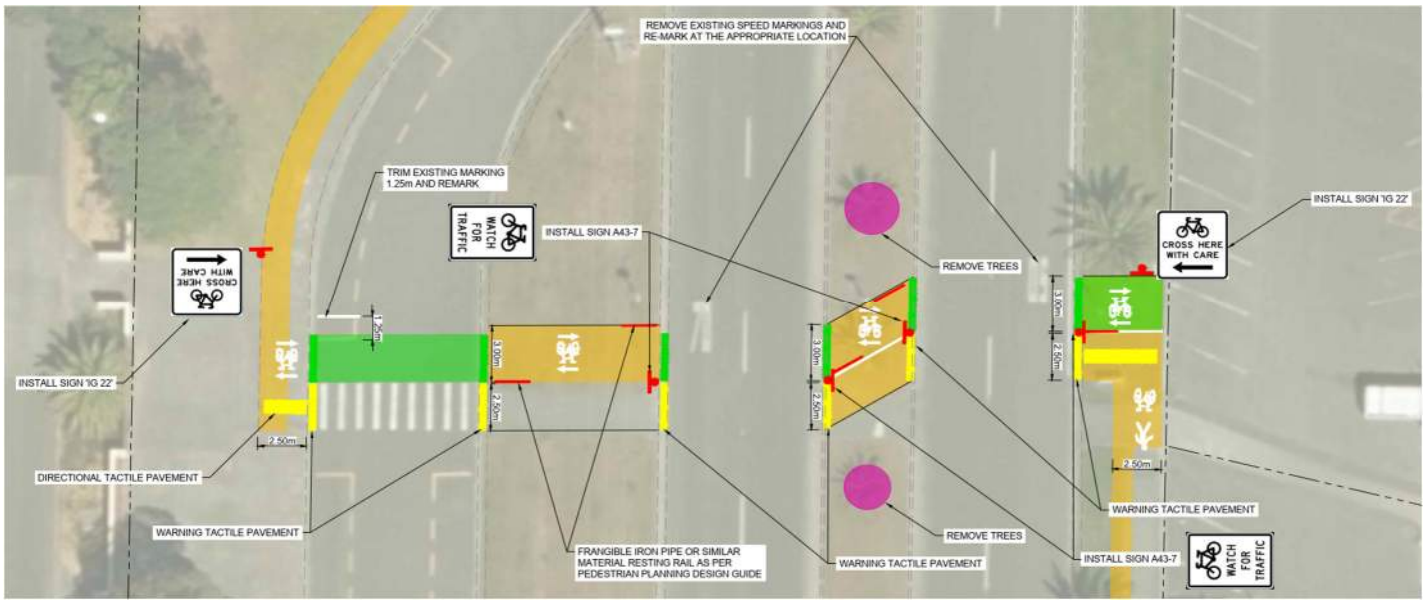


Figure 29: Proposed plan of the crossing point on Peter Snell Drive

The derible minimum width of a cycle lane in a 50kph zone is 1.6m according to NZTA guidelines.

	Cycle lane widths (m)		
Speed Limit (km/hour)	≤50	70	100
Desirable Minimum Width	1.6	1.9	2.5

12.2.4 Sime Road

Road	Sime Road
RAMM Displacement	0.75
Speed Environment (km/h)	50
ADT	281
Site Constraints	Vehicle access gate currently obstructs access to pipeline track (northern side)
Design Scope	Gate to be replaced with steel bollards (or similar), to allow access for pedestrians/cyclists. Install traffic warning signs.

To the North of Peter Snell Road and Ruakākā Recreation Centre, there is a crossing point across Sime Road.

Sime Road is a Secondary Collector with an AADT of 281 vpd. According to NZCT Design Guide Figure 59, crossing Sime Road is recommended to be an Uncontrolled intersection. Therefore, kerb build-outs have been proposed to provide a crossing point for cyclists and pedestrians and act as a traffic calming device.

As shown in Figure 30 below, the area near the islands has been proposed to have a concrete surface. Each lane is designed to be 1.5m wide, which connects with a gravel cycle path. Appropriate road signs and pavement markings such as AU2L and RD6R should be put in place to guide the road users.

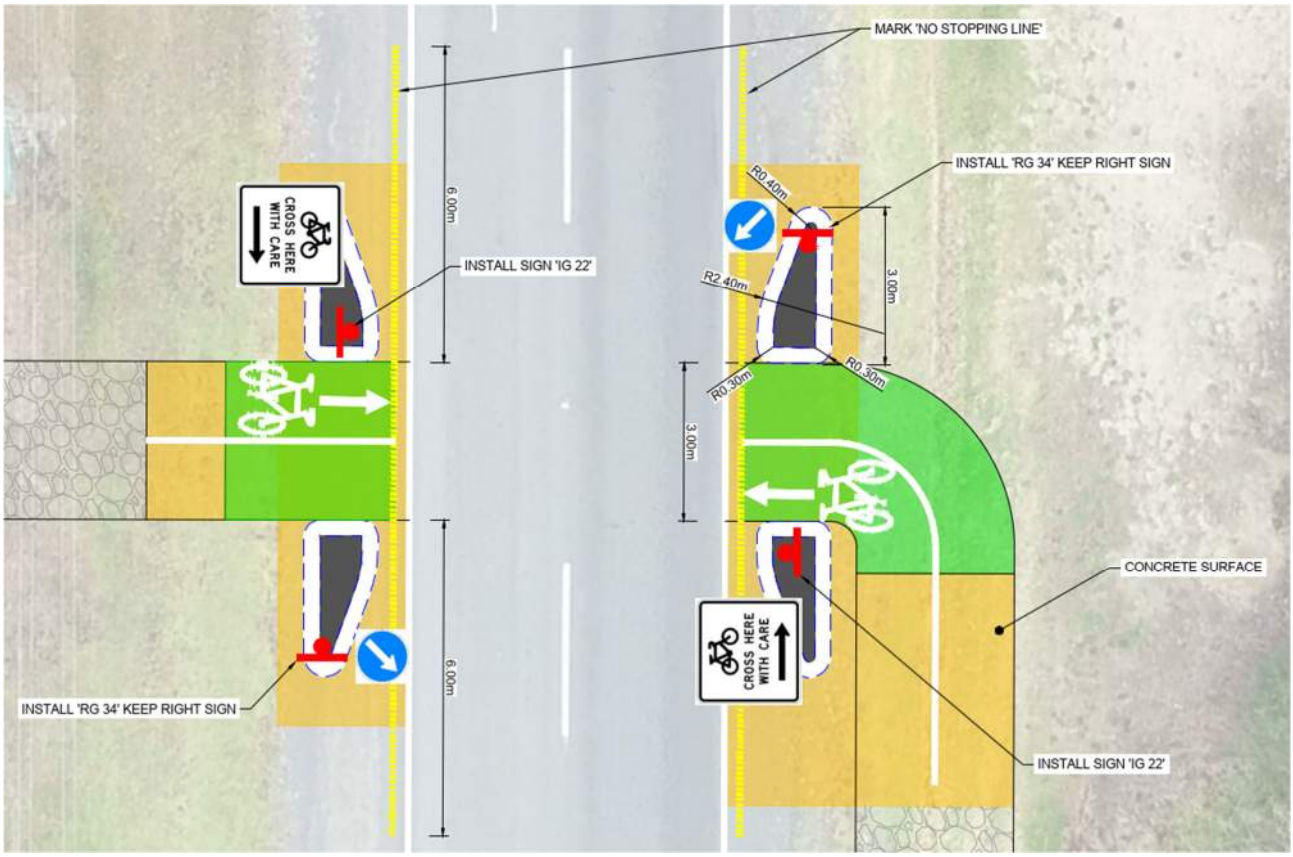


Figure 30: Proposed plan of crossing point on Sime Road

12.2.5 State Highway 15

Road	State Highway 15
RAMM Displacement	7.1 – 7.95
Speed Environment (km/h)	100
ADT	3860
Site Constraints	State highway, rural speed environment, high percentage HCV traffic.
Design Scope	A wide grass berm and construction of trail next to the road are options. Road crossing location and design required. Installation of traffic warning signs. Dedicated crossing point is situated to provide adequate sight distance and avoid conflict with turning vehicles at the Rauiri Drive intersection.

Close to the end of Port Marsden Highway (SH15), WSP has proposed a cycle trail on the road shoulder with a crossing point in the middle of the road section shown above. The section of the road is a high-speed environment (100km/h) with a 19.4% HCV traffic. According to NZCT Design Guide, Figure 59 recommends a median island with give way/stop control to be implemented. However, due to the safety concerns on installing the median island in a high-speed environment, WSP has decided to propose a give way/stop control crossing method.

In order to guide cyclists to cross safely, the following safety measures have been proposed:

12.2.5.1 Kerb build-out

Kerb build-outs have been proposed in combination with a give way control. The traffic islands located close to the road edge line reduces the crossing distance for the cyclist and allow good visibility of traffic in either direction. It ensures visibility of waiting cyclists to approaching vehicles. This will act as a traffic calming device for the motorist, encouraging them to slow down.

12.2.5.2 Advance Warning Signs

In order to alert the approaching motorists of an upcoming hazard, bicycle active warning signs (W19-2.1) have been proposed to be placed approximately 170m prior to the crossing point. This sign will be activated by the cyclist travelling above the induction loop located approximately 70m away from the crossing point, and the triggered active LED signs will stay on for 30 seconds. This will allow the cyclist to travel to the crossing point cross in a safer manner as the motorists will alerted to the presence of cyclists.

Figure 31: W19-2.1 Symbolic Warning – Active LED (Cyclist symbol as in W16-7)

AU2L and AU2R "CROSS HERE WITH CARE" have been proposed to guide the cyclist to an approaching crossing point.

A trial study for electronic cyclist signs was undertaken on SH60 at the Appleby bridge in Nelson. The findings of this study are provided in 'Appendix F'

Figure 32: Appleby bridge biycycle activated sign, Nelson (Source: NZTA)

12.2.5.3 Pavement Marking

Green surfacing should be used at locations where motorists may be unaware of the likely presence of cyclists, or where motorists are likely to cross over the path of cyclists, e.g. intersectrion transitions and across side streets,. White painted arrow should be used to indicate direction of travelto indicate direction. This helps reduce confusion and raises awareness of the presence of cyclists for motorists.

Give way paint markings should also be installed to ensure that the cyclists give way to the motorists, and the motorists have a priority over the crossing movement.

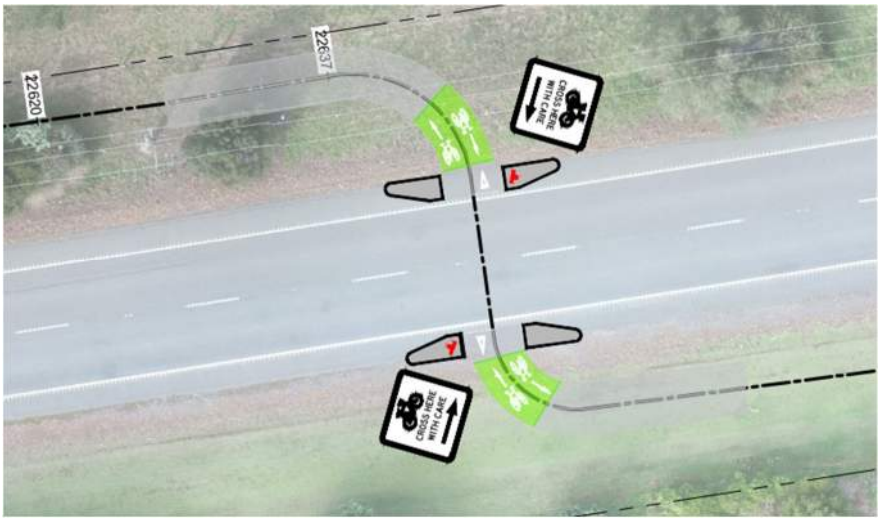


Figure 33: Proposed plan of the crossing point on Port Marsden Highway (SH15)

12.2.6 Other Crossing Locations

The road crossing locations outined below are proposed as a part of the Waipu-Marsden Cove Marina cycle trail although specific designs have not been provided at this stage. The design layouts will be similar to the crossings discussed in the previous section.

12.2.6.1 Tip Road

Road	Tip Road
RAMM Displacement	0.368/0.022
Speed Environment (km/h)	30
ADT (vpd)	267
Site Constraints	Vehicle access gates currently obstruct pedestrian/cyclist access.
Design Scope	Gates to be replaced with steel bollards (or similar), to allow access for pedestrians/cyclists. Traffic warning signs are required.

12.2.6.2 Uretiti Campground Access Road

Road	Uretiti Campground Access Road
RAMM Displacement	N/A
Speed Environment (km/h)	30 (assumed)
ADT	Unknown
Site Constraints	Vehicle access gates currently obstruct pedestrian/cyclist access.
Design Scope	Gates to be replaced with steel bollards (or similar), to allow access for pedestrians/cyclists. Traffic warning signs required.

12.2.6.3 Ruakākā Beach Road

Road	Ruakākā Beach Road
RAMM Displacement	0.28 – 0.45
Speed Environment (km/h)	50
ADT	1721
Site Constraints	One-way bridge and intersection with Bream Bay Drive limit options for crossing locations. Multiple private accessways on eastern side, accessway into campground busy during summer months.
Design Scope	Design for safe crossing location and traffic warning signs required, sight distance needs to be considered. Use of traffic islands should also be considered. Long term, the trail will continue through campground, with a new pedestrian bridge across the river.

12.2.6.4 Mair Road

Road	Mair Road
RAMM Displacement	0 – 1.00
Speed Environment (km/h)	50
ADT	57
Site Constraints	Industrial accessways, shoulder width
Design Scope	Review shoulder width, widening if required. Install traffic warning signs.

12.2.6.5 Marsden Bay Drive

Road	Marsden Bay Drive
RAMM Displacement	0 – 1.12
Speed Environment (km/h)	50/100
ADT	1586
Site Constraints	Rural speed environment, existing culverts with water table, private access roads
Design Scope	Design for cycleway along road berm RHS, need to assess space available, water table along sections and existing culverts that limit widening. Cycleway will cross over private access roads for Northport. Design for road crossing required at Marsden Cove Marina, join into Rauiri Drive footpath. Install traffic warning signs

12.2.6.1 Rauiri Drive

Road	Rauiri Drive
RAMM Displacement	0.350
Speed Environment (km/h)	50
ADT	1071
Site Constraints	Rural speed environment, two way-two lane carriageway with a long median island. A few access points into the gas station and shops.
Design Scope	Design for cycleway along road berm LHS, need to assess space available. Cycleway will cross over a few access points to the shops, car parks and the gas station. Design for road crossing required at Rauiri Drive joining the proposed route coming from Marsden Bay Drive. Install traffic warning signs.

Appendix A
Design Drawings

Appendix B
Engineers Estimate of Proposed Works

	Schedule of Quantities					
	Project:	**Waipu to Marsden Cove Marina Cycle Trail**				
	Prepared:	**Mar-22**				
Item	**Item Description**		**Unit**	**Quantity**	**Rate**	**($) Amount**
	General		**Unit**	**Quantity**	**Rate**	**($) Amount**
1	**PRELIMINARY AND GENERAL**					
1.1	Customer Service		L.S.	1	$ -	$ -
1.2	Establishment		L.S.	1	$ -	$ -
1.3	Quality Management Plan		L.S.	1	$ -	$ -
1.4	Environmental Management Plan		L.S.	1	$ -	$ -
2	**TRAFFIC MANAGEMENT**					
2.1	Preparation of TTM Plan		L.S.	1	$ -	$ -
2.2	Traffic Control and Management of TMP - Working Days		L.S.	1	$ -	$ -
	SUB-TOTAL					**$ 350,000.00**
	Waipu to Tip Road (0.00 to 4155.00)		**Unit**	**Quantity**	**Rate**	**($) Amount**
3	**CONCRETE PATH**					
3.1	Breton Drive to Nova Scotia Drive - widen existing concrete footpath from 1.2m to 2.0m		m2	85	$ 100.00	$ 8,500.00
3.2	Breton Drive to Nova Scotia Drive - construct new concrete footpath 2.0m wide		m2	16	$ 100.00	$ 1,600.00
4	**METAL PATH**					
4.1	Breton Drive to Nova Scotia Drive - allow to install new 2.0m path with timber edging		m2	2080	$ 120.00	$ 249,600.00
4.2	Nova Scotia Drive - allow to install new 2.0m wide path adjacent to road		m2	1382	$ 120.00	$ 165,840.00
4.3	Uretiti Road - allow to install new 2.0m wide path between table drain and boundary		m2	2540	$ 120.00	$ 304,800.00
4.4	Tip Road - allow to install new 2.0m wide path between table drain and boundary		m2	710	$ 120.00	$ 85,200.00
5	**DRAINAGE**					
5.1	New culvert at Stn. 1265		L.S.	1	$ 5,000.00	$ 5,000.00
5.2	New culvert at Stn. 1605		L.S.	1	$ 3,000.00	$ 3,000.00
5.3	Extend existing culvert at Stn. 3158		L.S.	1	$10,000.00	$ 10,000.00
5.4	New culvert at Stn. 3520		L.S.	1	$ 3,000.00	$ 3,000.00
5.5	Extend existing culvert at Stn. 3705		L.S.	1	$10,000.00	$ 10,000.00
5.6	Extend existing culvert at Stn. 3897		L.S.	1	$10,000.00	$ 10,000.00
6	**TRAFFIC SERVICES**					
5.1	Pavement Marking		L.S.	1	$ 5,000.00	$ 5,000.00
5.2	Road Crossing					
5.2.1	Nova Scotia Drive - shoulder widening, concrete islands		L.S.	1	$ 5,000.00	$ 5,000.00
5.2	Traffic Signs					
5.2.1	Supply and Install New IG-22 sign on new post		ea	4	$ 750.00	$ 3,000.00
5.2.2	Supply and Install New W16-7.1 sign on new post		ea	4	$ 750.00	$ 3,000.00
5.2.3	Supply and Install New Supplementary PW43.2 sign on existing post		ea	4	$ 450.00	$ 1,800.00
5.2.4	Supply and Install New Active Warning Signs and Detectors		ea	2	$25,000.00	$ 50,000.00

7	**OTHER**				
7.1	Remove existing vegetation, trim trees, etc.	LS	1	$25,000.00	$ 25,000.00
7.2	Relocate Existing Post and Wire Fence - Nova Scotia Drive, Uretiti Road and Tip Road	m	1530	$ 25.00	$ 38,250.00
7.3	Relocate existing power pole	PS	1	$10,000.00	$ 10,000.00
	SUB-TOTAL				**$ 997,590.00**
	Tip Road to Bream Bay Drive	**Unit**	**Quantity**	**Rate**	**($) Amount**
3	**CONCRETE PATH**				
4	**METAL PATH**				
4.1	Tip Road to Waipu Golf Course - allow for minor trimming and shaping of existing path	m	965	$ 80.00	$ 77,200.00
4.2	Waipu Golf Course - allow for minor trimming and shaping of existing path	m	370	$ 80.00	$ 29,600.00
4.3	Waipu Golf Course - allow to import granular fill, geogrid	m	10	$ 200.00	$ 2,000.00
4.4	Waipu Golf Course - allow to install new 2.0m path with timber edging	m2	310	$ 120.00	$ 37,200.00
4.5	Waipu Golf Course to Uretiti Camp Ground - allow for minor trimming and shaping of existing path	m2	1454	$ 80.00	$ 116,320.00
4.5	Uretiti Camp Ground to Bream Bay Drive - allow for minor trimming and shaping of existing path	m2	6350	$ 80.00	$ 508,000.00
5	**DRAINAGE**				
5.1	New culvert at Stn. 5185	L.S.	1	$ 3,000.00	$ 3,000.00
6	**TRAFFIC SERVICES**				
5.1	Pavement Marking	L.S.	1	$ 2,000.00	$ 2,000.00
5.2	Road Crossings				
5.2.1	Tip Road - no work required	L.S.	1	$ -	$ -
5.3	Traffic Signs				
5.2.1	Supply and Install New W14-4 sign	ea	2	$ 460.00	$ 920.00
5.2.2	Supply and Install New Supplementary W12-3.2 sign	ea	2	$ 460.00	$ 920.00
5.2.3	Supply and Install New W16-2 sign	ea	2	$ 460.00	$ 920.00
5.3	Tactile indicators	L.S.	1	$ 1,500.00	$ 1,500.00
7	**OTHER**				
7.1	Remove existing vegetation, trim trees, etc.	L.S.	1	$20,000.00	$ 20,000.00
7.2	Bollards or similar at Uretiti Camp Ground	L.S.	1	$ 4,000.00	$ 4,000.00
	SUB-TOTAL				**$ 803,580.00**
	Bream Bay Drive to Peter Snell Drive	**Unit**	**Quantity**	**Rate**	**($) Amount**
6	**TRAFFIC SERVICES**				
5.1	Pavement Marking	L.S.	1	$30,000.00	$ 30,000.00
5.2	Road Crossings				
5.2.1	Marsden Point Road (start) - islands, modify fence	L.S.	1	$ 5,000.00	$ 5,000.00
5.2.1	Marsden Point Road (prior to bridge) - pavement widening, islands	L.S.	1	$ 8,000.00	$ 8,000.00
5.3	Traffic Signs				
5.2.1	Supply and Install New RG-26B on new post	ea	1	$ 460.00	$ 460.00

5.2.2	Supply and install New RG-26/RG26.1 on new post	ea	1	$ 750.00	$ 750.00
5.2.3	Supply and Install New IG-22 sign on new post	ea	1	$ 750.00	$ 750.00
5.2.4	Supply and Install New W16-7.1 sign on new post	ea	2	$ 750.00	$ 1,500.00
5.2.5	Supply and Install New Supplementary PW43.2 sign on existing post	ea	2	$ 450.00	$ 900.00
	SUB-TOTAL				**$ 47,360.00**
	Peter Snell Drive to SH15 Port Marsden Highway	**Unit**	**Quantity**	**Rate**	**($) Amount**
3	**CONCRETE PATH**				
4	**METAL PATH**				
4.1	Recreation Ground - allow to install new 2.0m path with timber edging	m2	410	$ 120.00	$ 49,200.00
4.2	Sime Road - allow to install new 2.0m wide path adjacent to road	m2	1230	$ 120.00	$ 147,600.00
4.3	Pipeline Track - allow for minor trimming and shaping of existing path 3.0m wide	m2	2325	$ 80.00	$ 186,000.00
4.4	Pipeline Track - allow for minor trimming and shaping of existing path 2.5m wide	m2	6875	$ 80.00	$ 550,000.00
5	**DRAINAGE**				
6	**TRAFFIC SERVICES**				
5.1	Pavement Marking	L.S.	1	$ 5,000.00	$ 5,000.00
5.2	Road Crossings				
5.2.1	Peter Snell Drive - widen concrete path, tactile paving, resting rails	L.S.	1	$15,000.00	$ 15,000.00
5.2.2	Sime Road - islands	L.S.	1	$ 5,000.00	$ 5,000.00
5.2	Traffic Signs				
5.2.1	Supply and Install New IG-22 sign on new post	ea	2	$ 750.00	$ 1,500.00
5.2.2	Supply and Install New Supplementary W12-3.2 sign	ea	2	$ 460.00	$ 920.00
5.2.3	Supply and Install New W16-2 sign	ea	2	$ 460.00	$ 920.00
5.3	Tactile indicators	L.S.	1	$ 1,500.00	$ 1,500.00
7	**OTHER**				
7.1	Remove existing vegetation, trim trees, etc.	L.S.	1	$20,000.00	$ 30,000.00
7.2	Bollards or similar at 3 existing gates	L.S.	1	$ 6,000.00	$ 6,000.00
	SUB-TOTAL				**$ 998,640.00**
	SH15 Port Marsden Highway to Rauiri Drive	**Unit**	**Quantity**	**Rate**	**($) Amount**
3	**CONCRETE PATH**				
4	**METAL PATH**				
4.1	SH15 Port Marsden Highway - allow to install new 2.0m path adjacent to road	m2	1914	$ 120.00	$ 229,680.00
4.2	Marsden Bay Drive - allow to install new 2.0m path adjacent to road	m2	1956	$ 120.00	$ 234,720.00
4.3	Marsden Bay Drive to Rauiri Drive - allow to install new 2.0m path with timber edging	m2	560	$ 120.00	$ 67,200.00
5	**DRAINAGE**				
5.1	New culvert at Stn. 22630	L.S.	1	$ 5,000.00	$ 5,000.00

6	**TRAFFIC SERVICES**				
5.1	Pavement Marking	L.S.	1	$ 5,000.00	$ 5,000.00
5.2	Road Crossings				
5.2.1	SH15 Port Marsden Highway - islands	L.S.	1	$ 5,000.00	$ 5,000.00
5.2.2	Marsden Bay Drive - no work required	L.S.	1	$ -	$ -
5.2.3	Rauiri Drive - islands, cut through median, resting rails	L.S.	1	$10,000.00	$ 10,000.00
5.3	Traffic Signs				
5.3.1	Supply and Install New IG-22 sign on new post	ea	4	$ 750.00	$ 3,000.00
5.3.2	Supply and Install New Active Warning Signs and Detectors	ea	2	$25,000.00	$ 50,000.00
7	**OTHER**				
7.1	Remove existing vegetation, trim trees, etc.	L.S.	1	$20,000.00	$ 10,000.00
	SUB-TOTAL				**$ 619,600.00**
				TOTAL excl. of GST	**$3,816,770.00**
				Cont	**20%** **$763,354.00**
				GST	**15%** **$687,018.60**
				Total	**$5,267,142.60**

Appendix C
Draft Easement Agreement

Easement instrument to grant easement or *profit à prendre*

(Section 109 Land Transfer Act 2017)

Grantor

DONALD ERNEST McAULAY and GUNSON, McLEAN TRUSTEE SERVICES LIMITED

Grantee

WHANGAREI DISTRICT COUNCIL

Grant of Easement or *Profit à prendre*

The Grantor being the registered owner of the burdened land set out in Schedule A **grants to the Grantee** (and, if so stated, in gross) the easement(s) ~~*or profit(s) à prendre*~~ set out in Schedule A, with the rights and powers or provisions set out in the Annexure Schedule(s)

Schedule A *Continue in additional Annexure Schedule, if required*

Purpose of Easement, or *profit*	Shown (plan reference)	Burdened Land (Record of Title)	Benefited Land (Record of Title) or in gross
Right to Construct, Maintain and Use a Pedestrian Way/Cycle Way	Marked "U" and "V" on DP 504921	Part Allotment 361 Parish of Waipu RT NA24C/1167	In Gross

Easements or *profits à prendre* rights and powers (including terms, covenants and conditions)

Delete phrases in [ ] and insert memorandum number as required; continue in additional Annexure Schedule, if required

Unless otherwise provided below, the rights and powers implied in specified classes of easement are those prescribed by the Land Transfer Regulations 2018 and/or Schedule 5 of the Property Law Act 2007

The implied rights and powers are hereby ~~**[varied] [negatived] [added to]**~~ or ~~**[substituted]**~~ by:

~~[Memorandum number , registered under section 209 of the Land Transfer Act 2017]~~

[the provisions set out in Annexure Schedule B]

Insert instrument type

Easement

1. Definitions

1.1. "Bicycle" and "Cycle" means a vehicle having at least 2 wheels and rotating pedals and is designed to be propelled primarily by the muscular energy of the rider and e-bikes.

1.2. "Burdened Land" means the land contained in Record of Title NA24C/1167.

1.3. "Easement Area" means those parts of the Burdened Land as are shown marked "U" and "V" on DP 504921.

1.4. "Easement for a right to Construct, Maintain and Use a Pedestrian Way/Cycle Way" means an easement granting a right to first construct and thereafter maintain and use a Pedestrian Way/Cycle Way having the rights and powers set out in this instrument.

1.5. "Grantee" means the Whangarei District Council or any successor to or transferee from the Whangarei District Council and includes any of its officers, employees, contractors, or workmen and any other person authorised by it to undertake any Work or exercise any right granted by this Instrument.

1.6. "Pedestrian" means a person on foot and includes a person in or on a contrivance equipped with wheels or revolving runners that is not a vehicle and for the avoidance of doubt includes scooters, motorised scooters and skateboards.

1.7. "Pedestrian Way/Cycle Way" means any pathway formed along the Easement Area over which members of the public may travel as a Pedestrian and by way of Bicycle.

1.8. "Works" means and includes all the activities and undertakings permitted pursuant to this Instrument or authorised by this Instrument or any structure or installation built, constructed, created or installed pursuant to this Instrument or authorised by this Instrument.

2. Interpretation

In this instrument, unless the context indicates otherwise:

2.1. Clauses and Schedules: references to sections, clauses and schedules are references to this instrument's sections, clauses and schedules.

2.2. Defined Expressions: expressions defined in the body of this instrument have the defined meaning in the whole of this instrument.

2.3. Derivations: derivations of defined terms have similar meanings.

2.4. Document: references to a document, deed or agreement include it as amended, novated, replaced or added to.

2.5. Gender: words importing one gender include the other gender.

2.6. Headings: section, clause and other headings are for ease of reference only and will not affect the interpretation or construction of this instrument.

2.7. Including: references to "including" or "includes" or similar words do not imply limitation.

2.8. Joint and Several: all covenants are joint and several.

2.9. Negative Obligations: any obligation not to do anything includes an obligation not to suffer, permit or cause that thing to be done.

2.10. Parties: references to parties are references to parties to this instrument and include their successors, transferees, assigns and representatives.

2.11. Persons: references to persons include references to individuals, companies, corporations, partnerships, firms, joint ventures, associations, trusts, organisations, governmental or other regulatory bodies or authorities or other entities in each case whether or not having separate legal personality.

2.12. Schedules: the schedules to this instrument and the provisions and conditions contained in these schedules have the same effect as if set out in the body of this instrument.

2.13. Singular and Plural: singular includes plural and vice versa.

2.14. Statutes and Regulations: references to any statutory provision includes any statutory provision which amends or replaces it, and any subordinate legislation made under it.

3. Grant of Easement to Construct, Maintain and Use a Pedestrian Way/Cycle Way

3.1. The Grantor grants to the Grantee as an easement in gross for all time from the date of this Instrument the right to construct, maintain and use a Pedestrian Way/Cycle Way with the following rights and powers:

3.1.1. The right to bring onto the Easement Area any scoria, earth, concrete and other materials to create and form a Pedestrian Way/Cycle Way upon the Easement Area;

3.1.2. The right to form a Pedestrian Way/Cycle Way upon the Easement Area together with the right to construct light stands upon which lights and closed circuit television equipment can be installed;

3.1.3. The right to maintain such Pedestrian Way/Cycle Way once formed together with the light stands, lighting and closed circuit television equipment constructed thereon;

3.1.4. The right for members of the public to at all times lawfully use the Pedestrian Way/Cycle Way;

3.1.5. The implied rights and powers of an easement of right of way as set out in the Land Transfer Regulations 2018 shall apply to the extent that such rights and powers are limited to use by Pedestrians and Bicycles.

3.2. Subject to clause 4 and for the avoidance of doubt following the formation of a Pedestrian Way/Cycle Way upon the Easement Area the rights and powers implied by the Fifth Schedule of the Property Law Act 2007 are negated insofar as the use of such Pedestrian Way/Cycle Way is concerned in that such is not a vehicular right of way except for use by bicycles and/or pedestrians.

4. Right of Entry for Construction and Maintenance

4.1. Notwithstanding the terms of this Instrument, the Grantee may, upon giving reasonable written notice to the Grantor, (except in the case of emergency or where the Grantee is entering the Easement Area only where no notice will be required), and for the purposes of performing any function or in the exercise of any rights granted or implied under this Instrument:

4.1.1. Enter upon the Burdened Land by a reasonable route and with all necessary tools, plant, vehicles and equipment; and

4.1.2. Remain on the Burdened Land for such reasonable time or times as shall be necessary to undertake the Works or perform any other activity consequent to the grant herein recorded; and

4.1.3. Leave tools, vehicles, plant and equipment on the Burdened Land for such temporary period as shall be reasonably required.

5. Terms and Conditions

5.1. The Grantee covenants with the Grantor that it will:

5.1.1. at all times use reasonable care and skill when exercising the rights and powers under this instrument;

5.1.2. avoid causing any unnecessary interference with the Grantor's use and enjoyment of the Burdened Land;

5.1.3. give prior notice and consult the Grantor before entering the Burdened Land for execution of any Works under this instrument (except in the case of emergencies or where the Grantee is entering the Easement Area only);

5.1.4. at all times comply with its obligations under health and safety legislation, including (without limitation) the Health and Safety in Employment Act 1992 and the Health and Safety at Work Act 2015;

5.1.5. immediately give notice to the Grantor of:

(a) any damage, accident, incident, or defect relating to or arising out of the Easement Area;

Annexure Schedule

Insert instrument type

Easement

Continue in additional Annexure Schedule, if required

(b) any event required to be notified to the health and safety regulator caused by, arising out of, or otherwise occurring in relation to the easement; and

(c) any circumstances likely to cause any damage, illness, or injury caused by, arising out of, or otherwise occurring in relation to the easement; and

5.1.6. sufficiently compensate and indemnify the Grantor or rectify any damage caused to the Burdened Land by any defect in the Pedestrian Way/Cycle Way.

5.2. The Grantee shall indemnify and keep indemnified the Grantor against all costs, claims and/or direct losses, which the Grantor may incur in respect of:

5.2.1. any accident or damage to the Burdened Land or any chattels on the Burdened Land caused by any act or omission of the Grantee, the Grantee's employees, contractors, subcontractors or any person under the Grantee's control in connection with the exercise of any powers under this Instrument, including any damage arising as a result of the bringing of plant or equipment or vehicles onto the Burdened Land;

5.2.2. any neglect or misuse of the Easement Area by the Grantee, the Grantee's employees, any person under its control or any use of the Pedestrian Way/Cycle Way by any member of the public or in exercising rights under this Instrument; and

5.2.3. the Grantor remedying any breach by the Grantee of any of its obligations under this Instrument.

5.3. Nothing in this instrument requires the Grantor to contribute to the cost of the improvement of the existing path within the Easement Area or the establishment of the Pedestrian Way/Cycle Way.

5.4. Clause 11 of Schedule 5 of the Land Transfer Regulations 2018 is specifically recorded as being of no application to this grant. The Grantee shall, subject to clause 5.6 of this instrument, be solely responsible for the repair and maintenance of the Pedestrian Way/Cycle Way and for any further improvements that it may wish to install on or around the same including, but not limited to, lighting and for the associated costs of such work and to keep the Pedestrian Way/Cycle Way in good order and to prevent it from becoming a danger or nuisance.

5.5. The Grantee acknowledges that the rights and powers granted by this instrument together with the Grantee’s use of the Easement Area and right of entry onto the Burdened Land are not exclusive to the Grantee and are shared in common with the Grantor, the Grantor’s invitees and all other persons to whom the Grantor has or may grant similar rights.

Annexure Schedule

Insert instrument type

Easement

Continue in additional Annexure Schedule, if required

5.6. The Grantee acknowledges that other easement rights to other persons have been, or may at any time in the future be, registered against the Burdened Land provided always that any future easements so granted will not derogate from the Grantee's rights under this instrument but provided always that any future grant of rights permitting the use of the Pedestrian Way/Cycle Way will require of any grantee of such rights that they contribute to the costs of maintenance of the Easement Area proportionate to their use of that part of the Easement Area that such grantee uses.

6. Use of Easement Area

6.1. The parties acknowledge that the use of the Easement Area as a Pedestrian Way/Cycle Way, will not in itself be a breach of any of the terms of this Instrument.

7. Dispute Resolution

7.1. If any party has a dispute with the other in connection with this Instrument:

7.1.1. That party will promptly give full written particulars of the dispute to the other.

7.1.2. The parties will promptly meet together and in good faith and try to resolve the dispute.

7.1.3. If the dispute is not resolved within 14 days of written particulars being given (or any longer period agreed to by the parties) the dispute will be referred to mediation.

7.1.4. A party must use the mediation procedure to resolve a dispute before commencing any other dispute resolution proceedings.

7.1.5. The mediation will be conducted by a LEADR panel mediator chosen by the parties or, if they cannot agree, by the President of the New Zealand Law Society or the President's nominee.

7.1.6. If the dispute is not resolved by mediation the parties will refer the dispute to a single arbitrator.

7.1.7. The single arbitrator will be chosen by the parties or, if they cannot agree, by the President of the New Zealand Law Society, or the President's nominee.

7.1.8. The arbitration will be conducted in accordance with the Rules in Schedules 1 and 2 of the Arbitration Act 1996.

7.1.9. The parties must always act in good faith and cooperate with each other to promptly resolve any dispute.

Annexure Schedule

Insert instrument type

Easement

Continue in additional Annexure Schedule, if required

7.1.10. The procedures and time frames for any mediation or arbitration will be fixed by the mediator or arbitrator (as appropriate) if the parties cannot agree.

7.1.11. The parties must continue to comply with their obligations under this document during the dispute resolution process.

Appendix D
Waipu Golf Club Comittee Response to Proposal

WSP New Zealand Limited

PO Box 553

Whangarei 0140

1st November 2021

Waipu Golf Club Incorporated

PO Box 76

Ruakaka 0151

waipu@golf.co.nz

By Email: jon.craven@wsp.com

Dear John

Proposed Bream Bay Cycle and Walk Way

At our recent meeting, with our Grounds Committee, discussions centred on access and health and safety issues and how these may or may not affect the Waipu Golf Club (the Club). This letter is an initial attempt to clarify some matters, offer suggestions and possibly provide some enlightenment to both yourselves and the WGC.

The WGC is not averse to the concept of the cycle/walkway and agrees that whenever possible users should have some rest or entertainment from the trail in whatever form. The Clubs Café is one of those possibilities as discussed and the Club is not averse to this idea/concept.

The issues of suitable walk and ride tracks need further thought as it is supposed that one of the basic requirements is no intermingling of vehicle traffic and trail users. To this end the present entrance road would have to be augmented by a new trailway running (if possible) parallel to the present entrance way. Any such entrance in that area would also run parallel to the Par 3 13th hole which could place users in danger of wayward ball strike obviously to be avoided.

This then brings into play the Club losing some ground around the entrance way and practice area which is not in the Club's favour. It also makes the health and safety issues of stray practice balls creating a danger to trail users. The Club has had a policy for a number of years that does not allow for fencing that might impinge upon the views and general outlook and composition of the Club's grounds. Any kind of protective fence would impinge upon this rule and would not be sanctioned by the Club.

Once the entrance way is overcome then the carpark area will need redesigning for cycles and walkers to prevent traffic dangers. This would have to follow the present roadway but require new works at the carpark to the clubhouse. Again, the Club is not keen to lose grounds. At present during busy golfing periods (tournaments and weekends) the carpark is at capacity so a solution would be required. The clubhouse facilities are designed with a maximum use in accordance with our membership and while the Clubs Café would benefit (as an independent contractor) the Club facilities such as toilets for example would need enhancing.

The Club presently holds a Liquor license with all the requirements to ensure compliance in all respects of the law. These requirements are strict and policed and introducing the public to the facilities would create issues both lawful and management centric which could prove impossible under the present requirements.

As the trail leaves the carpark and clubhouse area it would run south parallel to the 9th hole fairway and again it would involve the Club losing ground and placing trail users in a dangerous situation in respect to wayward golf ball strike, especially as they (in going south) will be travelling into golf balls coming in the other direction. The Club does not see a ready solution to this problem.

The Club feels that security would also be an issue especially during non-working hours. The Club facilities are remote from any road or other places which might provide security and while some security items are in place it is considered these would be inadequate if trail users could access the grounds on a 24/7 basis. The Club also has substantial machinery which is stored adjacent to the prospective trail. There is also diesel and chemical storage facilities which at this time have suitable safety facilities keeping unwanted access at bay. Any increase in foot or cycle traffic in the area would have to prompt a review of these issues.

The Club in the next year is about to spend in excess of a million dollars in enhancing fairway watering. This will greatly improve both the playing and scenic experience and is expected to greatly enhance the Club's usage and revenue with the consequent increase in associated traffic. The Club is presently judged as the 27th best golf club in New Zealand and once the new watering system is installed this can only increase the Club use by visiting players.

Given the issues discussed here the Club cannot see how the Club and the trail could co-exist. The Club is ready to listen to any ideas or help if it is feasible in respect to Club operations and look forward to being kept informed of developments.

Yours sincerely

Dave Wistrand

Secretary –Grounds committee

Waipu Golf Club

On behalf of the Board

Waipu Golf Club Inc

Appendix E
Spade Readiness: Construction Risk Assessment

Section	Address/Location	Owner	Length (m)	Buildability	Cost	Route Security	Benefits (Transport/tourist)	Community Lead	Stake Holder Support	Rating
Waipu to bridge	54 The Centre, Waipu	Whangarei District Council	42	Requires installation of signs only		Existing car footpath	Access for local walking and cycling around town	Managed through NTA & WDC	Local residents	Green
Waipu to bridge	54 The Centre, Waipu	Whangarei District Council	240	Requires installation of signs only		Existing shared path	Access for local walking and cycling around town	Managed through NTA & WDC	Local residents	Green
Waipu to bridge	54 The Centre, Waipu	Whangarei District Council	240	Requires installation of signs only		Existing shared path	Access for local walking and cycling around town	Managed through NTA & WDC	Local residents	Green
Waipu to bridge	Legal road (Halifax Drive)	Road Reserve	80	Requires installation of signs only		Existing footpath/road path	Access for local walking and cycling around town	Managed through NTA & WDC	Local residents	Green
Waipu to bridge	Lot 108 DP 525820	Whangarei District Council	240	Requires installation of signs only		Existing shared path	Access for local walking and cycling around town	Managed through NTA & WDC	Local residents	Green
Waipu to bridge	Lot 128 Deposited Plan 557012	Whangarei District Council	507	New metal track to be constructed. Consider concrete SUP long term		Land is managed by WDC and borders onto new development. Waipu River esplanade reserve	Good access benefit for local walking and cycling around town.	Too central for community lead. Will likely require higher quality path. Recommend WDC to lead	Support from community. Affects property owners adjacent to trail	Green
Waipu to bridge	Lot 20 Deposited Plan 498746	Whangarei District Council	125	New metal track to be constructed. Consider concrete SUP long term		Land is managed by WDC and borders onto new development. Waipu River esplanade reserve	Good access benefit for local walking and cycling around town.	Too central for community lead. Will likely require higher quality path. Recommend WDC to lead	Support from community. Affects property owners adjacent to trail	Green
Waipu to bridge	Lot 100 Deposited Plan 496125	Whangarei District council	450	New metal track to be constructed. Consider concrete SUP long term		Land is managed by WDC and borders onto new development. Waipu River esplanade reserve	Good access benefit for local walking and cycling around town.	Too central for community lead. Will likely require higher quality path. Particularly with the join onto the exiting concrete.	Support from community. Affects property owners adjacent to trail	Green
Waipu to bridge	Lot 102 Deposited Plan 496125	Whangarei District council	62	Uses existing path leading to the road. This could be widened in the future.		Existing path may need widening. Will require concrete to meet existing.	Good access benefit for local walking and cycling around town.	Too central for community lead. Will likely require higher quality path. Particularly with the joint onto the exiting concrete.	Support from community. Affects property owners adjacent to trail	Green
Waipu bridge crossing	Legal road 119473 Nova Scotia Drive	Road Reserve	120	Building will be difficult through this section. One of the main problems for this section is the narrowness of the bridge.		Falls within the road corridor.	Provides access to the beach via Tip road	Too complex for community driven approach	Need approval from RCA for work within road corridor	Red
Waipu bridge crossing	Legal road 119471 bridge to roadside berm Nova Scotia Drive	Road Reserve	75	Building will be difficult through this section. One of the main problems for this section is the narrowness of the bridge. Requires road crossing to be constructed under NTA management		Falls within the road corridor.	Provides access to the beach via Tip road	Too complex for community driven approach	Need approval from RCA for work within road corridor	Red
Nova scotia to Uretiti Road	Legal road 119471 roadside berm to edge of 136 Nova Scotia Drive	Road Reserve	186	Building should be simple through this section, but may need some reshaping of the table drainage on the roadside relocation of property boundary fence.	$997,590.00	Falls within the road corridor.	Provides access to the beach via Tip road	Community driven with support from WDC	Need approval from RCA for work within road corridor. Adjacent property owners affected	Orange
Nova scotia to Uretiti Road	Outside 136 Nova Scotia Drive	Road Reserve	55	The road reserve narrows outside 136 Nova Scotia Drive. This will make it difficult to fit the cycle way in with the deep table drain. Relocate boundary fence.		Falls within the road corridor. May have some difficulty with adjacent land owner and property access	Provides access to the beach via Tip road	Community driven with support from WDC	Need approval from RCA for work within road corridor. Adjacent property owners affected	Orange
Nova scotia to Uretiti Road	Outside 136 Nova Scotia drive to Uretiti Road	Road Reserve	450	Some difficulty likely on the corner, with the usable width getting much lower. One large under road table drain/Culvert will need to be crossed.		Some of the Road reserve property appear to be currently being used by the farmers. This means that the fence will likely need to be moved so that the road reserve can be used.	Provides access to the beach via Tip road	Community driven with support from WDC	Need approval from RCA for work within road corridor. Adjacent property owners affected	Red
Uretiti Road	Start of Uretiti Road to 105 Uretiti Road	Road reserve	800	If the fence can be moved from the road reserve, then the path will be easily constructed.		Some difficulty with construction. Survey will need to be completed to confirm that the farm fence is in the road reserve. Table drain will otherwise need to be put into a culvert. Last 130m has sufficient space for the path within the shoulder.	Provides access to the beach via Tip road	Community driven with support from WDC	Need approval from RCA for work within road corridor. Adjacent property owners affected	Orange
Uretiti Road		Road reserve	110	Sufficient space on the roadside for the path			Provides access to the beach via Tip road	Community driven with support from WDC	Need approval from RCA for work within road corridor. Adjacent property owners affected	Orange
Uretiti Road	Opposite 80 Uretiti Road. Lot 1 Deposited Plan 503241	Road reserve	Point	Road reserve gets very close to the edge of the carriageway at this point. May need to consider construction alongside the carriageway. Fence will need to be moved and culvert extended to road reserve boundary		Falls within the road corridor.	Provides access to the beach via Tip road	Too complex for community driven approach	Need approval from RCA for work within road corridor. Adjacent property owners affected	Red
Uretiti Road	Opposite 80 Uretiti Road to Tip Road	Road Reserve	80m	No obvious issues with build ability.		Falls within the road corridor.	Provides access to the beach via Tip road	Too complex for community driven approach	Need approval from RCA for work within road corridor. Adjacent property owners affected	Orange
Tip Road	Start of Tip Road to end of Lot 4 Deposited Plan 144388	Road reserve	240	Shoulder is currently quite narrow, with limited space between the fence and the table drain. Farmers fence will need removing, and then it is easily buildable.		Falls within the road corridor, but the farmers fence is in the wrong place - using a significant portion of the road reserve. This will need to be moved to gain sufficient land area.	Provides access to the beach via Tip road	Too complex for community driven approach	Need approval from RCA for work within road corridor	Orange
Uretiti scenic reserve	Uretiti scenic reserve	Government	1100	Ground is very sandy, so will need to be built accordingly. This route will also need to maintain vehicle access as this is the pipe line track.		This will need approval from the owners of the pipe line as it will be on their easement.	Access to Ruakaka/beach	Community driven with support from WDC	Would need consent from DOC and approval from First Gas for construction within pipeline easement	Orange

Section	Address/Location	Owner	Length (m)	Buildability	Cost	Route Security	Benefits (Transport/tourist)	Community Lead	Stake Holder Support	Rating
Waipu Golf course	3229 State highway 1, Waipu Section 31 Blk XIV Ruakaka SD	The Waipu Golf Club (incorporated)	400	Follows along the existing fairway (this may be a danger to cyclists?). Should be easily constructed by laying down metal		This will require the golf courses approval .	Access to Ruakaka/beach. Stopping point for cyclists at the clubhouse.	This section could easily be managed by the community with support from the golf course.	Will need support from the golf course. This may be difficult at the track would run alongside one of the holes.	Red
Waipu Golf course	3230 State highway 1, Waipu Section 31 Blk XIV Ruakaka SD	The Waipu Golf Club (incorporated)	560	Follows along the pre existing golf course access road/driveway. This could be used for cycling, or put a small gravel path on one side		This will require the golf courses approval .	Access to Ruakaka/beach. Stopping point for cyclists at the clubhouse.	This section could easily be managed by the community with support from the golf course.	Will need support from the golf course.	Red
Waipu Golf course	3231 State highway 1, Waipu Section 31 Blk XIV Ruakaka SD	The Waipu Golf Club (incorporated)	220	Follows around the outside the northern most hole of the gold course. This should be easily built by the community with gravel		This will require the golf courses approval .	Access to Ruakaka/beach. Stopping point for cyclists at the clubhouse.	This section could easily be managed by the community with support from the Golf Course.	Will need support from the Golf Course. Currently the committee is not in support unless their safety issues can be addressed.	Red
Waipu Golf Course to Uretiti camp ground	Section 8 survey Office Plan 461691	Government owned	730	Follows pipeline track. Consolidated sand subgrade, trail to be constructed with aggregate	$803,580.00	This will need approval from t he owners of the pipe line as it will be on their easement.	Access to the camp ground/beach	Community driven with support from WDC	Would need consent from DOC and approval from First Gas for construction within pipeline easement	Orange
Uretiti camp ground to Allotment 92-93 Parish of Ruakaka	Area Q Survey office plan 461691	Government owned	680	Follows pipeline track. Consolidated sand subgrade, trail to be constructed with aggregate		This will need approval from t he owners of the pipe line as it will be on their easement.	Access to the camp ground/beach/Lake	Community driven with support from WDC	Would need consent from DOC and approval from First Gas for construction within pipeline easement	Orange
Allotment of 92-93 parish to Ruakaka	Section 5 Survey Office plan 461692	Government owned	350	Follows pipeline track. Consolidated sand subgrade, trail to be constructed with aggregate		This will need approval from t he owners of the pipe line as it will be on their easement.	Access to the camp ground/beach/lake	Community driven with support from WDC	Would need consent from DOC and approval from First Gas for construction within pipeline easement	Orange
Allotment of 92-93 parish to Ruakaka	Section 5 Survey Office plan 461693	Government owned	500	Follows pipeline track. Sandy terrain		This will need approval from t he owners of the pipe line as it will be on their easement.	Access to the camp ground/beach/lake	Community driven with support from WDC	Would need consent from DOC and approval from First Gas for construction within pipeline easement	Orange
Allotment of 92-93 parish to Ruakaka	Section 5 Survey Office plan 461694	Government owned	1600	Follows pipeline track. Consolidated sand subgrade, construct trail with aggregate. Needs vegetation clearance.		This will need approval from t he owners of the pipe line as it will be on their easement.	Access to the camp ground/beach/lake	Community driven with support from WDC	Would need consent from DOC and approval from First Gas for construction within pipeline easement	Orange
Ruakaka Residential Area	Lot 72 DP 185703	Whangārei District Council	60	Follows the existing walking track. May need to expend the track and top up with metal on the ground		Land is owned by Whangārei District council. The walking track is currently used by the residents.	Access from the government owned pipeline track to Ruakaka residential area	Community driven with support from WDC	Will work better with support from alongside development/community	Green
Bream Bay Drive to Marsden Point Road	Bream Bay Drive	Road Reserve	1120	Short term route proposes the cyclists to share the existing road (Bream Bay Drive) with the road users		Falls within the road corridor.	Connecting Waipu to Ruakaka town	NTA lead	Need approval from RCA for work within road corridor	Green
Bream Bay Drive to Marsden Point Road	Ruakaka Beach Road	Road Reserve	390	Short term route proposes the cyclists to share the existing road (Ruakaka Beach Road) with the road users. One of the main concerns for this section is the narrowness of the bridge at RAMM Displacement 250 - 275		Falls within the road corridor.	Connecting Ruakaka residential area to Ruakaka township	NTA lead	Need approval from RCA for work within road corridor	Green
Bream Bay Drive to Marsden Point Road	Camellia Avenue	Road Reserve	135	Cyclists proposed to share existing road (Camellia Avenue) with motorists. At the north end of the Camellia Avenue, the cyclists to share a short section of footpath to detour around the fence		Falls within the road corridor.	Connecting Ruakaka residential area to Ruakaka township	NTA lead	Need approval from RCA for work within road corridor	Green
Marsden Point Road	Marsden Point Road	Road Reserve	3280	Cycle lane to be provided along the road shoulder. Most of the sections have wide shoulder width to provide enough cycle lane width, however, some sections may need width expansion in long term plan (remarking the traffic lines and installing hit sticks). Some crossing points across Marsden Point Road are designed and provided by WSP. One of the main concerns for this section is the bridge along Marsden Point Road at RAMM Displacement 3295 - 3370m. WSP recommend cyclists to share the existing footpath in the short term plan. Appropriate traffic signage to be installed.	$47,360.00	Falls within the road corridor.	Connecting Ruakaka residential area to Ruakaka township	NTA lead. Existing road shoulder and footpath will be shared between motorists and cyclists. Changes to the road marking is too complex for a community driven approach. Will need to be funded by WDC, with approved design.	Need approval from RCA for work within the road corridor.	Red

Section	Address/Location	Owner	Length (m)	Buildability	Cost	Route Security	Benefits (Transport/tourist)	Community Lead	Stake Holder Support	Rating
Peter Snell Road to Pipe Line Track	Peter Snell Road	Road Reserve	220	Cycle lane merges to the existing footpath at the intersection of Peter Snell Road and Marsden Point Road (require footpath expansion). WSP proposed crossing design across Peter Snell Road connecting Ruakaka shop and Bream Bay School. The crossing design is considered by WDC as a part of Raised Priority Pedestrian Crossing. Appropriate traffic signage to be installed	$998,640.00	Falls within the road corridor.	Connecting Ruakaka residential area to Ruakaka township	NTA lead. Existing road shoulder and footpath will be shared between motorists and cyclists. Road shoulder expansion may be too complex for community driven approach	Need approval from RCA for work within the road corridor.	Green
Peter Snell Road to Pipe Line Track	Takutai Place	Road Reserve	80	Cyclists proposed to share existing road (Takutai Place) with motorists. Appropriate traffic signage to be installed		Falls within the road corridor.	Connecting Ruakaka township to Marsden Point	Existing road shoulder and footpath will be shared between motorists and cyclists.	Need approval from RCA for work within the road corridor.	Green
Peter Snell Road to Pipe Line Track	Lot 2 DP 551273	Whangārei District Council	300	Cycle lane goes through Ruakaka Recreation Centre carpark and through the west side of the recreation reserve. This route will require a new metal track and appropriate signage		Land is owned by Whangārei District council.	Connecting Ruakaka township to Marsden Point	This could be completed by the community, assuming that a boardwalk or heavy excavation is not needed.	Will work better with support from Recreation Centre/Reserve users (e.g. Sports club)	Green
Peter Snell Road to Pipe Line Track	Sime Road	Road Reserve	620	Crossing proposed for Sime Road with appropriate traffic signage. Cycle trail is proposed on the northern berm of Sime Road, requires a metal track to be constructed		Falls within the road corridor.	Connecting Ruakaka township to Marsden Point	Too complex for community driven approach	Need approval from RCA for work within the road corridor.	Green
Ruakaka Pipeline Road Track	West of Lot 2 DP 478281 Section 2 SO 461691 Section 65 Block VII Ruakaka SD Section 1 SO 461691	Whangārei District Council	3500	Follows pipeline track for the most part. Appears to be partially unstable sand but proposal is to construct with metal track and geotextile underneath. Sand movement due to wind may create ongoing maintenance of the trail. Some sections may require further geotechnical advice for construction on unstable sand.		This will need approval from the owners of the pipe line as it will be on their easement.	Connecting Ruakaka township to Marsden Point This route is being used by recreational 4WD vehicles, which we may have to address in the future (track sharing between 4WD and cyclists/pedestrians) Good access benefit for local walking and cycling around town	Community driven with support from WDC	Would need approval to use the easement area from the refinery/pipeline managers	Orange
Ruakaka Pipeline Road Track to Marsden Marina Cove	Mair Road	Road Reserve	890	Cycle lane is proposed on the side of Mair Road or on the existing road. This will require construction of a metal track on the berm. At the intersection of Mair Road and Marsden Highway, overhead powerlines and streetlight may be an issue		Falls within the road corridor.	Connecting Ruakaka township to Marsden Point	Too complex for community driven approach	Need approval from RCA to be in road corridor	Orange
Ruakaka Pipeline Road Track to Marsden Marina Cove	State Highway 15 North of Part Allot 83 PSH OF Ruakaka, Lot 1 DP 56387 and Part Lot 1 DP 54730	Waka Kotahi	960	Cycle lane is proposed on the side of Marsden Highway. Metal track to be constructed on the grass berm. Some vegetation trimming may be required. Overhead power lines present. Crossing proposed for SH15 Port Marsden Highway, which involves traffic signage and island installation. Waka Kotahi is generally in support of the proposal. Design approval is required.		Falls within the road corridor.	Connecting Marsden Point Refinery to Marsden Marina Cove Proposing safer cycle lane away from a high speed road environment	Too complex for community driven approach, work within SH corridor.	Approval from Waka Kotahi	Red
Ruakaka Pipeline Road Track to Marsden Marina Cove	Marsden Bay Drive	Local Road Reserve	980	Cycle lane is proposed on the side of Marsden Highway. Overhead power lines and street light present New gravel/metal road to be installed considering water table and relocation of the fence.	$619,600.00	Falls within the road corridor.	Connecting Marsden Point Refinery to Marsden Marina Cove	Too complex for community driven approach, requires enabling works.	Need approval from RCA for work within the road corridor.	Red

Section	Address/Location	Owner	Length (m)	Buildability	Cost	Route Security	Benefits (Transport/tourist)	Community Lead	Stake Holder Support	Rating
Ruakaka Pipeline Road Track to Marsden Marina Cove	Lot 803 DP 376145	Whangārei District Council	350	Proposed cycle lane goes over the water drain located west of Marsden Point Drive. This may require a construction of boardwalk or extending the existing box culvert. The track also use the existing bridge, which may require a traffic signage installation. Along the proposed route, metal track upgrades, and signage installation. Road crossing required for connection to the Marina.		Land is owned by Whangārei District Council	Connecting Marsden Point Refinery to Marsden Marina Cove Good access benefit for local walking and cycling around town.	Too complex for community driven approach, requires enabling works.	This will require agreement from Marsden Maritime Holdings for shared use of the accessway into the boat storage yard.	Red
Ruakaka Pipeline Road Track to Marsden Marina Cove	Rauiri Drive	Road Reserve	53	Crossing point to be proposed across Rauiri Drive in the future. The short term cycle route is proposed to share footpath with pedestrians		Falls within the road corridor.	Connecting Marsden Point Refinery to Marsden Marina Cove	Existing Road and footpath will be shared between motorists/pedestrians and cyclists	Need approval from RCA to be in road corridor	Red

Appendix F
Electronic User Activated Cycle Signs Technical Note

TECHNICAL NOTE

TRIAL OF VEHICLE ACTIVATED ELECTRONIC SIGNS FOR IMPROVED DRIVER AWARENESS AT KNOWN CRASH SITES IN TASMAN AND MARLBOROUGH DISTRICTS

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ABSTRACT:

This technical paper discusses a recent trial of electronic vehicle activated permanent warning signs installed at sites in Tasman and Marlborough Districts during mid 2009.

In Tasman, electronic bridge cycle warning signs designed to activate as cyclists ride over a sensor were installed for the first time in New Zealand at Appleby Bridge. In Marlborough, three high risk out of context curves were treated with vehicle activated curve warning signs. The signage has been operational since June/July 2009.

It was hypothesised that the installation of the signage would be associated with a reduction in crashes on the curves and an improvement in the comfort and safety of cyclists using the bridge.

It is recommended that, as the signage has only been operational for a short period, further monitoring of the sites and data collection be carried out to assess the effectiveness of this type of technology on driver behaviour and crash incidence.

INTRODUCTION:

NZ Transport Agency (NZTA) Region 10 covers the top of the South Island and includes the Marlborough, Nelson and Tasman Districts.

The opportunity to deploy electronic road safety signs through a national safety funding initiative arose and funding was approved for the proposed trial. The following types of electronic signs were planned for installation:

- Speed indication devices (SIDs)
- Cycle activated cyclist warning signs
- Vehicle activated curve warning signs
- Time specific rural school warning signs

This technical note will focus on two specific types of electronic signage deployed across the region:

- Tasman District:
    - SH60, Appleby Bridge - cycle activated cyclist warning signs.
- Marlborough District:
    - SH1, Dazzle Corner - vehicle activated curve warning signs.
    - SH1, Butter Factory Corner, Riverlands - vehicle activated curve warning signs.
    - SH6, Pak Lim's Corner, Renwick - vehicle activated curve warning signs.

Figure 1: Cycle activated cyclist warning sign (left), vehicle activated curve warning sign (right).

Two case studies, SH60 – Appleby Bridge and SH1 – Butter Factory Corner, are used as the basis for the discussion.

DISCUSSION:

Case Study 1: SH60 Appleby Bridge

Appleby Straight is a blackspot section of SH60 located to the north of Nelson. It has had 4 fatal crashes over the last five years 2005 to 2009, with a five year annual average crash social cost of $3 million. This section of highway is an identified Network Safety Co-ordination (NSC) site and has been a focus for crash reduction work in the region.

The Appleby State Highway Bridge is 230m long and is 7.3m wide and carries over 12,000 vehicles per day. The bridge has concrete side rails with a 200mm non-mountable vertical kerb face. The approaches have lead in w-section safe barriers for 100m and variable width shoulders between 1m to 2m.

The constrained space on the bridge does not reduce the average vehicle speed when a cyclist is in the lane, and the bridge has an 85% speed of 85km/h regardless of whether or not a cyclist is present.

Table 1: Appleby Bridge Data

Annual Average Daily traffic (AADT): 12,000 veh/day	Cycle Volume: 140 cyclist/day
Heavy Vehicles (HCVs): 7%	Bridge Width: 7.3
Speed Limit : 85km/hr	Posted Speed Limit: 100km/hr

While there was no previous crash history related to cyclists using the narrow 7.3m wide Appleby Bridge situated just prior to the Appleby Straight, the regional cycle strategy identifies the Appleby Bridge as an impediment to peri-urban commuter and recreational cycling and the site was highlighted as the number one priority for State Highway improvements.

A capital project was investigated involving retro-fitting clip-on bridge cycle lanes but the estimate of $1.4 - $2 million (NZ) made it impossible to economically justify the project so alternative safety improvements were investigated.

It was decided to proceed with cycle warning sign to alert both cyclists and vehicles to the cycle pinch point. However conventional static permanent warning signage, even with over-sized backing boards, was not considered sufficient. Real time warning signs, which were activated only when cyclists were using the bridge, were considered the best option.

There was an expectation that, if vehicle drivers were made aware of a cycle in the immediate vicinity as they were driving over the bridge, they would slow to a speed that allowed them to follow a cyclist on the bridge rather than crossing the centreline and passing whether or not there was a vehicle in the opposing lane.

Speed surveys, cycle counts and videos of driver behaviour were undertaken prior to any improvement work at this site.

Cycle Sign Design

Using known technology of electronic flashing light signs attached to permanent warning signs with manual push button or light beam trigger systems as a starting point, a user activated system was investigated.

Recently in New Zealand school zone signs have been developed - time period activated signs which are normally blank and light up with a school zone message during school drop-off and collection time periods. Using this same activated electronic sign approach, an electronic cycle sign with corner flashing lights was developed, approved and legalised for highway use.

The next challenge was developing a suitable detection system. Two options were considered, a signal detector loop and manual push button for the cyclist. It was considered that, with the cycle volume at this site, cyclists would not be prepared to slow down to use a push button. Initially it was proposed to use standard signal detector induction loops placed on a widened shoulder and to direct cyclists to drive over the point on the shoulder of the

road marked with green paint. The cost to install these loops, with seal widening works and green paint and marking was in excess of $20,000 (NZ). Also a significant amount of signage would be required which, it was considered, would detract from safety.

An alternative detection system, the eco-counter, was selected. This could detect cyclists in the main vehicle stream. The system had an added advantage of being a continuous cycle counter. The loops had not been used to trigger an electronic sign before and required software to be designed to convert the count signal back to an electronic switch signal.

The final system development was site testing of time period for display, spacing of loop to sign position and selection of sign operation in both directions or in the direction of travel.

It was decided to space the loop 30m prior to the sign to allow approaching cyclists to cross the loop and see the sign activated before crossing the bridge, allowing them a level of confidence that the system is working. The system is currently only activated in the direction of travel.

Case Study 2: SH1 Butter Factory Corner

Butter Factory Corner is an intersection on State Highway 1, located to the south of Blenheim in the suburb of Riverlands. The intersection is a 45km/h curve with a T-junction local road, Alabama Road, intersecting on the outside of the curve. The intersection is complicated by the close proximity of the national rail link and a number of residential houses, along with a primary school. There is no stacking distance for vehicles between the railway crossing and the intersection and sight distances are substandard.

The site has an AADT of approximately 7000 on State Highway 1 and 2000 on Alabama Rd with 15.6% heavy vehicles.

The intersection has had 23 crashes in the 10 year period ending 2009 and, although to date all crashes have resulted in minor or non-injury, the potential is there for a major event should a crash occur in conjunction with a passenger train. Crashes involve a range of causal factors, inattention, fatigue, too fast for corner, trucks too fast or insecure loading, swung wide on bend and failure to give way.

A crash reduction study recommended lowering the speed limit at the site from 80km/h to 70km/h and installing threshold signage. But lowering of the speed limit raises the issue of whether a lesser speed limit would be “credible”, as the crash issues relate to the isolated speed at the corner and there are open rural paddocks just a little further on from the site with 100km/h feel.

The local community have long advocated for a solution to the problems at the site. Proposals include reconstruction at the site easing the curve and installing a right turn bay to address some of the crashes, and a proposal for a localised by-pass removing the curve and the intersecting junction.

All options, except reducing the speed limit, require large funding commitments. The challenge was to find a solution that could improve the intersection and remain within a restricted budget.

The proposed solution included a mix of available tools:

- Reduce the speed limit from 80km/h to 70 km/h (completed on 27-02-09).
- Install large signage and install threshold treatment as funds become available.

- Install guardrail (thriebeam) to protect houses that had previously had crashed vehicles in their front yards (completed May 09).
- Construct shared footpath/cycle path on shoulder from railway crossing near school to safe crossing point on State Highway (completed May 09).

In addition it was decided to investigate the installation of electronic speed advisory signage on both at the curve and to the north of the site.

Winnett and Wheeler (2002) undertook a large scale evaluation of vehicle activated signs for the UK Department for Transport. In that study they found that there was a statistically significant reduction in speeds of between 1 and 14mph associated with the sign. They also found that there was a one-third reduction in accidents against a baseline of what would have been predicted over the time of the study without the signs in place. Winnett and Wheeler suggest that such signs have a greater effect than fixed signs and that there is no evidence of driver habituation to the signs, even over a period of three years.

Austroads (2008) suggests that, due to the lack of habituation of these types of signs, they may have a role to play as an anti-monotony measure. There is a tendency for fatigued drivers to lose track of their speed control on bends and these signs may incline a driver to heed the warning as the activation of the sign "engages" them.

This research suggests that electronic signage has a role to play in addressing crashes relating to speed and possibly fatigue and inattention by engaging the driver with a message prior to entering the corner and it was proposed to:

- Install electronic speed advisory signs as a reminder for drivers in the 70km/h zone as they pass through the open fields (completed June 09).
- Install electronic curve advisory signs at the approaches to the corner in both directions to warn motorists and truck drivers to slow down if they are approaching the corner at speeds faster than the curve advisory on the corner (completed June 09).

Sign Installation and Monitoring

Once the decision was made to install the electronic curve advisory signage at the site, it became obvious that the position of the signs was going to be crucial to their effectiveness – placed too far out from the curve, they would be giving the "slow down" message to all vehicles and placed too close to the corner, any driver travelling too fast would not have time to brake on the straight before entering the curve.

Prior to installation, tube counters were placed for a week to collect pre-installation approach speeds at the corner. It was planned to use this data to ascertain the distance required to decrease speed to the required posted advisory speed allowing for driver reaction times.

Problems arose when siting the signage as calculated distances were not in positions where the displays could be mounted taking into account services both underground and overhead, all requiring clearances from the various utility companies. The next option was to place the signs further out from the calculated spot and increase the thresholds for activation of the sign. Several visits were made to the site and observations made of where most drivers were braking prior to the curve.

Activation of the displays is by speed-activated radar. Signs are set on three modes:

- No display – when vehicles are travelling at the curve advisory speed or less (northbound 55km/h, southbound 45km/h).

- Curve illuminated – when vehicles are travelling between the curve advisory and 10km/h (northbound >55km/h < 65km/h, southbound >45km/h < 55km/h).
- Curve illuminated and Slow Down message – when vehicles are travelling at 10km/h or more above the curve advisory (northbound < 65km/h, southbound < 55km/h).

PROJECT COSTS

Case Study 1: SH60 Appleby Bridge

The SH 60 Appleby installation total project cost inclusive of professional fees was $55,000. This cost is made up of:

- 2 Electronic signs & poles $15,000
- Power connection, surge protection and fuses (will varying on distance to power source) Solar alternative would be $1,500 per sign. $15,000
- 2xDetection loops, counter and signal controller $20,000
- Professional fees $5,000

Case Study 2: SH1 Butter Factory Corner

The SH1 Butter Factory Corner curve warning signs installation total cost was $34,990 (excl GST). This cost is made up of:

- 2 electronic speed activated curve warning signs, solar powered, poles and sockets $18,270
- Data logging option and GSM modem $2,120
- Technical installation and commissioning $1,900
- On-site warranty $400
- Traffic management, rail supervision, site installation $9600
- Professional services $2700

RESULTS:

Case Study 1: SH60 Appleby Bridge

There have been no cycle crashes since installation of the signs at Appleby which have been operational since July 2009.

A video survey of driver behaviour has been completed to evaluate the effectiveness of the cycle warning signs. The behaviour observed by vehicle drivers has been compared with video footage compiled prior to the installation. The footage shows a distinct change from that exhibited prior to installation with vehicles sitting in behind cyclists crossing the bridge, not passing whether the opposing lane was clear or not, as was the previous case. The speed surveys of vehicles were found to be too variable for reliable results.

Case Study 2: SH1 Butter Factory Corner

There have been no crashes since the installation of the signs at SH1 Butter Factory Corner in June 2009.

Tube counts were undertaken to establish 85th percentile speeds before the installation of the signs at the points where the signs were to be installed. Approach speeds to the curve were measured with the 85th percentile speed varying from 64 – 73 depending on the time of day. Tubes were not able to be installed at the curve, to check speeds as vehicles travelled

around, to evaluate whether speeds of vehicles negotiating the curve were changed. Tube counters installed again after the installation of speed activated warning signs indicated a change in the mean speeds at the approach to the site. Measured 85th percentile speeds varied from 66 – 68 km/h. The mean speed approaching the corner reduced in range with top mean speeds dropping 5km/h on the approaches after the installation of the signs.

Observations at this site, as well as the other sites in Marlborough with curve warning signs installed, show that vehicles activating the "slow down" message brake when "engaged" by the sign. Further studies are proposed in the area of driver response to the signage.

CONCLUSION

These signs will continue to be monitored for indications of their effectiveness. While there have been no crashes at any of the sites treated, it is too soon to comment on whether the signs have shown to be effective. Driver behaviours will continue to be monitored on Appleby Bridge and an effective method of measuring the speed of vehicles within the corners will be investigated.

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