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Memo

To: Christchurch City Council (CCC)
From: Team Velos
cc:
Date: October 20, 2016
Re: Heathcote Expressway – Route Selection Summary

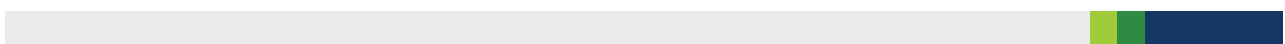
1 Introduction

Summary of the combined rationale from combined Multi Criteria Analysis (MCA), Technical Advisory Group (TAG), initial Safety Audit & Network Functionality (SANF) process, and further investigations.

Brief of Heathcote Expressway Route was to connect the Ara institute in the CBD to Martindales Road in the Heathcote Valley.

For the MCA process, the study length was originally divided into six sub-sections (A to F) with four main route options per section (see Figure 1-1 below).

The results of the MCA process were discussed with CCC's TAG and independent SANF reviewers who provided additional comments and considerations.



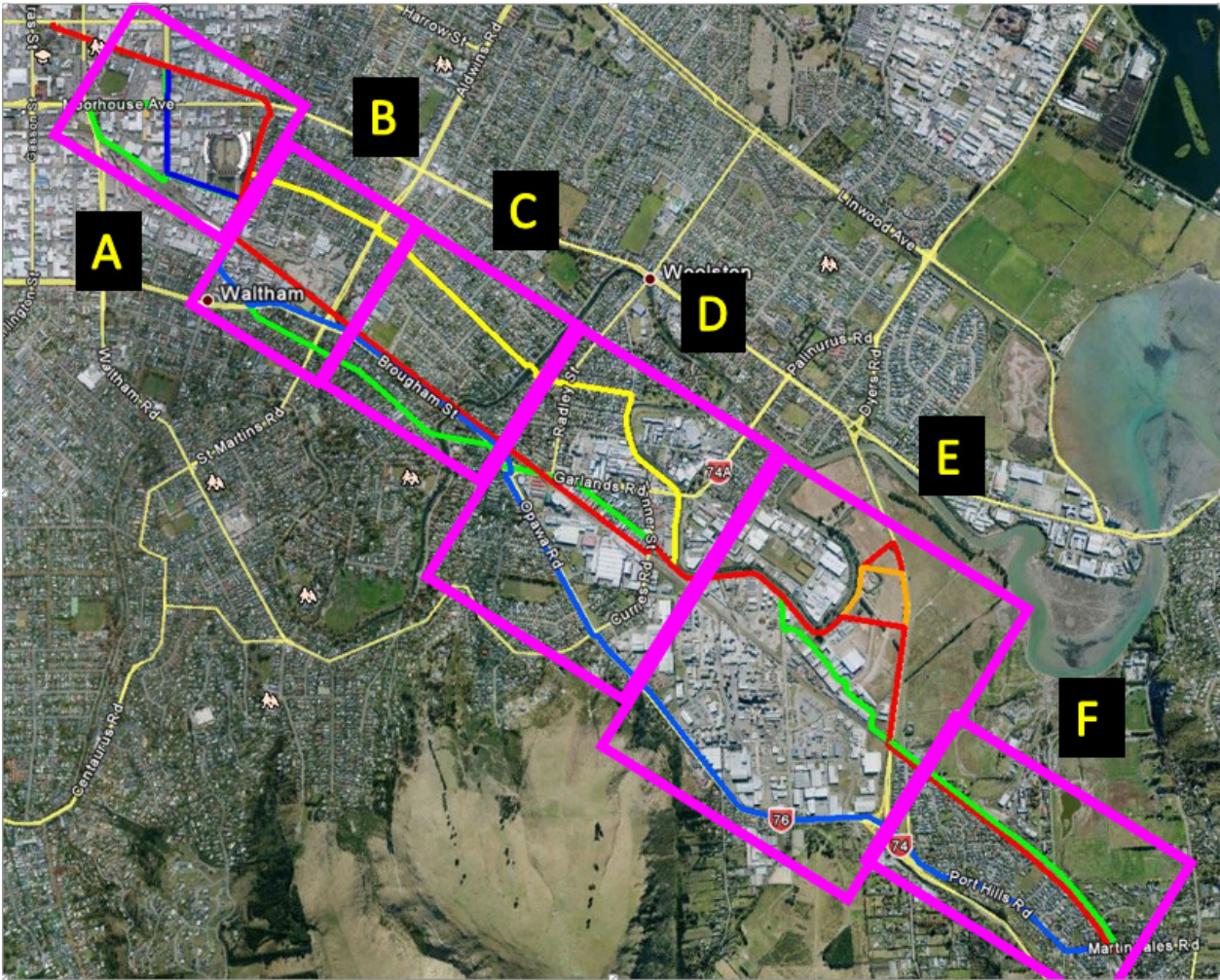


Figure 1-1: Route Sub -sections

2 Section A – Ara to Wilsons

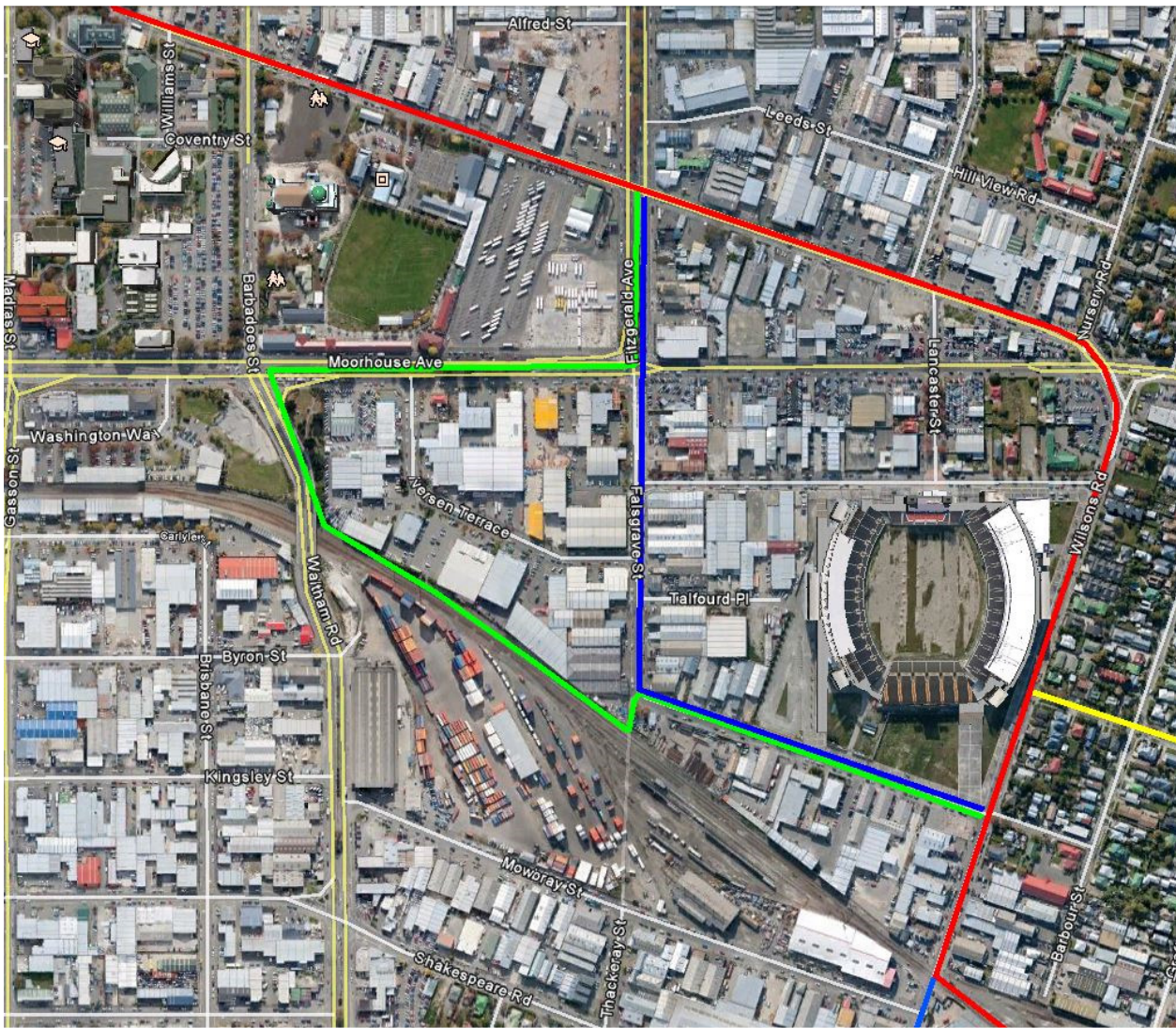


Figure 2-1: Section A

2.1 Preferred Route

2.1.1 RED Route

RED was the preferred route for the following key reasons:-

- Safety – “Straight thru” manoeuvres at signals;
- Directness & Coherence – few complicated turns; and
- Crime Prevention Through Environmental Design (CPTED) – residential surveillance on Wilsons Road.

2.2 Alternate Routes

2.2.1 BLUE Route

Compared to RED, BLUE was not the preferred route for the following key reasons:-

- Falsgrave St – Poor CPTED;
- Moorhouse/Fitzgerald intersection, delays as these signals are set up for heavy traffic volumes as per Christchurch Transport Strategic Plan and An Accessible City (AAC) goals; and
- Coherence – 3 x right-turn manoeuvres.



Figure 2-2: Falsgrave Street

2.2.2 GREEN ROUTE

Compared to RED, GREEN was not the preferred route for the following key reasons:-

- Directness – longer route;
- Coherence – complicated, convoluted route; and
- CPTED – Poor CPTED outcomes along Rail corridor section.

3 Section B – Wilsons to Ensors

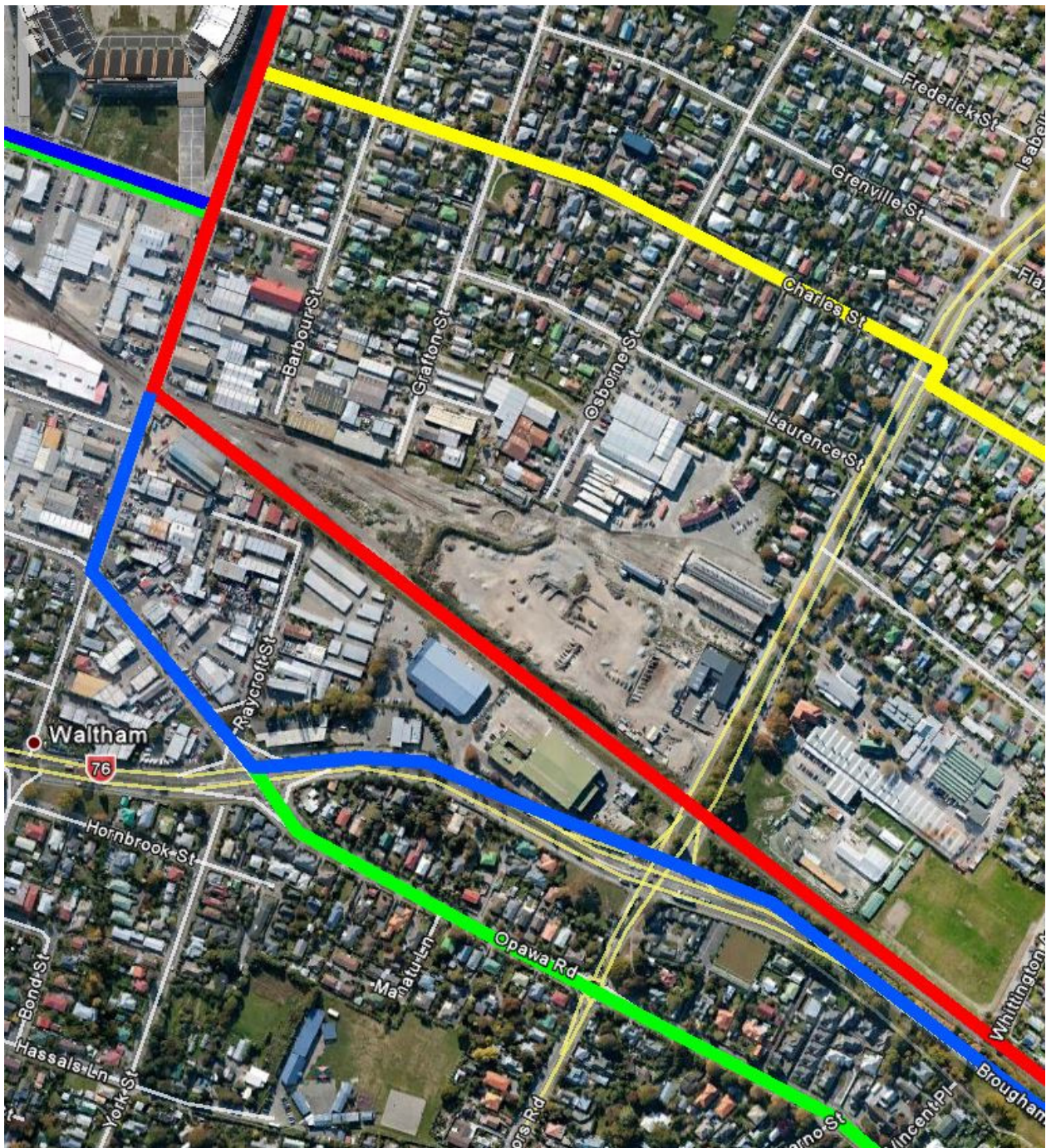


Figure 3-1:- Section B

3.1 Preferred Route

3.1.1 YELLOW Route

YELLOW was the preferred route for the following key reasons:-

- Safety – low traffic numbers, 40km/h zone, existing traffic calming in place;
- CPTED & Attractiveness – residential outlook; and
- Directness & Coherence – easy to follow route with few complicated manoeuvres.

3.2 Alternate Routes

3.2.1 BLUE Route

Compared to YELLOW, BLUE was not the preferred route for the following key reasons:-

- Safety – higher traffic volumes, industrial driveways on Wilsons/Opawa section;
- Coherence – 2 x right turn manoeuvres;
- Business impact – loss of parking in industrial area;
- Attractiveness – industrial section of Wilsons/Opawa; and
- Costs – 1 x new full signals (Wilsons/Opawa), 2 x adjustments to existing (Opawa/Brougham & Brougham/Ensors) compared to Yellow (2 ped signals @ Wilsons, Ensors).

3.2.2 GREEN Route

Compared to YELLOW, GREEN was not the preferred route for the following key reasons:-

- Safety – higher traffic volumes, industrial driveways on Wilsons/Opawa section;
- Business impact – loss of parking in industrial area;
- Residential impact – loss of parking along Opawa Road;
- Attractiveness – industrial section of Wilsons/Opawa; and
- Costs – 2 x new full signals (Wilsons/Opawa & Opawa/Ensors), 1 x adjustments to existing (Opawa/Brougham & Brougham/Ensors) compared to Yellow (2 ped signals @ Wilsons, Ensors).

3.2.3 RED Route

Compared to YELLOW, RED was not the preferred route for the following key reasons:-

- CPTED – 600m length of no access points (compare 200m average on existing northwestern facility), no natural surveillance;
- Cost risk – KiwiRail require annual leases for using their corridor;
- Attractiveness – industrial outlook; and
- Operational impacts – increased maintenance costs, due to limited vehicle access to off-road path.



Figure 3-2: Rail Corridor, West of Ensors

4 Section C – Ensors to River



Figure 4-1: Section C

4.1 Preferred Route

4.1.1 YELLOW Route

YELLOW was the preferred route for the following key reasons:-

- Safety – low traffic numbers, some existing traffic calming measures already in place;
- CPTED & Attractiveness – residential outlook; and
- Directness & Coherence – easy to follow route with few complicated manoeuvres.

4.2 Alternate Routes

4.2.1 BLUE Route

Compared to YELLOW, BLUE was not the preferred route for the following key reasons:-

- Consenting risk with new bridge, yellow route would be widening or replacing an existing bridge which has shorter timeframes;
- Cost Risk – Nth side of SH would be building over drainage swale which would then have to be piped; and
- Coherence – Poor match to residential demand.

4.2.2 GREEN Route

Compared to YELLOW, GREEN was not the preferred route for the following key reasons:-

- Safety – higher traffic volumes, busier intersecting side streets;
- Residential impact – loss of parking along Opawa Road; and
- Business impact – loss of parking along Opawa Road.

4.2.3 RED Route

Compared to YELLOW, RED was not the preferred route for the following key reasons:-

- CPTED – no natural surveillance;
- Consenting risk with new bridge, yellow route would be widening or replacing an existing bridge which has shorter timeframes;
- Cost risk – KiwiRail require annual leases for using their corridor;
- Land use – KiwiRail have leased out sections of their corridor to residents, leases would need to be bought out;
- Attractiveness – industrial outlook; and
- Operational impacts – increased maintenance costs, due to limited vehicle access to off-road path.

5 Section D – River to Curries

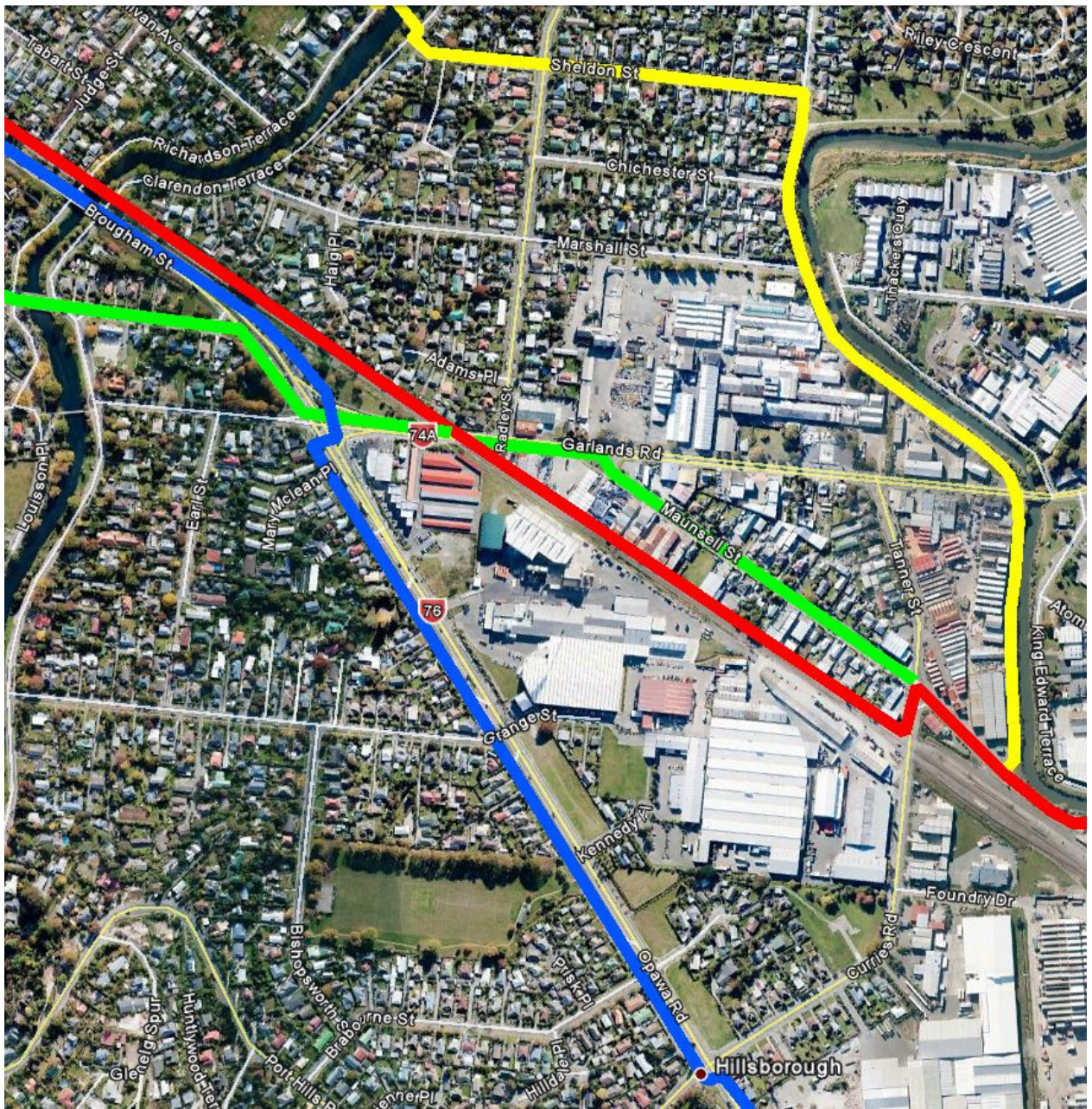


Figure 5-1: Section D

5.1 Preferred Routes

5.1.1 YELLOW Route

YELLOW was a preferred route for the following key reasons:-

- Safety – low traffic numbers, avoids Curries/Tanner/Maunsell problem intersection;
- CPTED & Attractiveness – residential and river outlook; and
- Coherence – Connects to Tannery.

5.1.2 BLUE Route

BLUE was a preferred route for the following key reasons;

- Safety - avoids Curries/Tanner/Maunsell problem intersection;
- CPTED & Attractiveness – residential outlook; and
- Coherence – connects to Hillsborough community.

5.2 Alternate Routes

5.2.1 GREEN Route

Compared to YELLOW & BLUE, GREEN was not the preferred route for the following key reasons:-

- Safety – section along Garlands would be in close proximity with large traffic volumes;
- Attractiveness – industrial section of Maunsell street; and
- Costs – Modify SH76/SH74A signals, + new signals at Curries/Tanner.

5.2.2 RED Route

Compared to YELLOW & BLUE, RED was not the preferred route for the following key reasons:-

- CPTED – no natural surveillance, 650m length of no access points;
- Cost risk – KiwiRail require annual leases for using their corridor;
- Land use – Minimal width available on North side due to 4 tracks and drainage, South side unavailable;
- Attractiveness – industrial outlook; and
- Operational impacts – increased maintenance costs, due to limited vehicle access to off-road path.

6 Section E – Curries to Tunnel



Figure 6-1: Section E

6.1 Preferred Routes

6.1.1 RED Route

RED was a preferred route for the following key reasons:-

- Safety – majority of this section is away from traffic;
- Coherence – links to Tannery;
- Comfort – few stop/starts; and
- Attractiveness – Esplanade reserve & Kennaway Park reserve areas attractive.

6.1.2 BLUE Route

BLUE was a preferred route for the following key reasons:-

- Safety – reduced traffic interaction due to off-road path; and
- Directness & Coherence – easy to follow, few complicated manoeuvres.

6.2 Alternate Route

6.2.1 GREEN Route

Compared to RED & BLUE, GREEN was not the preferred route for the following key reasons:-

- Safety & Attractiveness – additional mixing with industrial traffic on Chapmans, Kennaway & Dalziel;
- Coherence – convoluted route down Chapmans, Kennaway & Dalziel;
- Business impact – parking loss in industrial area; and
- Land use & Consultation – land purchase required at end of Dalziel place.

7 Section F – Tunnel to Martindales

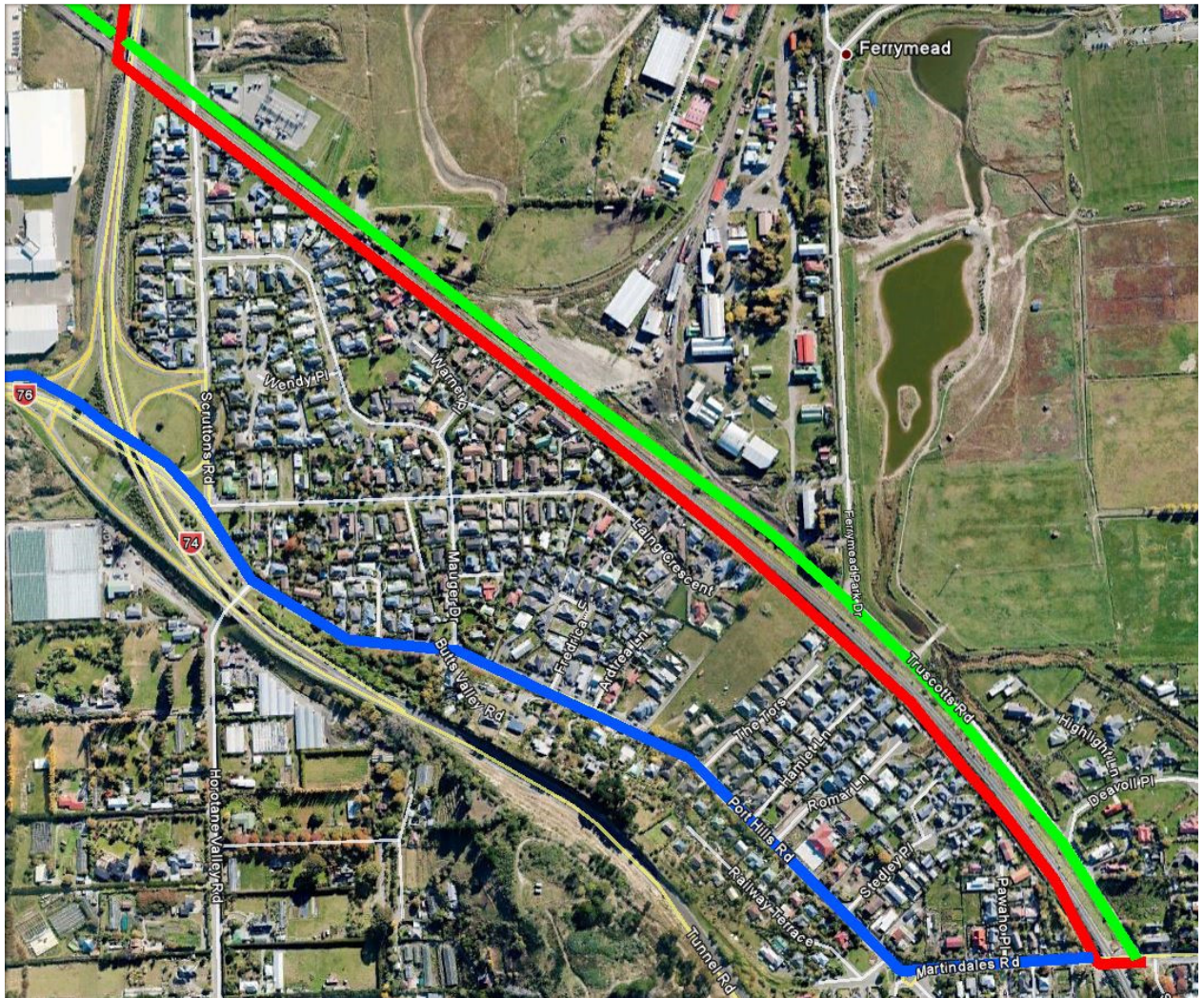


Figure 7-1: Section F

7.1 Preferred Routes

7.1.1 GREEN Route

GREEN was a preferred route for the following key reasons:-

- Attractiveness & CPTED – Pleasant, open rural outlook, small number of residential properties on Truscotts Road. Potential future connections (Subway, use of Scruttons Rd/Mauger Dr) to Heathcote community;
- Safety – Combination of off-road path and low volume Truscotts Road; and
- Coherence – links to Ferrymead Park.

7.1.2 BLUE Route

BLUE was a preferred route for the following key reasons:-

- Attractiveness & CPTED – residential outlook surveillance; and
- Coherence – Connects residential area.

7.2 Alternate Route

7.2.1 RED Route

Compared to GREEN & BLUE, RED was not the preferred route for the following key reason:-

- CPTED & Attractiveness – path would be squeezed between high rail embankment and box drain, many high trees at rear of residential properties reduce passive surveillance.

8 Further Investigations

At the end of the MCA, TAG & SANF process, two overall preferred routes (see Figure 8-1 below) as well as several sub-route and connection options were investigated further. The two main route options were known as the Northern (PURPLE) route and the Southern (BLUE) route.

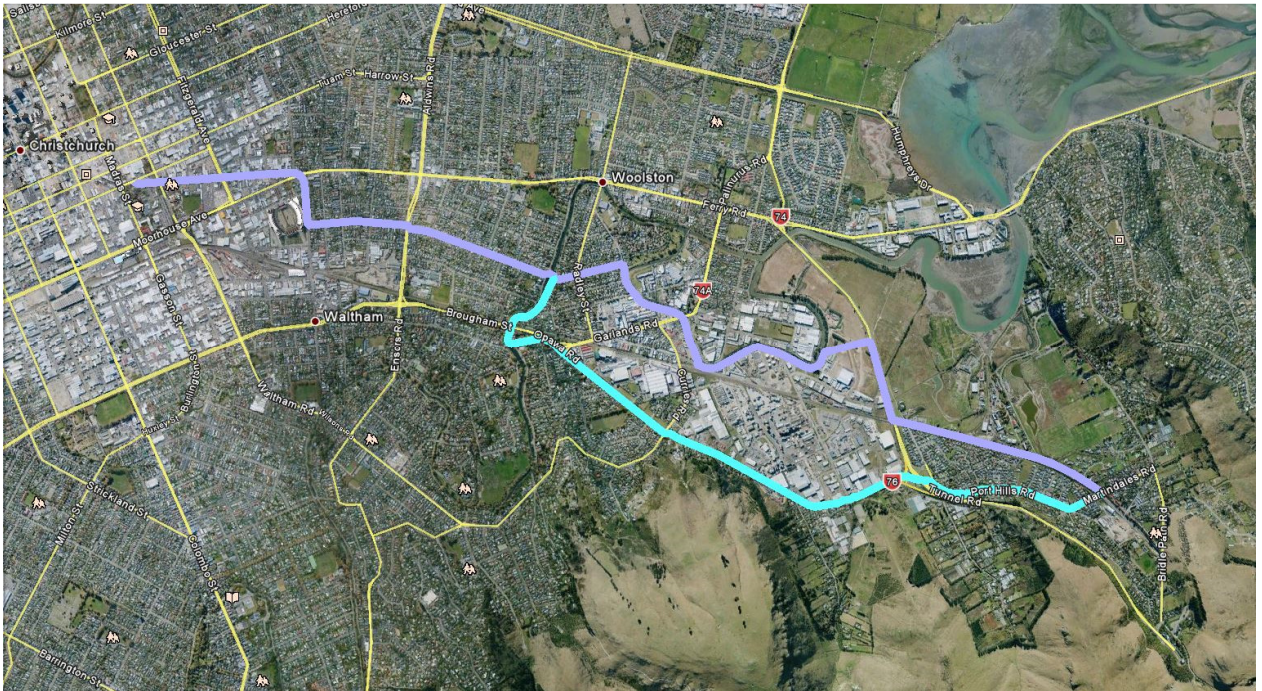


Figure 8-1: Northern & Southern Routes

8.1 Southern Route

8.1.1 Route Description

From Ara to the Heathcote River, the Southern route and Northern route were identical, namely Ferry Road, Wilsons Road, Charles Street and Mackenzie Ave.

At the Heathcote River, the Southern route followed the river along Richardson Terrace, used the existing wide footpath on the Opawa Road Bridge, then followed SH76, navigating through the Tunnel Road interchange and following Port Hills Road & Martindales Road.

8.1.2 North Side Issues

The Southern route followed SH76, which is NZTA's biggest truck freight route in the South Island. The proposed treatment initially included 1.8km of an off-road, 2-way cycle path on the northern side of the state highway between Curries Road and Tunnel Road (see Figure 8-2 below). It was anticipated that using the northern side would require additional traffic signals to be installed at both the Curries Road and Chapmans Road intersections.



Figure 8-2: Southern Route, Curries Rd to Tunnel Rd

Discussions with NZTA concluded that there were significant safety concerns with using the wide berm on the north side of the highway, due to the presence of several entrances and intersections which are used by heavy vehicles turning on and off the highway.

8.1.3 South Side Issues

In order to avoid the safety concerns of using the northern side, further investigations work was done to see if a shared path on the southern side of the highway could work. To achieve a shared path of acceptable width required shifting the entire highway northwards over a distance of about 1km. This would likely involve very significant construction and traffic management costs.

8.1.4 Tunnel Road Interchange Issues

Irrespective of which side of SH76 was used for a shared path, the Southern route required to navigate through the Tunnel Road interchange (see Figure 8-3 below). This would have required multiple crossing points and installation of at least 1 set of signals to allow cyclists to safely cross slip lanes or on/off ramps. Additionally, significant lengths of retaining wall would be required at either bridge abutment in order to fit a shared path of acceptable width.

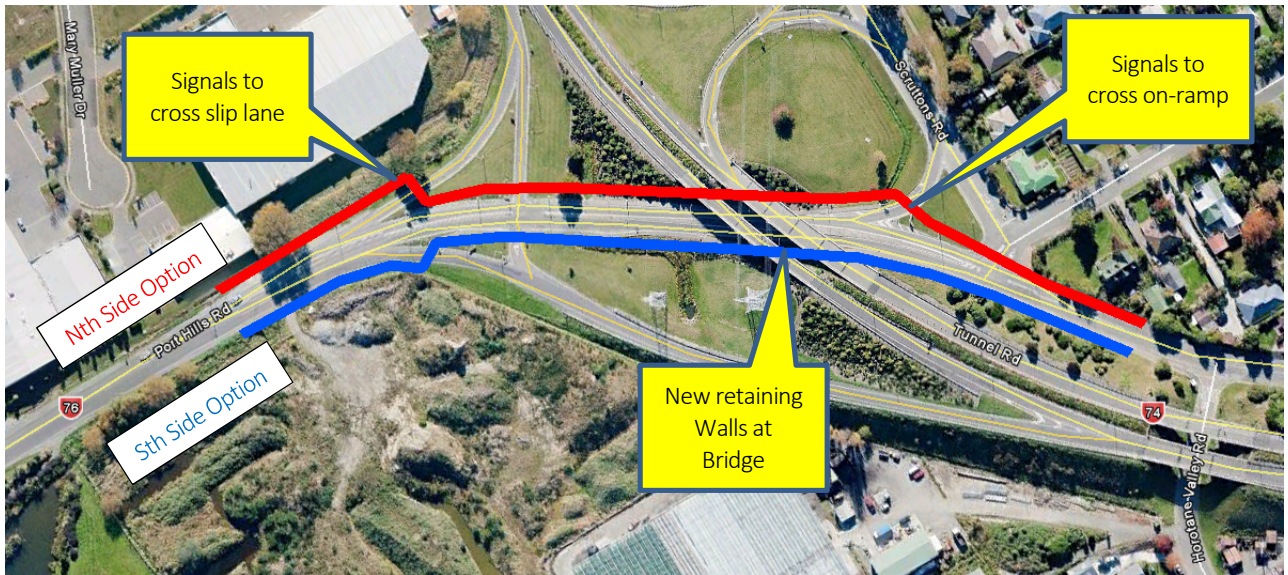


Figure 8-3: Tunnel Road Interchange

8.1.5 Port Hills Road Issues

The residential part of Port Hills Road between Tunnel Road and Martindales Road has a very narrow road corridor, with typically only 15m boundary to boundary available instead of the more usual 20m (see Figure 8-4 below).

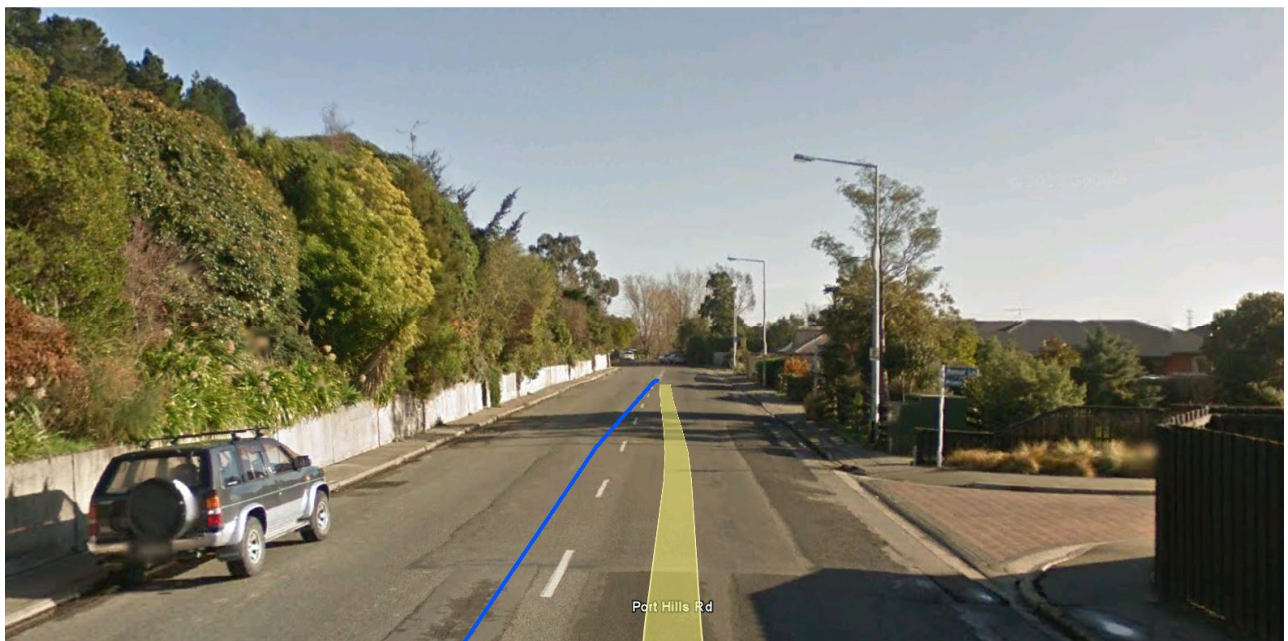


Figure 8-4: Port Hills Road

The traffic volumes on Port Hills road are too high for a shared space/neighbourhood greenway option to be considered. Therefore some form of seperated paths would be required, this would remove parking on at least one side of the road. Port Hills Road is also a Bus Route with eight bus stop locations along it's length (see Figure 8-5 below) which would compound the narrow width issues.

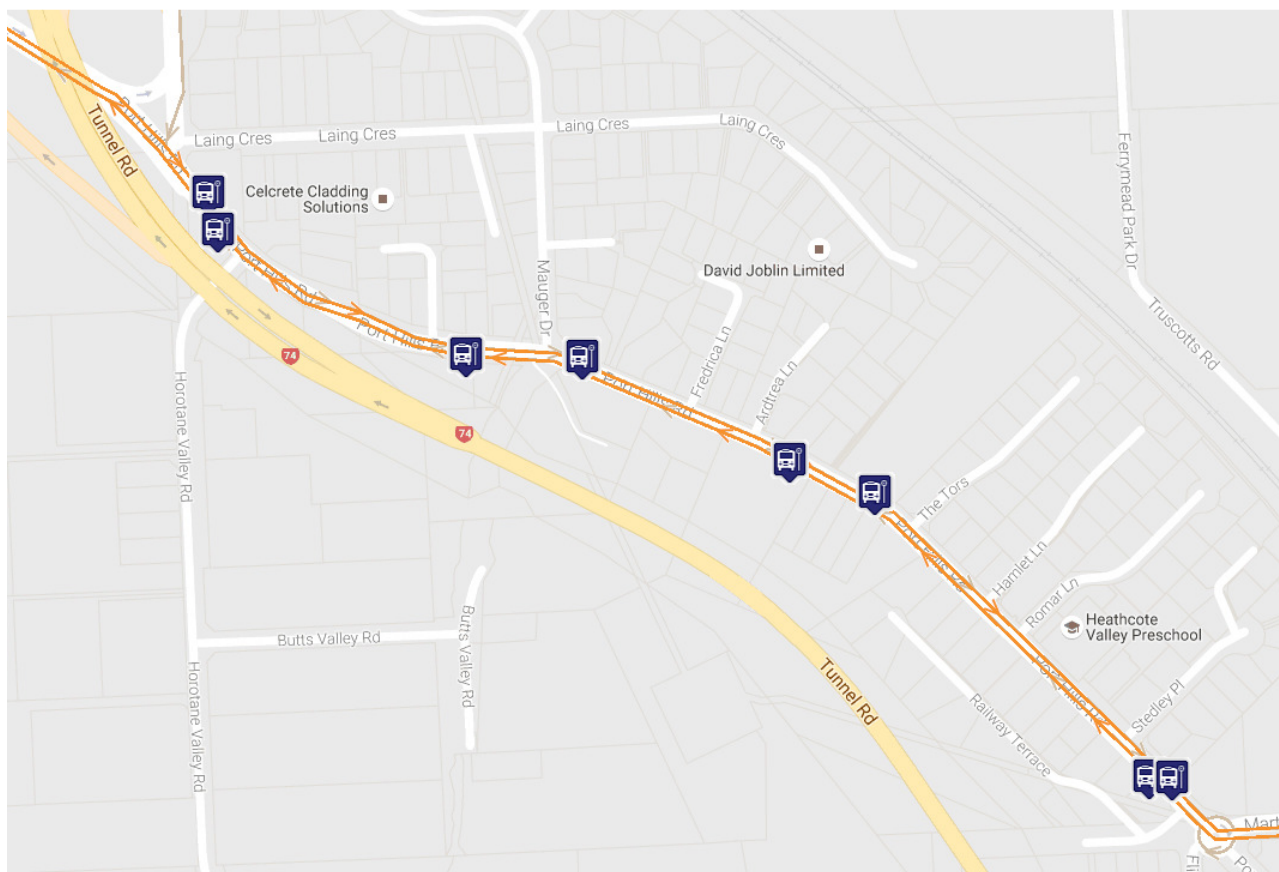


Figure 8-5: Port Hills Road Bus Stops

On the south side of Port Hills Road there are several residential properties with steep driveways, it was observed that drivers tended to reverse out of these, this would be an additional safety concern if a shared path were to be constructed on the southern side.

The intersection of Port Hills Road and Martindales Road is currently a roundabout. Roundabouts are undesirable on Major Cycle Routes as they tend to have poor safety outcomes for cyclists. To solve these safety concerns usually requires converting the intersection to traffic signals or providing separate cycle facilities which requires extra land. Either of these solutions has cost implications.

8.1.6 Conclusion

The issues outlined in Sections 8.1.2 to 8.1.5 are summarised in Table 8-1 below:-

Table 8-1: Southern Route Issues Summary

Section	North side Shared Path	South Side Shared Path
SH76 Curries Road to Tunnel Road	Cost: 2 x Signals Intersections; Safety: HCVs turning in/out	Cost: Shift entire highway over
Tunnel Road Interchange	Cost: 2 x signal crossings and retaining wall at Bridge abutment; Safety: Crossing where HCVs are speeding up	Cost: 1 x signal crossings and retaining wall at Bridge abutment; Safety: Crossing where HCVs are coming from high speed area
Port Hills Road	Cost: 4 x bus stop treatments and Martindales intersection upgrade	Cost: 4 x bus stop treatments and Martindales intersection upgrade; Safety: sight visibility at steep driveways

Therefore due to the various cost and safety concerns of the Southern route, the Northern (Purple) route was preferred. No further design work was done on the Southern route.

8.2 King Edward Terrace

A sub-route along King Edward Terrace was investigated in order to avoid the industrial stretch of Cumnor Terrace (see Figure 8-6 below)

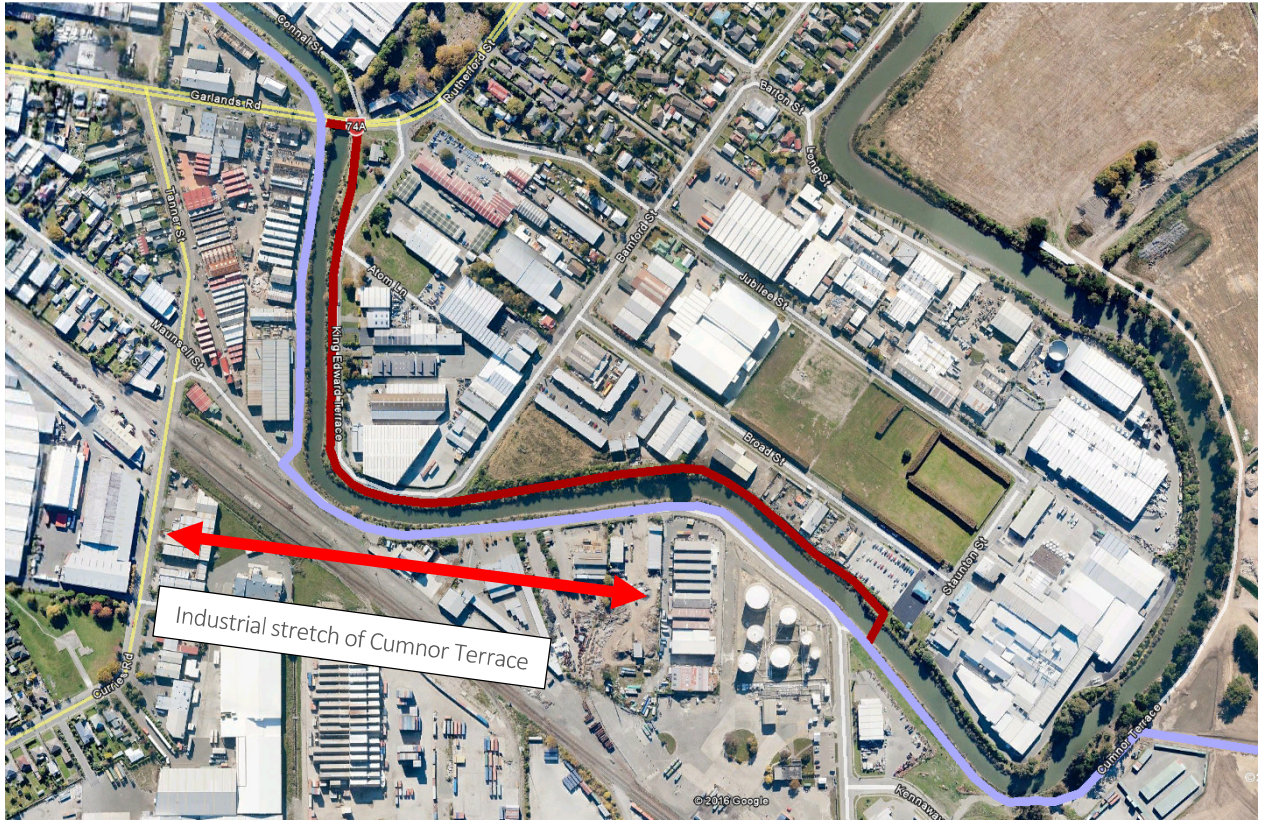


Figure 8-6: King Edward Terrace Route

This option was not preferred compared to the purple route for the following key reasons:-

- Very poor CPTED once path leaves roadway;
- Cost of additional bridge over Heathcote River.

8.3 Sheldon Street Treatments

Currently Sheldon Street is a 480m length of low traffic volume, residential street with poor surface condition and older style deep kerbs for drainage. Currently Sheldon street is programmed to have street renewal treatment addressing these issues sometime between 2022 and 2026. The Heathcote Expressway MCR is due to being construction in 2017, which is earlier than the street renewal, therefore two treatment options considered for this street are discussed below.

8.3.1 Option 1 – Full Neighbourhood Greenway

This option would effectively bring forward the planned future street renewal and combine it with best practice greenway design principles including narrowing of carriageway and additional greenspace to provide a streetscape which achieves the desirable speed environment and aesthetic quality required for the MCR route. This includes new kerb and channel and installing new stormwater infrastructure. This option will be the most expensive option, but it achieves the best outcomes and avoids any 'fiscal wastage' that would be caused by having future rework.

8.3.2 Option 2 – Leave Existing Deep Kerbs (Do-Minimum)

This option would involve installing traffic calming measures at intervals along the existing street to achieve a slower speed environment suitable for use as a shared space with cyclists. This is similar to the philosophy proposed on MacKenzie Ave, the key difference being that MacKenzie Ave already has modern, high standard kerb and channel.

This option would be the cheapest, but the existing poor condition of the surfacing and deep kerbs would remain until the street renewal works is completed sometime within the next 10 years .

8.3.3 Conclusion & Recommendation

It is considered that the Full Neighbourhood Greenway (Option 1) provides the greatest overall benefits by providing a safe, attractive, streetscape for all road users.

9 Final Preferred Route

The final preferred route which has been taken through to scheme plans is shown in Figure 9-1 below.



Figure 9-1: Final Preferred Route