Velos MCR Design Team
Opus International Consultants Ltd
12 Moorhouse Avenue
CHRISTCHURCH 8011
t. +64 3 363 5400

Memo

To: Jenny Rankin

From: John Denney

cc:

Date: October 31, 2016

Re: Rapanui – Shag Rock Section 2 and 3 – Route Selection Summary

1 Introduction

This memo is a summary of the process followed to determine the preferred and alternative routes for the Rapanui – Shag Rock Major Cycleway Route (MCR) Stage 2 and 3.

The Multi Criteria Analysis (MCA) was developed in conjunction with input from the CCC Transport Advisory Group (TAG), and the independent Safety and Network Functionality review (SANF).

The high level objectives and vision for the MCR's are:

- To encourage more residents to cycle by targeting the 'Interested but Concerned' by providing better facilities and increasing the level of safety.
- To encourage more people to cycle more often by providing an enjoyable experience and create cycle routes to suit the ability of children 10 years and over.

This will in turn help to slow down the increase in private car use and meet one of the key objectives of the Christchurch Transport Strategic Plan.

The main objectives/design principles of the MCR's are:

- Safety: Cycle routes should be safe and be perceived as safe, provide personal security and limit conflict between cyclists and other route users:
    - Consideration of volume, speed and mass differentials is key to the safety aspect of the cycleway design.
    - Design should be predictable, self-explaining and as consistent as possible across the network.
    - Consideration of adjacent land use and the nature of development (including density, commercial, industrial etc.), and how this impacts on site movements and the nature of those movements (multiple

accesses, backing out versus forward movements etc.). Appropriate levels of security need to be provided for end of trip facilities such as lighting, casual surveillance and locking systems.

- Directness: Cycle routes should be direct, based on desire lines and result in few delays door to door. Cycle parking facilities should be in convenient locations.
- Coherence and connectivity: Cycle routes should be continuous and recognisable, link all potential origins and destinations and offer a consistent standard of quality, freedom to choose a route, with alternatives if necessary for greater safety and security or sense thereof, protection and signage throughout.
- Attractiveness: Cycle routes should integrate with and complement their surroundings, enhance public security, look attractive and contribute positively to a pleasant cycling experience. They should connect with urban landmarks and places to provide both markers that reduce the perception of distance as well as make more useful cycle connections. Social safety from crime or threats of crime, and how it is perceived is a major determinant of attractiveness. Cycle parking facilities should be in convenient locations.
- Comfort: Cycle routes should be smooth, non-slip, well maintained and free of debris, have gentle slopes and be designed to avoid complicated manoeuvres and allow cyclists to feel comfortable with their position whilst riding or waiting.

Additionally, throughout the option assessment budgetary limitations, urban design improvements and minimising impacts on residents and businesses.

The routes that were considered, in the context of the study area, between the connections points at either end of the route are shown in Figure 1-1 below. The majority of the route options are along Linwood Avenue or Humphreys Drive, however alternative adjacent parallel routes were investigated where they were considered to have potential benefits.

The facility type was also considered as part of the assessment. At the end of the Route and Facility Assessment two options were taken forward for further investigation through a full Scheme Assessment and public consultation. These routes were referred to as the preferred route and alternative route.

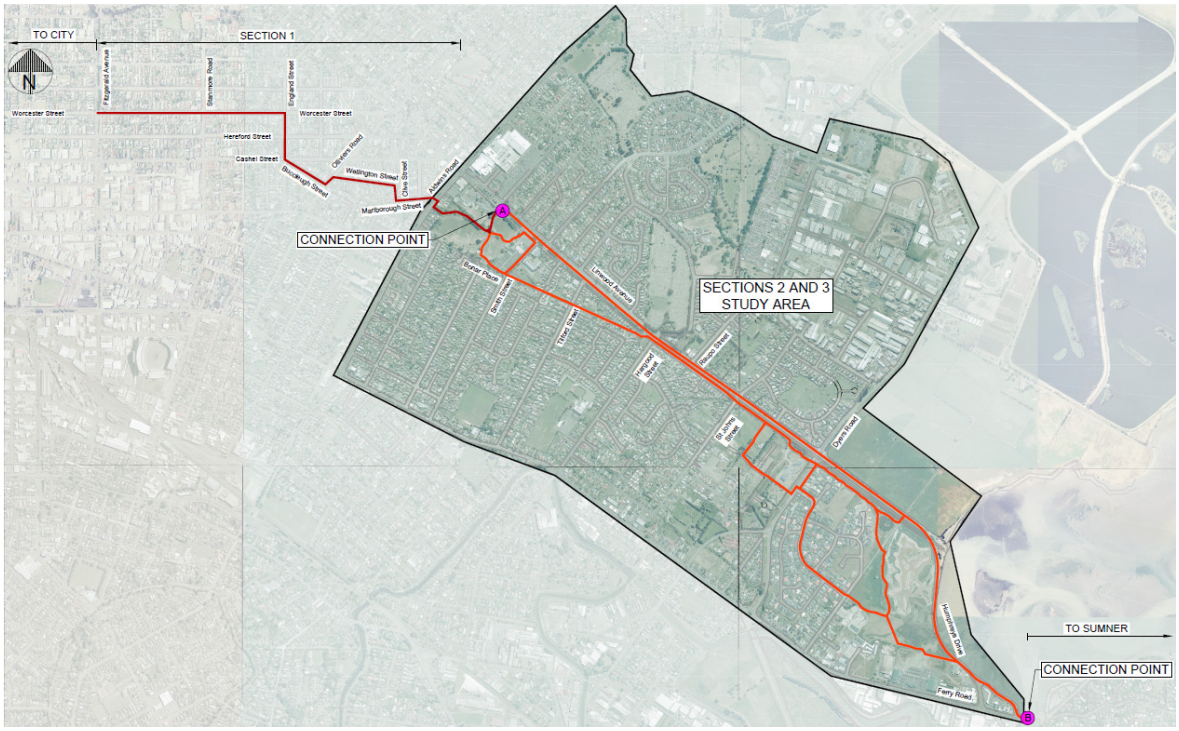

Figure 1-1: Route Alternatives

To enable measurable comparisons, through varying environments the route was broken down into six sub sections as listed below and shown in Figure 1-2:

A. Linwood Park Traverse;

B. Smith Street to Hargood Street;

C. Hargood Street to St Johns Street;

D. St Johns Street to Dyers Road;

E. Dyers Road to Charlesworth Reserve; and

F. Charlesworth Reserve to Ferrymead Bridge.

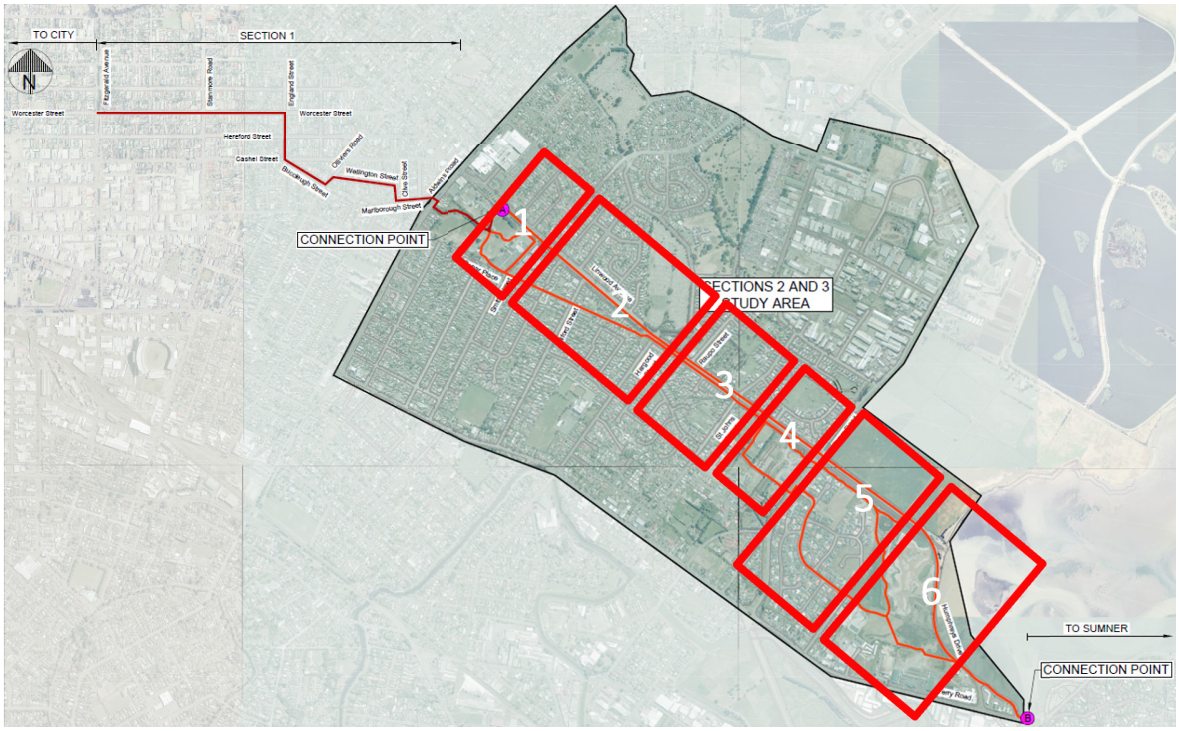

Figure 1-2: Route Sub Sections

2 Ferry Road

On 10th November 2014 a Preliminary Route Assessment was produced for the Rapanui - Shag Rock Route. On 29th January 2015 Council Officers sought adoption of the route selection report recommendations. A notable statement in this report was:

> *Initially, the route was to utilise Ferry Road, as indicated in the Christchurch Transport Strategic Plan, as the most direct route. The Ferrymead Masterplan led to the Ferry Road Corridor Study, which did not support use of Ferry Road as a MCR. Therefore, a route broadly aligned with Linwood Avenue was adopted as an alternative.*

It was resolved at a Council meeting to adopt in principle the route selection recommendations and refer the final decision to the Infrastructure, Transport and Environment Committee, noting the route selections will be subject to receiving recommendations from the affected Community Board and to full consultation then approval by the Infrastructure, Transport and Environment Committee.

The finalised route selection report delivered on 14th April 2015 went on to add that "Ferry Road had several challenges that would have resulted in safety and attractiveness of that route not meeting the objectives of the MCRs".

The Ferry Road Corridor Study stated the following:

> *One of the key issues in determining the future of the corridor is establishing if Ferry Road is to remain as a Major Cycle Route (as highlighted in the Christchurch Transport Strategic Plan). On this basis a variety of alternative potential Major Cycle Routes were workshopped with the Environment and Infrastructure Committee and Hagley Ferrymead Community Board, with the decision taken to relocate the Major Cycle Route to Linwood Avenue/Drain, with lateral connections to be provided to Ferry Road and the Heathcote River. Ferry Road would instead be designated as Local Cycle Route. This provided some direction in terms of the potential recommended generic cross sections which could be used along Ferry Road, as Local Cycle Routes do not require separation to the same degree as do Major Cycle Routes. However, it would still be necessary to ensure that the Level of Service issues which occur along the route for all modes be addressed (particularly as research undertaken indicates that a number of cyclists would continue to use Ferry Road, even when Linwood Avenue/Drain would operate as the Major Cycle Route).*

Based upon this series of decisions made by Council in consultation with the Community Board, Ferry Road has not been investigated as a viable alternative as part of this route assessment.

3 Section A Options – Linwood Park Traverse

The black route shown in Figure 3-1 below is a shared path, which is programmed to be constructed in late 2016, as part of Rapanui - Shag Rock Section 1:

- Red route - bi-directional separated cycle path on the north side of Linwood Avenue;
- Light blue route - Shared path in the Linwood Avenue central raised median;
- Light green route - bi-directional separated cycle path on the south side of Linwood Avenue;
- Light yellow route - one way separated cycle paths on the north side and south side of Linwood Avenue adjacent to the median;
- Yellow route - one way separated cycle paths on the north side and south side of Linwood Avenue adjacent to the footpath;
- Orange route - shared path through Linwood Park to a bi-directional separated cycle path on the west side of Smith Street;
- Dark blue route - shared path through Linwood Park to a bi-directional separated cycle path on the east side of Smith Street; and the
- Dark green route - shared path through Linwood Park exiting at the north eastern corner next to the tennis courts.

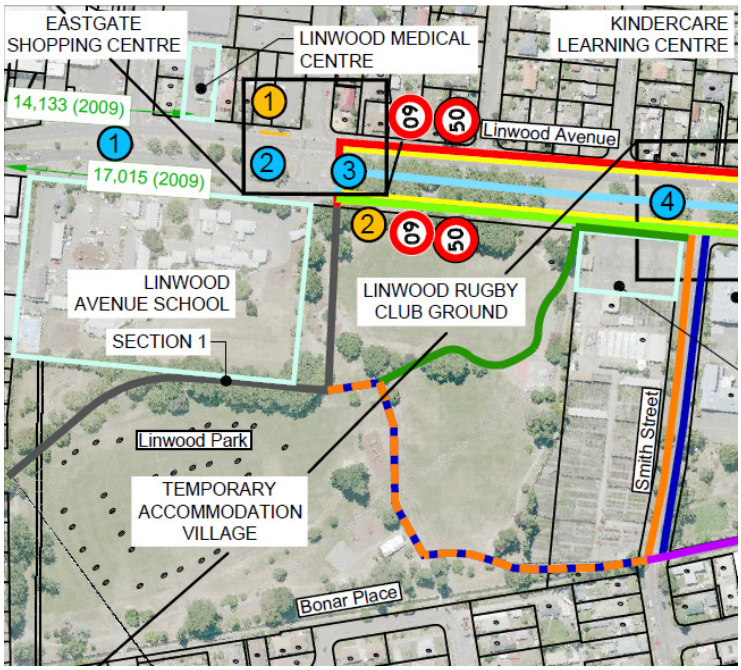

Figure 3-1: Section A Route Options

The preferred route is the light blue route and the alternative route is the light yellow route:

3.1 Preferred Route

3.1.1 Light blue route

The preferred option in Section B has dictated Section A. Section B is 750m as opposed to 250m for Section A; however Linwood Avenue has a similar cross section in both sections and as such a consistent design would produce a coherent route. For both Sections A and B the light blue route is the preferred option; however in order to reduce the risk of damage to the existing trees relatively expensive mitigation using porous paving would be required. When considering all of the key criteria the safety, comfort and attractiveness of the light blue route are significantly better than the light yellow route and therefore would encourage greater volumes of interested but concerned cyclists. Avoiding on-street parking removal required for the light yellow route is expected to be favourable to the local community.

3.2 Alternative Route

3.2.1 Light yellow route

The alternative light yellow option of separated cycle lanes adjacent to the median was considered by the Safety and Network Functionality audit to be "unconventional and a cause of uncertainty". It is considered that the "uncertainty" of the median side cycleway could be reduced through careful design.

3.3 Discounted Routes

3.3.1 Red route

A significant safety risk with the red route would be that westbound cyclists on the bi-directional cycle facility would cross two side roads. Traffic from the side road would expect to only give way to the right as traffic is only travelling one way. This would create an increased risk of a cyclist/vehicle collision.

3.3.2 Light green route

There is a significant amount of activity between the Linwood Park frontage and the on-street parking which would cause delays to cyclists and risk of collisions, particularly during sporting events.

3.3.3 Yellow route

The yellow route was considered to be less favourable than the light yellow route as locating separated cycle lanes adjacent to the footpath would have impacts on parking and would have increased safety concerns due to interaction with side roads, driveways and parked car doors.

3.3.4 Orange and dark blue routes

The orange and dark blue routes would travel along the south edge of Linwood Park, which is currently an isolated and threatening area. There would be limited natural surveillance. Crime prevention measures could be implemented to improve the perception of personal safety, however these routes are indirect unless the route in the next section was to go along the Linwood Drain.

3.3.5 Dark green route

The Dark Green route cutting across Linwood Park in Section A scored highly; however it would require an additional signalised crossing on Linwood Avenue (to connect to the Linwood Avenue median in Section B) and does not utilise the new shared path in Linwood Park connecting to Linwood Avenue.

4 Section B Options – Smith Street to Hargood Street

In order to connect between Smith Street and Hargood Street the following 6 options were considered:

- Red route - bi-directional separated cycle path on the north side of Linwood Avenue;
- Blue route - shared path in the central raised median of Linwood Avenue;
- Green route - bi-directional separated cycle path on the south side of Linwood Avenue;
- Light yellow route - one way separated cycle paths on the north side and south side adjacent to the median on Linwood Avenue; and
- Yellow route - one way separated cycle paths on the north side and south side adjacent to the footpath on Linwood Avenue;
- Purple route – shared path along Linwood Drain (existing footpath).

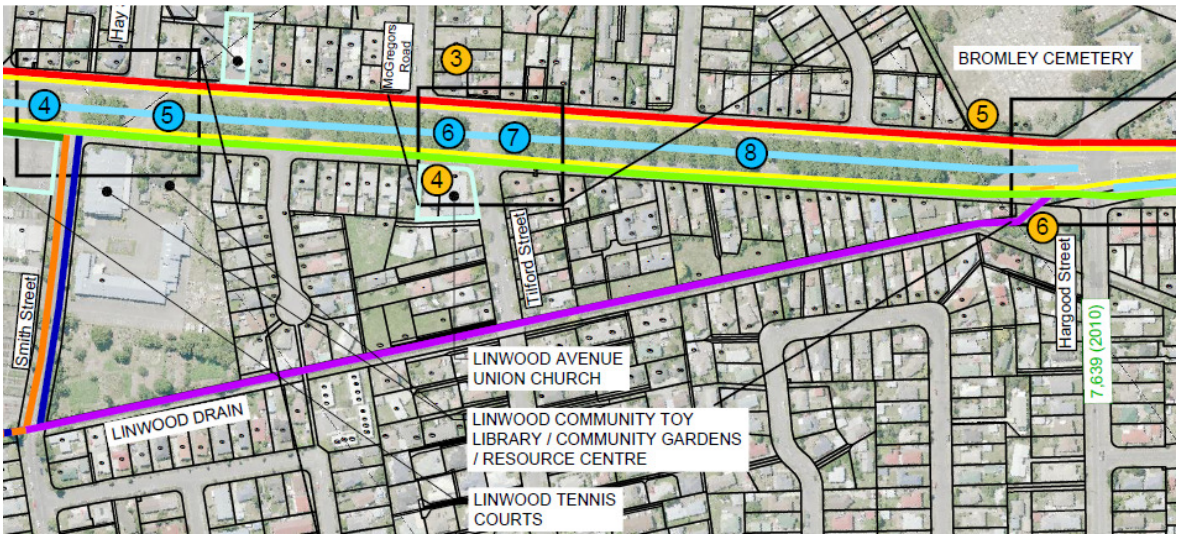

Figure 4-1: Section B Route Options

The preferred route is the light blue route and the alternative route is the light yellow route:

4.1 Preferred Route

4.1.1 Blue route

When considering all of the key criteria the safety, comfort and attractiveness of the light blue route are significantly better than the light yellow route and therefore would encourage greater volumes of interested but concerned cyclists. Avoiding on-street parking removal required for the light yellow route is expected to be favourable to the local community.

4.2 Alternative Route

4.2.1 Light yellow route

The alternative light yellow option of separated cycle lanes adjacent to the median was considered by the Safety and Network Functionality audit to be "unconventional and a cause of uncertainty". It is considered that the "uncertainty" of the median side cycleway could be reduced through careful design.

4.3 Discounted Routes

4.3.1 Red route

A significant safety risk with the red route would be that westbound cyclists on the bi-directional cycle facility would cross four side roads. Traffic from the side road would expect to only give way to the right as traffic is only travelling one way. This would create an increased risk of a cyclist/vehicle collision.

4.3.2 Light green route

A significant safety risk with the red route would be that east bound cyclists on the bi-directional cycle facility would cross three side roads. Traffic from the side road would expect to only give way to the right as traffic is only travelling one way. This would create an increased risk of a cyclist/vehicle collision.

4.3.3 Yellow route

The yellow route was considered to be less favourable than the light yellow route as locating separated cycle lanes adjacent to the footpath would have impacts on parking and would have increased safety concerns due to interaction with side roads, driveways and parked car doors.

4.3.4 Purple route

The purple route is an existing footpath alongside the Linwood Drain. It was assumed that to meet the minimum standards for a MCR the path would need widening over the drain which would have consenting issues and a significant capital costs. Figure 4-2 below illustrates the current width and environment of the footpath.

Figure 4-2: Linwood Drain Footpath

Even after widening, the Linwood Drain route would be an isolated and threatening area, which is enclosed and difficult to escape giving a low sense of personal security particularly after dark which would deter users. There are limited exit opportunities and natural surveillance has been removed over time as residences have created barriers for privacy and to increase their own security over their properties reducing visibility of the path. It was considered that it would become a daytime only route and even then would be unappealing to many potential users and therefore would not meet the project objectives.

5 Hargood Street to St Johns Street

In order to connect between Hargood Street and St Johns Street the following 4 options were considered:

- Red route - bi-directional separated cycle path on the north side of Linwood Avenue;
- Blue route - shared path in the residential service lane berm on the south side of Linwood Avenue;
- Green route - neighbourhood greenway along the residential service lane; and the
- Yellow route - one way separated cycle paths on both sides of Linwood Avenue adjacent to the footpath.

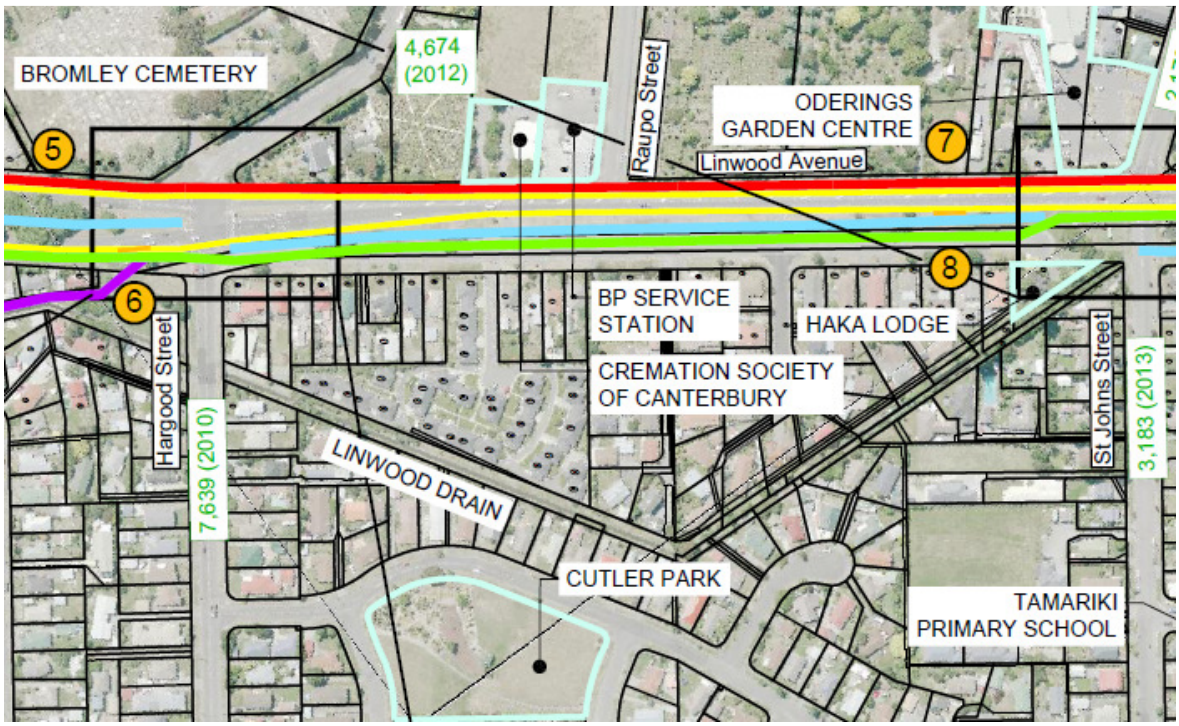

Figure 5-1: Section C Route Options

The preferred route is the blue route and the alternative route is the green route:

5.1 Preferred Route

5.1.1 Blue route

The coherence, comfort and attractiveness of the blue route make it significantly better than the green route.

5.2 Alternative Route

5.2.1 Green route

A new road surface would be required along the residential service lane, which is likely to be assessed favourably by the community; however the cost for the benefits to non MCR users is not considered to be justified.

5.3 Discounted Routes

5.3.1 Red route

The red route is less desirable as it crosses Raupo Street, the crematorium society entrance and the BP service station entrances with contraflow cyclists meaning there would be a risk of collisions between traffic and cyclists, which would be avoided by the green and blue routes. Some on street parking would need to be removed to accommodate the new facility.

5.3.2 Yellow route

The yellow route is less desirable as it would also cross Raupo Street, the crematorium society entrance and the BP service station entrances with cyclists travelling in the same direction as traffic. Some on street parking would need to be removed to accommodate the new facility.

6 Sub Section D Options – St Johns Street to Dyers Road

In order to connect between St Johns Street and Dyers Road the following 5 options were considered:

- Red route - bi-directional separated cycle path on the north side of Linwood Avenue;
- Green route - shared path on the south side of Linwood Avenue adjacent to the Linwood Canal in the wide grass berm;
- Yellow route - one way separated cycle paths on both sides of Linwood Avenue adjacent to the footpath;
- Blue route - shared path to the south of Linwood Canal (existing footpath);
- Brown route – Neighbourhood Greenway along St Lukes Street requiring purchase of a sliver of land from the Samoan Church along the southern boundary.

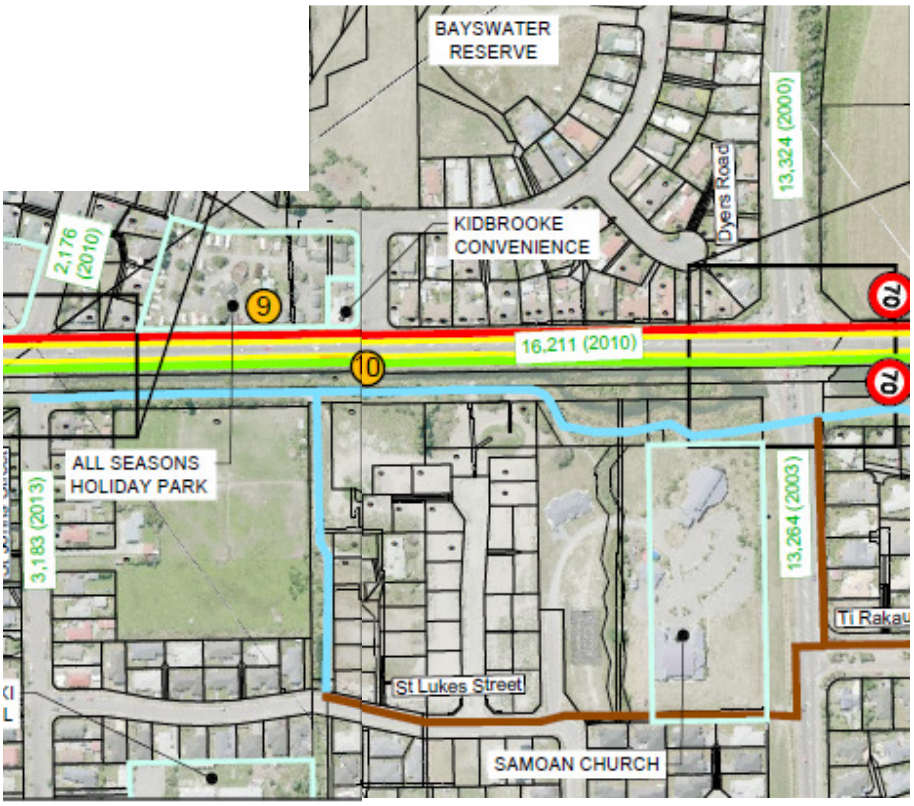

Figure 6-1: Section D Route Options

The preferred route is the green route and the alternative route is the blue route:

6.1 Preferred Route

6.1.1 Green route

The green route has been preferred due to a combination of the existing and potential amenity value benefits of travelling along the Linwood Canal and the significant issues associated with the other routes. The green route would be more coherent as it would be easily visible from Linwood Avenue as is the case for the preferred route in all other sections.

6.2 Alternative Route

6.2.1 Blue route

The blue route would potentially be more comfortable and attractive than the green route, but mainly due to the extra separation from Linwood Avenue traffic during the day time. Despite the proposed extensive vegetation removal to provide some passive surveillance from traffic on Linwood Avenue, the blue route would be unappealing particularly after dark due to the barrier of Linwood Canal and the lack of escape routes, and therefore is likely to attract fewer interested but concerned users than the green route. The Samoan Church patrons and residents of St Florian Place would benefit from the existing path upgrade.

6.3 Discounted Routes

Red route

There is limited width in the road reserve at the eastern end. In order to introduce a bi-directional cycle path with a separator alongside a footpath it would require at least 5.65m using desirable minimum widths, which would mean moving the traffic lanes and median over by approximately 3m. The west bound traffic lanes would need to be supported by a retaining wall, which would encroach into the Linwood Canal and would require significant strength to support heavy vehicle loads. This would give poor alignment for traffic through the intersection (which would create an increased accident risk) unless it was done on the Humphreys Drive approach as well. Removal of traffic lanes approaching the Dyers Road intersection is not considered to be feasible due to the impacts on the performance of the State Highway network.

The red route would cross Kidbrooke Street with contraflow cyclists meaning there would be a risk of collisions between traffic and cyclists which would be avoided by the green and blue routes.

Yellow route

Westbound cyclists would require a retaining wall in the Linwood Canal bank at the eastern end. For eastbound cyclists, without reducing traffic lanes or moving the carriageway (which would be very expensive) there is not sufficient width for a MCR standard cycle path with separator alongside a footpath. Removal of lanes approaching the Dyers Road intersection is not considered to be feasible due the impacts on the performance of the State Highway network. The route would cross Kidbrooke Street with cyclist travelling in the same direction as traffic, which would be avoided by the green and blue routes.

Brown route

The brown route requires property purchase from the Samoan Church which may be difficult to secure. It would be a convoluted route through quiet residential streets, which would be less recognisable and understandable for cyclists.

7 Sub Section E Options – Dyers Road to Charlesworth Reserve

In order to connect between Dyers Road and Charlesworth Reserve the following 5 options were considered:

- Red route - bi-directional separated cycle path on the north side of Linwood Avenue;
- Green route - shared path on the south side of Linwood Avenue adjacent to the Linwood Canal in the wide grass berm;
- Yellow route - one way separated cycle paths on both sides of Linwood Avenue;
- Blue route - shared path to the south of Linwood Canal (existing footpath); and the
- Brown route - Neighbourhood Greenway on Ti Rakau Drive.

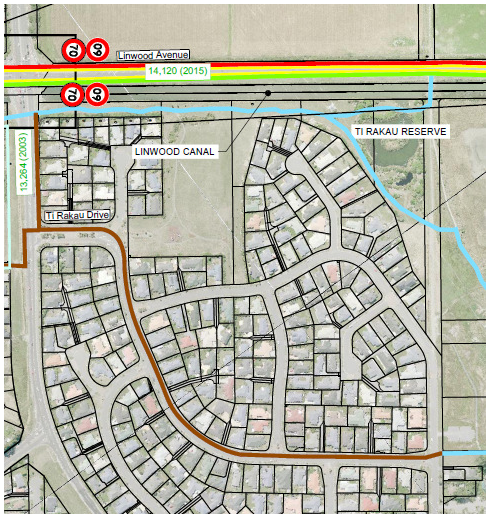

Figure 7-1: Section E Route Options

The preferred route is the green route and the alternative route is the blue route:

7.1 Preferred Route

7.1.1 Green route

The green route has been preferred due to a combination of the existing and potential amenity value benefits of travelling along the Linwood Canal and the significant issues associated with the other routes. The green route would be more coherent as it would be easily visible from Linwood Avenue as is the case for the preferred route in all other sections.

7.2 Alternative Route

7.2.1 Blue route

The blue route would be more comfortable and attractive due to the extra distance from Linwood Avenue traffic during the day time. The blue route provides an easier connection to residents from the south who are cycling; however there is an existing footpath. Despite vegetation removal at Ti Rakau Reserve to provide some passive surveillance from traffic on Linwood Avenue, the blue route would be unappealing particularly after dark due to the barrier of Linwood Canal and the lack of escape routes and therefore is likely to attract less interested but concerned users than the green route.

7.3 Discounted Routes

7.3.1 Yellow route

Westbound cyclists would require a retaining wall in the Linwood Canal bank at the western end. For eastbound cyclists a new signalised crossing of Dyers Road would be required. To provide MCR standard crossing facilities the left turn slip lane from Linwood Avenue (west) and Dyers Road (south) would need to be altered to typical left turn lanes using the traffic signal control. The combination of these changes would have a significant impact on the performance of the intersection and the State Highway network.

7.3.2 Brown route

The brown route would be a convoluted route through quiet residential streets, which would be less recognisable and understandable for cyclists. It could only be justified if it was a connection through to Charlesworth Reserve in Section F.

7.3.3 Red route

The red route has not been taken forward for the same reasons as in Section D that mean a direct connection cannot be achieved across Dyers Road.

8 Sub Section F Options – Charlesworth Reserve to Ferrymead Bridge

In order to connect between Charlesworth Reserve and Tidal View the following 4 options were considered:

- Red route - shared path on the north side of Humphreys Drive adjacent to the estuary edge;
- Green route - shared path on the south side of Humphreys Drive adjacent to Charlesworth Reserve;
- Yellow route - separated one way cycle paths on both sides of Humphreys Drive; and the
- Blue route - shared path through Charlesworth Reserve

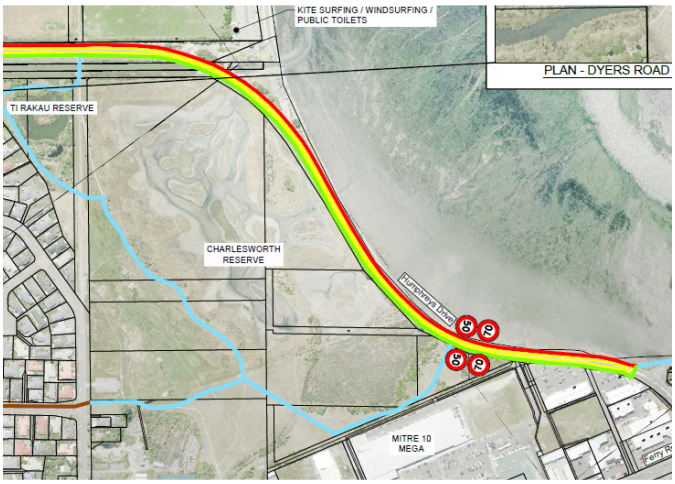

Figure 8-1: Section F Route Options

The preferred route is the red route and the alternative route is the blue route:

8.1 Preferred Route

8.1.1 Red route

The red route does not have the personal safety issues of the blue route, which means it can be used after dark. It is more attractive with views of the estuary as the continuation of the coastal pathway for an additional 600m, which is proposed to be extended by CCC to New Brighton as a separate project if not an MCR. The red route is clearly a better outcome for the MCR and the wider council objectives; however the seawall rebuild makes the red route significantly more expensive. The seawall would need to be rebuilt in the near future to protect the road and it would be more cost efficient to repair it for use by the MCR.

8.2 Alternative Route

8.2.1 Blue route

The CPTED advisor's opinion is that this route has fatal flaws because it cannot be made sufficiently safe due to its length, lack of exit choices, isolation, nature of terrain, and lack of surveillance. It would not be attractive to users at all the times it is required. It would be a daytime only route, which requires a viable concurrent alternative section/bypass for after dark use. The location of the proposed shared path is shown in Figure 8-2 below:

Figure 8-2: Charlesworth Reserve Photo

The blue route has the benefits of more protection from coastal winds and a signalised intersection provided for the Ferrymead retail area.

8.3 Discounted Routes

8.3.1 Yellow route

All of the options along Humphreys Drive require rebuild of the seawall; however the yellow route would require the most width which would significantly increase the cost of the seawall rebuild and the encroachment into the estuary.

8.3.2 Green route

The green route would require the same width as the red route; however it would be on the opposite side of the road to the estuary. Therefore if it was to form a continuation of the costal pathway it would require two controlled crossing points for users continuing between New Brighton and Sumner, which would have an unnecessary impact on traffic flow.

9 Tidal View

At the eastern extent of the route it was assumed that Tidal View would be used to connect Humphreys Drive with Ferrymead Bridge. Tidal View is shown in Figure 9-1 below.

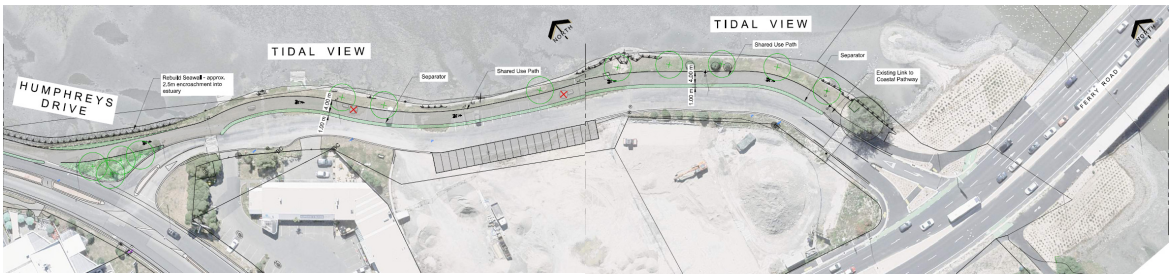

Figure 9-1: Tidal View

This route would minimise interaction with traffic and avoid the major Ferry Road and Humphreys Drive signalised intersection (to the south), which would have significant safety and low amenity issues.