Waimakariri District Council

Utilities and Roading Committee

Agenda

Tuesday 18 April 2023
9am

Council Chambers
215 High Street
Rangiora

Members:

Cr Niki Mealings (Chairperson)
Cr Robbie Brine
Cr Philip Redmond
Cr Joan Ward
Cr Paul Williams
Mayor Dan Gordon (ex officio)

WAIMAKARIRI
DISTRICT COUNCIL

AGENDA CONTENTS – UTILITIES AND ROADING COMMITTEE MEETING

The Chairperson and Members
UTILITIES AND ROADING COMMITTEE

A MEETING OF THE UTILITIES AND ROADING COMMITTEE WILL BE HELD IN THE COUNCIL CHAMBER, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA ON TUESDAY 18 APRIL 2023 AT 9AM.

Sarah Nichols
GOVERNANCE MANAGER

Recommendations in reports are not to be construed as Council policy until adopted by the Council

BUSINESS

Page No

1 APOLOGIES

2 CONFLICTS OF INTEREST

Conflicts of interest (if any) to be reported for minuting.

3 CONFIRMATION OF MINUTES

3.1 Minutes of the meeting of the Utilities and Roading Committee held on Tuesday 21 March 2023.

9-27

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Confirms** the circulated Minutes of the meeting of the Utilities and Roading Committee held on 21 March 2023, as a true and accurate record.

3.2 Matters arising (From Minutes)

3.3 Notes of the workshop of the Utilities and Roading Committee held on Tuesday 21 March 2023

28-30

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** the circulated notes of the workshop of the Utilities and Roading Committee, held on 21 March 2023.

4 DEPUTATION/PRESENTATIONS

4.1 Rangiora Cycleway

PAK'nSAVE representatives Rebecca Parish and James Flanagan will be present to speak on the proposed Railway Road alignment.

5 REPORTS

5.1 Transport Choices Project 2 – Feasibility of alternative alignments – Kieran Straw – Civil Project Team Leader) and Don Young (Senior Engineering Advisor)

31-87

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** Report No. 230322039767.

(b) **Approves** the Scheme Design as per Attachment ii (Railway Rd/Torlesse St/Coronation St/Ellis Rd) and Option Four (section 4.5) of this report for the purposes of consultation.

(c) **Notes** that alternative options to Railway Rd past PAK'nSave have been considered as per Attachment iii), and are commented on in more detail below:

i. Southbrook Road (up to Coronation Street)

ii. Southbrook Road (up to Todds Rd, and using Ellis Road)

iii. Southbrook Road (up to Mitre 10 and along South Brook)

iv. Railway Rd (as originally proposed)

v. Railway Road (utilising the eastern side of the rail corridor)

vi. Eastern Link alignment (between Marsh Rd to Boys Rd)

vii. Eastern Link alignment (between Lineside Rd and Marsh Rd)

(d) **Notes** that a Technical Note from Road Safety Specialists (Attachment iv) has identified that it should be possible to establish a transport environment that would provide an acceptable level of safety and amenity for the various user groups in this area, provided a number of identified matters in the Note are addressed.

(e) **Notes** that any option that includes a level crossing, or alignment within the KiwiRail Corridor will need to follow KiwiRail processes, which at the moment they have indicated this could take "years to complete." (Attachment v). This is due to staff shortages and a high workload within KiwiRail.

(f) **Notes** that the landowner under the majority of the Rangiora Eastern Link land has advised that they do not support that option (Attachment vi).

(g) **Requests** that staff work collaboratively with PAK'nSave, Foodstuffs South Island and their representatives to address their concerns and endeavour to reach a mutual agreement on safety mitigation measures.

(h) **Notes** that staff will discuss the approved Scheme Design with all other directly impacted residents, businesses and stakeholders (including KiwiRail and Waka Kotahi) to ensure that issues and concerns are carefully considered and taken into account.

(i) **Notes** that feedback from the consultation will be fed into the Detailed Design, and that the Detailed Design will be reported back to the Committee in July 2023.

(j) **Notes** that a full Road Safety Audit will be carried out and the recommendations of that (including any intersection re-configuration) will be discussed fully with PAK'nSave and other impacted stakeholders, and then be incorporated into the Detailed Design for consideration by the Committee.

(k) **Notes** the scheme design requires the removal of 7 on street car parking spaces, and that the final approval of any parking spaces to be removed will be included within the detailed design report in July 2023.

(l) **Notes** that any parking to be removed as result of the Scheme Design will be consulted directly with the immediate adjacent residents.

(m) **Notes** that the scheme design requires the removal of 12 existing street trees, which are required to be replaced in alternative locations to be agreed with Greenspace, and that final approval of the removal of any street trees will be included within the detailed design report in July 2023.

(n) **Notes** that this project is funded through the "Transport Choices" funding stream (which is still subject to final signing and confirmation), and this requires that all works is complete by June 2024.

5.2 East Belt Rain Gardens – Claudia Button (Project Engineer) and Jason Recker (Stormwater and Drainage Manager)

88-126

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 230404047292.

(b) **Approves** the finalised concept design to be progressed to detailed design and construction in the 2023/24 financial year.

(c) **Notes** that the high level cost estimate is 3% over the available budget, however through the detailed design process the design and engineer's estimate will be refined to ensure the project is within budget.

(d) **Notes** that the cost estimate will be further refined during detailed design with recent tendered rates and a reflection of the extent of the design that can be included within these rates.

(e) **Circulates** the report to the Rangiora-Ashley Community Board for information.

5.3 87 Dunns Avenue Bank Improvements – Jason Recker (Stormwater and Waterways Manager)

127-144

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 230321039464.

(b) **Approves** the Council carrying out the rock placement works along Kairaki Creek (Saltwater Creek) adjacent to 87 Dunns Avenue Bank in Pines Beach for a sum of $25,000.

(c) **Notes** that this work will be funded by the drainage maintenance allocation from the Better Off Funding.

(d) **Notes** that $1,050,000 of the Better Off Funding was previously allocated by Council to 'Rural Land Drainage - Maintenance projects prioritised by staff in response to Climate Change' (refer TRIM 220911157300).

(e) **Circulates** this report to the Kaiapoi-Tuahiwi Community Board for their information.

5.4 Patronage figures for Public Transport Boardings from Park and Ride Sites – Don Young (Senior Engineering Advisor) and Peter Daly (Journey Planner / Road Safety Coordinator)

145-148

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** Report No. 230308032102.

(b) **Notes** the increase in boardings at these locations, over the past 18 months of Park and Ride operation.

(c) **Circulates** this report to the Rangiora Ashley Community Board and the Kaiapoi Tuahiwi Community Board for information.

6 CORRESPONDENCE

Nil.

7 PORTFOLIO UPDATES

7.1 Roading – Councillor Philip Redmond

7.2 Drainage, Stockwater and Three Waters (Drinking Water, Sewer and Stormwater) – Councillor Paul Williams

7.3 Solid Waste– Councillor Robbie Brine

7.4 Transport – Mayor Dan Gordon

8 MATTERS REFERRED FROM THE WOODEND-SEFTON COMMUNITY BOARD

8.1 Recommendation for proposed upcoming works at Norton Place, Woodend – Teifion Matthews (Project Engineer) and Jason Recker (Stormwater and Waterways Manager)

149-236

RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** Report No. 230224025812.

(b) **Approves** the recommendation to proceed with design and construction of the upgrading existing sump option in 2023/24.

(c) **Notes** that there will still be an issue of lack of secondary flow path out of Norton Place for extreme events. However the 50 year level of service is maintained to prevent flooding of private property, by routine sump maintenance. It is likely Council will continue receiving complaints due to ponding in road reserve and the time it takes for the water to drain away.

(d) **Notes** that this is a reduced scope of work from the previously accepted design of overland flow path through Norton Reserve and Hewitts Road and has come about due to the practical challenges and constraints of the current localised topography and construction estimate for this upgrade being beyond the available budget.

(e) **Notes** that in events great than 1 in 100 years, overland flow path will continue to follow the natural low point towards the property.

(f) **Notes** that this option can be integrated into any future stormwater upgrades along Hewitts Road.

9 MATTERS FOR INFORMATION

9.1 Request approval for Stop Controls on Powells Road at McJarrows Road / Victoria Street – Shane Binder (Senior Transportation Engineer)

(Report No. 230109001491 to the Oxford-Ohoka Community Board meeting of 6 April 2023)

RECOMMENDATION

THAT the Utilities and Roading Committee

(a) **Receives** the information in Item 11.1.

10 QUESTIONS UNDER STANDING ORDERS

11 URGENT GENERAL BUSINESS

12 MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED

In accordance with section 48(1) of the Local Government Official Information and Meetings Act 1987 and the particular interest or interests protected by section 6 or section 7 of that Act (or sections 6, 7 or 9 of the Official Information Act 1982, as the case may be), it is moved:

1. That the public be excluded from the following parts of the proceedings of this meeting:

Item 14.1	Report from Management Team meeting of 20 March 2023
Item 14.2	Report from Management Team meeting of 3 April 2023
Item 14.3	Report from Management Team meeting of 3 April 2023

The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter, and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution are as follows:

Meeting Item No. and subject	Reason for excluding the public	Grounds for excluding the public:-
14.1 Report from Management Team meeting of 20 March 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).
14.2 Report from Management Team meeting of 3 April 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).
14.3 Report from Management Team meeting of 3 April 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).

CLOSED MEETING

See Public Excluded Agenda (separate document)

OPEN MEETING

NEXT MEETING

The next meeting of the Utilities and Roading Committee will be held on Tuesday 23 May 2023 at 9am.

Workshop

- *Rangiora Cenotaph Corner Intersection Improvement Project – Heike Downie (Senior Advisor Strategy and Programme) 30mins*

MINUTES OF THE MEETING OF THE UTILITIES AND ROADING COMMITTEE HELD IN THE COUNCIL CHAMBER, RANGIORA SERVICE CENTRE, 215 HIGH STREET, RANGIORA, ON TUESDAY, 21 MARCH 2023, AT 9.00AM.

PRESENT

Councillor N Mealings (Chairperson), Councillors R Brine, P Redmond, J Ward, P Williams

IN ATTENDANCE

Councillors N Atkinson, B Cairns (via teams) and T Fulton.

J Millward (Acting Chief Executive), G Cleary (General Manager Utilities and Roading), J McBride (Roading and Transport Manager), K Simpson (Three Waters Manager), D Young (Senior Engineering Advisor), K LaValley (Project Delivery Manager), K Straw (Civil Projects Team Lead), R Kerr (Flood Recovery Programme Manager), T Matthews (Project Engineer), J Recker (Stormwater and Waterways Manager) and E Stubbs (Governance Support Officer).

1 APOLOGIES

Moved: Councillor Ward Seconded: Councillor Brine

That an apology for absence be moved and sustained from Mayor D Gordon.

CARRIED

2 CONFLICTS OF INTEREST

No conflicts of interest were declared.

3 CONFIRMATION OF MINUTES

3.1 Minutes of the meeting of the Utilities and Roading Committee held on Tuesday 21 February 2023.

Moved: Councillor Ward Seconded: Councillor Brine

THAT the Utilities and Roading Committee:

(a) **Confirms** the circulated Minutes of the meeting of the Utilities and Roading Committee held on 21 February 2023, as a true and accurate record.

CARRIED

3.2 Matters arising (From Minutes)

Nil

3.3 Notes of the workshop of the Utilities and Roading Committee held on Tuesday 21 February 2023

Moved: Councillor Redmond Seconded: Councillor Williams

THAT the Utilities and Roading Committee:

(a) **Receives** the circulated notes of the workshop of the Utilities and Roading Committee, held on 21 February 2023.

CARRIED

Unconfirmed

PUBLIC EXCLUDED MINUTES

(These Minutes were considered in the public excluded portion of the meeting)

3.4 Minutes of the public excluded portion of the Utilities and Roading Committee meeting Tuesday 21 February 2023.

4 DEPUTATION/PRESENTATIONS

4.1 Proposed Railway Road Cycleway – James Flanagan and Rebecca Parish (Rangiora PAK'nSAVE)

J Flanagan introduced himself as the owner/operator of Rangiora PAK'nSAVE and R Parish as Head of PAK'nSAVE Property South Island. He noted that they had presented to the Rangiora-Ashley Community Board when they considered the matter on 8 March 2023 (Trim: 230306030286).

J Flanagan explained that PAK'nSAVE had grave safety concerns regarding the cycleway, particularly with heavy vehicle movement through the loading operation on the corner of Station and Railway Roads. PAK'nSAVE also had concerns regarding locating the cycleway alongside the uncontrolled railway crossing on Railway Road.

R Parish commented on the obligation of the Council to prioritise Health and Safety. While they understood cyclists were important, they had significant concerns regarding the cycleway as heavy vehicles may accidentally veer into the cycleway, which children perceived as safe. She believed safety concerns should be considered prior to the detailed design phase and requested that the Council pause the process and consider safety.

Councillor Williams asked if there were other heavy vehicle movements in that area. J Flanagan noted several commercial operations, such as North Canterbury Truck and Trailer Services, Carters, Rangiora NPD Fuel Station and North Canterbury Engineering, which heavy vehicles visited regularly.

Councillor Williams further enquired if the heavy vehicles were using Marsh Road, and J Flanagan replied he did not believe so as the road was primarily shingle.

R Brine noted that 24,000 vehicles used Southbrook Road per day, of which over 1,000 were heavy vehicles and asked if it was PAK'nSAVE's position that Southbrook Road was a more viable option for cyclists. J Flanagan replied that they believed Railway and Southbrook Roads were both unsafe.

Councillor Redmond commented on concerns from residents regarding vehicles using Marsh Road – Waikoruru Road as a shortcut from the east to PAK'nSAVE. He asked how many heavy vehicle movements PAK'nSAVE had per day. J Flanagan advised there were between 20 to 30 vehicles between 7am and 5pm. The conditions on their resource consent were, however, for movements between 7am and 7pm.

Councillor Redmond further asked if the heavy vehicles route was specified in PAK'nSAVE's resource consent. J Flanagan commented that the routeing circuit was discussed heavily in the design phase.

Councillor Mealings questioned where PAK'nSAVE would consider installing the cycleway. J Flanagan believed the future eastern bypass link would be a good option, the road did not need to be present for the cycleway to be built.

Item 8.1 "Approval of Scheme Design for Consultation – Transport Choices Project 2 – Railway Road / Torlesse Street / Coronation Street / Country Lane" was taken at this time. The Minutes have been recorded as per the agenda.

Unconfirmed

5 REPORTS

5.1 **Flood Mapping Freeboard and Floor Level Technical Practice Note** – G Cleary (General Manager Utilities and Roading) and K LaValley (Project Delivery Manager)

K LaValley spoke to the report, which sought the Committee's recommendation to the Council to endorse the Flood Mapping Freeboard and Floor Level Technical Practice Note and associated process. As key points had been previously discussed at a Council workshop, she would take the report as read.

K LaValley had liaised with the Planning Unit following the discussion regarding recession planes at the previous workshop and noted that there were no changes in the Recession Plane Rules in the Proposed District Plan, and breaches to the Recession Plane would still trigger a Resource Consent. However, the Planning Unit were aware that finished floor levels could impact Recession Planes, and they were developing an approach to minor infringements with regard to Recession Planes.

Councillor Redmond asked how the Flood Mapping Freeboard and Floor Level Technical Practice Note fit the existing policy. K LaValley explained that there was an existing policy or practice note, however, the current practice followed the Draft Practice Note.

Councillor Williams questioned how accurate flood modelling was. K LaValley advised that district flood models had recently been reviewed and staff had confidence the models were robust. However, there were always uncertainties associated with models and allowances needed to be made for possible variances.

Councillor Williams asked if the three new pumps had been taken into consideration. K LaValley replied that the models were based on pumps and other infrastructure not operating, which provided additional confidence if there were failures. Councillor Williams asked about the probability of failure, and K LaValley explained that many factors needed to be considered, including power failure. The type of events considered for finished floor levels were more significant events that infrastructure could deal with. .

Moved: Councillor Redmond Seconded: Councillor Williams

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 200108001550.

AND

THAT the Utilities and Roading Committee recommends:

THAT the Council:

(b) **Endorse** the Flood Mapping Freeboard and Floor Level Technical Practice Note and associated process (Record No. 200106000520 and 220323042890).

(c) **Notes** that the processes and requirements in this Technical Practice Note will be used by staff when setting minimum floor levels in relation to building, subdivision and land development in the district.

(d) **Notes** that the Technical Practice Note may need to be revised once the Proposed District Plan is adopted to reflect the proposed changes to the natural hazards chapter.

Unconfirmed

(e) **Notes** that the Technical Practice Note was a living document and may be amended by the General Manager Utilities and Roading, 3 Waters Manager or Project Delivery Manager with any major changes to be brought to the Council for endorsement.

CARRIED

Councillor Redmond commented that the recommendation was to formalise Practice Notes already in use to minimise the risk of water entering houses. It was uncertain times with heavier and more frequent rainfall events, and foundation levels were something they could address now. The Council needed to consider the bigger picture by preparing for more significant events, which assisted in protecting people's larger asset.

Councillor Williams commented that he was not confident that flood mapping was 100% correct. However, it was important that the district was prepared for adverse events. He noted the extra building cost added to new builds, however, it was better to err on the side of caution.

Councillor Brine reflected on issues he had with found with raising floor levels and the effect that had on recession planes – The Council needed to bear in mind the consequences of decisions. He agreed that the Council needed to be looking to the future.

Councillor Mealings liked that the occupant as well as neighbouring properties were protected. It was also providing clarity to staff to stand by recommendations. With minimum standards it could difficult to make the case that something better could be done. Minimum floor levels were set to protect dwellings, however, in low-lying areas it was not always possible to rely on engineering solutions.. It was important to future proof as much as possible.

Councillor Redmond appreciated there were costs involved, however it was the Council who was blamed following adverse events.

5.2 **Ashley Street Stormwater Upgrade** – T Matthews (Project Engineer), J Recker (Stormwater and Waterways Manager)

J Recker provided a brief background on the Ashley Street Stormwater Upgrade. He noted that the scope of work had been reduced from since the previously accepted design. Further modelling and cost/benefit analysis had found that the full benefits of the project would not be realised until the capacity in the downstream North Drain had been improved. The work to upgrade the existing sumps would not increase capacity, however, would reduce the risk of blockages which had been identified in several flood events. The proposed work did not prevent further upgrade of the stormwater system in the future.

Moved: Councillor Williams Seconded: Councillor Redmond

THAT the Utilities and Roading Committee:

(a) **Receives** Report No. 230308032092.

(b) **Approves** the recommendation to upgrade the existing sumps to back entry double sumps along Kingsbury Avenue.

(c) **Notes** that this was a reduced scope of work from the previously accepted design of stormwater pipe upgrades on Kingsbury Avenue and Ashley Street, and had come about due to the construction estimate for this upgrade being beyond the available budget.

Unconfirmed

(d) **Notes** that Council staff would monitor any future flooding along Good Street, Kingsbury Avenue and Golding Avenue intersection. When capacity improvements were made in North Drain, Council should consider the stormwater capacity upgrade to further reduce the depth of flooding.

(e) **Notes** that a road reseal was planned for this area in 2024/25 financial year, so any future upgrades would require trenching through the new seal.

(f) **Notes** that a water renewal was to be included within the same contract, however, this would now likely be done as a standalone project, which was expected to increase its cost.

(g) **Notes** that the Council would continue receiving complaints with the time it takes for the water to drain away.

CARRIED

Councillor Williams believed it was a sensible approach and staff could come back if needed.

Councillor Redmond supported the recommendation and commented the original design had a large cost with minimal benefit when the main issue was downstream.

Councillor Mealings believed it was a common-sense approach that did not discount the ability to upgrade in the future.

5.3 **July 2022 Flood Response Update** – K Simpson (Three Waters Manager), J McBride (Roading and Transport Manager) and R Kerr (Flood Recovery Programme Manager)

R Kerr noted it was a progress update report following on from previous reports. There were 21 investigations remaining to complete. While those remaining were the most difficult, they were being worked through. The capital works investigations would flow through into future decisions.

R Kerr highlighted three tables in the report, firstly related to capital works undertaken under the emergency works budget at an approved $3.82 million, secondly the proposed works for the next and subsequent financial years which were in the current forecast and thirdly around $2 million of work which was currently unfunded.

Councillor Mealings asked for clarification on the Bradleys Road/ Vicenza culvert upgrade and K Simpson advised that R Kerr and team were working with landowners, a contractor had been engaged and work would begin in the near future. It was a cost share arrangement with the landowner.

Moved: Councillor Ward Seconded: Councillor Williams

THAT the Utilities and Roading Committee:

(a) **Receives** Report No. 230306030501.

(b) **Notes** that investigations, funded physical works and maintenance actions arising from the July 2022 floods were well advanced, with the majority expected to be completed prior to winter 2023.

Unconfirmed

(c) **Notes** that the investigations were identifying a range of potential capital projects which were being managed as follows:

- Three projects with a combined estimated costs of $790,000 were proposed in the FY23/24 draft Annual Plan.
- Nine projects with a combined estimated cost of $6.35 million were included in outer years of the long Term Plan.
- A further ten projects that were currently not included in any forecasts would be investigated and scoped further and offered for consideration in the next Long Term Plan process (2024-2034) or the Three Water Reforms Transition process.

(d) **Circulates** this report to all Community Boards for information.

CARRIED

Councillor Ward thanked staff commenting it was work that needed to be invested in. Councillor Williams had confidence pumps would not fail.

6 CORRESPONDENCE

Nil.

7 PORTFOLIO UPDATES

7.1 **Roading** – Councillor Redmond

- Kerb and Channel Renewals
  Good Street was progressing well and work on Geddis Street would begin soon.
- Butchers Road Culvert
  Was nearing completion.
- Southbrook Road / Torlesse Street / Coronation Street Intersection
  Work was continuing on the intersection.
- Mulcocks Road Right Turn Bay
  Work had begun on the installation of the Right-turn-bay on Skewbridge Road at Mulcocks Road. Construction would be complete toward the end of March.
- Pavement Rehabilitation
  Failed areas on Oxford Road were being addressed.
  Revells Road rehabilitation was in progress.
- Footpath Renewal
  Eyre Place and Otaki Street in Kaiapoi were underway.
- Gravel Roads
  Had received a number of complaints regarding the state of shingle roads in the district, J McBride and G Cleary had advised they were addressing some of the those issues.

7.2 **Drainage, Stockwater and Three Waters (Drinking Water, Sewer and Stormwater)** – Councillor Williams

Water:

- Temporary Chlorination Update
  Feedback for the Cust Application had been submitted to the Water Regulator. Communications regarding chlorination would be going out soon.
- Monthly Compliance
  The report had been electronically submitted.

Unconfirmed

Wastewater:

- Treatment Plants
  Planting at Woodend and Kaiapoi Treatment plants was planned for spring.

Stormwater:

- Max Wallace Drive
  Residents had raised a number of drainage issues.
- Drainage Advisory Groups
  Meetings had been well attended.
  An Ohoka Stream walk was to be held this Thursday with Advisory members.

7.3 **Solid Waste** – Councillor Brine

Kerbside Collections:

- Bin Audits:
  28% of bins were contaminated, 3% received a gold star and the remainder received 'educations'.
- There had been several missed areas in recent months which was to be taken up further with Waste Management.
- All collections scheduled for ANZAC Day would be scheduled for collection the following day.

Southbrook RRP:

- A new manager had been appointed at the transfer station.

Cust Rural Recycling Facility

- CCTV Cameras had been installed at Cust.

7.4 **Transport – Mayor Dan Gordon**

Mayor Gordon was not present to provide a report.

8 MATTERS REFERRED FROM THE RANGIORA-ASHLEY COMMUNITY BOARD

8.1 Approval of Scheme Design for Consultation – Transport Choices Project 2 – Railway Road / Torlesse Street / Coronation Street / Country Lane – K Straw (Civil Projects Team Leader), A Kibblewhite (Senior Project Engineer) and J McBride (Roading and Transportation Manager)

D Young introduced the report noting that this, and the three following cycle route reports, had been considered by the relevant Community Boards and referred to the Committee for approval. During Board consideration the cycle routes had been reviewed section by section in a detailed manner. The purpose of the report was to approve the scheme concept to go out for consultation. This phase of consultation was not for the whole community, however, would rather focus on affected parties on route including PAK'nSAVE as a key stakeholder.

Unconfirmed

D Young reported that the Council had already adopted the Cycle Network Plan which had effectively approved the routes. There had been some discussion that PAK'nSAVE may not have been appropriately consulted, and staff recognised in hindsight that there could have a better engagement with interested parties. Staff, was aware of PAK'nSAVE's concerns, however, if the Committee chose to delay the work the Council would lose the external funding and the cycleway would therefore not be constructed. Currently the Council had only a $500,000 annual budget for cycleways which would be insufficient for the work to be done satisfactory. If Council chose to fully fund the work there would be a significant impact on rates.

D Young believed the identified safety concerns were manageable with a wide range of engineering options, such as barriers or requiring cyclists to get off their bikes. He acknowledged that the design would require careful consideration to maximise safety, however this would be an opportunity to build a safe place for cyclists to pass through the area. While the Railway Road cycle route from Southbrook to the Town Centre had challenges, it remained the best option. There were significant heavy vehicle movement associated with M10, and any cyclist interaction on Flaxton and Todds Roads further impact congestion on Southbrook Road.

D Young reiterated that the scheme concept had been recommended from the Rangiora-Ashley Community Board for approval. During their consideration of the matter the Board had been through the design page by page and the issues had been clearly laid out.

Councillor Mealings referred to the intersection redesign and enquired if there was any opportunity to create more room for vehicle turning. K Straw advised that a consultant would be engaged to look at potential future layouts of the level crossing intersection area. KiwiRail and WSP were investigating broader opportunities to improve the intersection. What had not been considered was a minor or intermediate upgrade which could be done as part of the cycleway work and improve the turning circle.

Councillor Williams noted his concerns regarding children cycling on busy roads. He asked if staff could present a report addressing whether the funding would be better spent to start the cycle route on the eastern bypass link and bring that work forward. It would link Southbrook with the MainPower Sports Stadium and keep children safe. He knew the landowner would work with the Council on the project. D Young noted that was the decision of the Committee, however, he cautioned about the significant complexities and timeframe required with that approach. Currently, the Council did not own and had no rights to the land required, as the designations over the required land for the road were going through the Proposed District Plan process. In addition, funding for the project was not budgeted for another 10 to 13 years, and while that could be brought forward, there were still significant negotiations with the landowners to work through, including its significant impact on active farm operations. Furthermore, the purpose of the route was to link the Passchendaele path to the Rangiora Town Centre, a path through a paddock to the east may be underutilised as it did not take cyclists to the town centre.

Councillors Mealings and Redmond questioned if urgent reconsideration of the southern portion of the cycleway would impact the funding available for the project. D Young advised that the deadline for funding was the end of June 2024. However, he believed that achieving a detailed design that staff had confidence in, that left the State Highway and ran along an undetermined route through the Council sewerage area and paddocks, across Marsh Road, with a rail crossing would not be achievable in the required timeframe. In addition, the Council would also need to make changes to the application for funding and provide an explanation for changing the route that had funding approval. Finally, he advised that staff would not be able to provide a very high-level feasibility report in a month.

In response to a question from Councillor Ward, D Young noted that all routes considered had been through a multi-criteria analysis to consider a range of matters. The route west of Mitre10 had scored poorly on the health and safety due to several issues, including the garage, the Flaxton Road intersection and the Ellis and Todds Roads intersection (which had many heavy vehicle movements).

Unconfirmed

Councillor Ward again enquired about the eastern bypass route. D Young noted that staff were prepared to abide by the Committee's decision, however he reiterated his previous concerns about the narrow timeframe, the complexities of negotiations, and lack of current funding. G Cleary highlighted that to put in a route along the future eastern road link would realistically take years. He further explained that currently there were two recognised significant deficiencies in the cycle network. The first was the roundabout at Pegasus/ Ravenswood and the second was Southbrook and these deficiencies were immediate issues. Funding was available to provide the best route that staff had been able to design, which closed the gap and completed the route from the centre of Rangiora to Christchurch. PAK'nSAVE had outlined their concerns and advice from staff was that they were willing to work with them to try and elevate their concerns. The advice from staff was therefore that any delay would create a risk of not being able to complete the project while the funding window was available. G Cleary added that he believed a future cycle link along the eastern bypass was essential, however, that would be supplementary to the Southbrook route rather than a replacement.

Councillor Mealings asked if approving the scheme concept today would prevent staff from pursuing other avenues if it was determined during the consultation phase that effective solutions could not be found. D Young explained that the pre-implementation funding had been approved, and the next big goal was to submit the implementation plan for which the Council would seek the construction costs from Waka Kotahi. The implementation report plans were detailed, and if in two to three months' time there was uncertainty about design there was significant risk that the implementation funding would not be approved.

Councillor Mealings questioned if staff believed they had enough options to work through to find solutions for issues on the cycle route. D Young was confident there were, he highlighted that a key part of the process was the Road Safety Audit that would be carried out to provide an independent, expert review on the design. Staff were happy to work with appropriate parties in order to do all that was possible to minimise risk, for example PAK'nSAVE may choose to engage their own Road Safety expert to provide evidence toward design.

Councillor Brine sought clarity on the traffic movements on Southbrook Road and heavy vehicle statistics, however, staff did not have them on hand, but traffic counts indicated heavy vehicle numbers were not insignificant. Councillor Brine then asked if K Straw and D Young were both qualified engineers and it was confirmed they were.

Councillor Fulton asked if it would be possible to develop a portion of the trail as a gravel track on the eastern route with minimal encumbrance on the landowner. D Young advised that discussion could be had with the landowner if the Committee requested.

Councillor Redmond commented that the need for safety as paramount and D Young explained that 100% was not an achievable or appropriate level to guarantee. Staff aimed for zero risk, however, there was an element of judgement. Councillor Redmond then asked if a Safety Audit could be completed now and brought back to the Committee for the following meeting and staff advised that was possible.

Councillor Williams was concerned that securing funding for the cycleway was being placed before the safety of the children who would be using it. He did not see an alternative to the eastern route, as all other links had heavy vehicle traffic. D Young noted that staff believed the recommended scheme concept would achieve both safety and secure funding. He commented that Rangiora was not alone in having heavy vehicle traffic and many cycleways were currently being constructed to make that interaction safer.

Unconfirmed

Councillor Atkinson asked if the possibility of having the cycleway along the railway line on the opposite side of the tracks had been considered. D Young advised that the option had been raised, however, had not yet been explored in depth. Nonetheless staff were very much engaged with KiwiRail in discussing the intersection and he believed it was a good suggestion that could be put forward to KiwiRail.

Moved: Councillor Williams Seconded: Councillor Ward

THAT the Utilities and Roading Committee:

(a) **Requests** a Safety Audit of the proposed scheme concept in relation to Southbrook.

(b) **Requests** a reconsideration of alternative routes in the Southbrook area**.**

(c) **Notes** staff will present a further report to the next Utilities and Roading Committee meeting.

CARRIED

A Division was called
For: Councillors Redmond, Ward and Williams
Against: Councillors Brine and Mealings
3:2

Councillor Williams had significant concerns regarding the safety of children using the cycleway, with the issues raised by PAK'nSAVE the largest barrier. It was not just the 20 daily truck movements from PAK'nSAVE, but also the other businesses in the area that had heavy vehicle movements. He did not feel confident that a safe environment could be created for children. Councillor Williams also believed that the consultation needed to be wider to include people from all over Rangiora who would use the cycleway. Due to the uncertainties regarding use of agricultural land or a path along the railway line, he believed further work was required.

Councillor Ward was supportive of the motion as she believed there needed to be further research into the possibility of using the land adjacent to the railway line or the farm. She noted the health and safety concerns around Mitre 10 and believed they were relevant to the proposed route also. With a change of Government funding may be immediately available for a bypass link. In the meantime the Council needed to find a solution for a safe route and she therefore suggested a pause to find an interim solution until construction of the eastern link road and cycleway to connect Passchendaele to Northbrook Road.

Amendment

Moved: Councillor Mealings Seconded: Councillor Brine

THAT the Utilities and Roading Committee:

(a) **Approves** the Scheme Concept as per Attachment i of this report for the purposes of consultation.

(b) **Notes** that staff would present the approved Scheme Concept to directly impacted residents and stakeholders for feedback**.**

(c) **Notes** that feedback from the consultation would be fed into the Detailed Design, and that the Detailed Design will be reported back to the Board in May 2023.

(d) **Notes** the scheme concept requires the removal of seven on street car parking spaces at the locations detailed within the draft No Stopping Schedule included as Attachment iii of this report, and that the final approval of any parking spaces to be removed will be included within the detailed design report in May 2023.

Unconfirmed

(e) **Notes** that any parking to be removed as result of the Scheme Concept would be communicated directly with the immediate adjacent residents.

(f) **Notes** that the scheme concept required the removal of 12 existing street trees, which were required to be replaced in alternative locations as noted in attachment iv of this report, and that final approval of the removal of any street trees would be included within the detailed design report in May 2023.

(g) **Notes** that the removal of street trees had been discussed with Greenspaces, who are represented on the Project Control Group. Greenspace are supportive of the removal of the identified trees provided that they are replaced elsewhere along the length of the route.

(h) **Notes** that this project is funded through the "Transport Choices" funding stream (which was still subject to final signing and confirmation), and this requires that all works is complete by June 2024.

(i) **Notes** that the funding agreement between Waka Kotahi and the Waimakariri District Council is dependent on the site having been though an independent Road Safety Audit process, which will proceed upon acceptance of this report, and that the safety audit may result in further minor design changes.

(j) **Notes** that other options can be pursued if adequate solutions cannot be found with affected parties.

LOST

A Division was called
For: Councillors Brine and Mealings
Against: Councillors Redmond, Ward and Williams
2:3

The resolution was lost and the original motion remained the substantive motion

Councillor Mealings commented that the recommendation to approve the scheme concept came from the Rangiora-Ashley Community Board who had discussed the matter robustly and in detail. Cycleways improved safety and were not just for children getting to school, there were many people in and outside of the district who used cycleways. The route was the most direct path on the roads that they had available, while the eastern bypass was in planning, there was not a date for that yet and there was a lot that needed to be completed first. Southbrook Road was unsafe for cyclists and the Council ran the risk of losing the opportunity to improve safety for cyclists through Southbrook due to the required timeframes. The recommendation was to approve the scheme concept to go for consultation and work with affected parties such as PAK'nSAVE to ascertain if a solution could be found. This approach was the only way to retain the funding that Council had and it was not prioritising funding over safety. She did not know if the Railway Road route would be any safer, however, she would like to find out. She believed the recommendation from the Community Board provided the most leeway and options to explore all possibilities.

Councillor Brine agreed with the sentiments of Councillor Mealings. The cycleway was not just for children. He was a regular cyclist through Southbrook and he currently walked his bike through sections as in reality it was too dangerous to ride. He was frustrated by comments by colleagues regarding the eastern bypass as the Council had been advocating for the bypass for over 20 years, and there was no guarantee that it would be built. He did not believe there was a comparison between the 30 to 40 traffic movements behind PAK'nSAVE and the dangers cyclists currently faced on Southbrook Road. He urged Councillors to listen to the recommendations of the two highly qualified engineers before them.

Unconfirmed

Councillor Atkinson noted that he did not have a vote on the matter, however, agreed with Councillor Brine. Recommendation (j) allowed the design to proceed with the 90% of the cycleway that there was no argument with, while still investigating options in the PAK'nSAVE area. He did not believe money was being put over safety, the money was available and staff were working to make funding fit a recognised project, that approach did not take away from safety – Waka Kotahi, KiwiRail and the Council would never allow that. He believed the project should be allowed to proceed and noted that the public consultation would provide further feedback to be fed into the Detailed Design. He suggested developing a cycleway through farmland may be suitable as a recreational route, however, would not be meet the needs of commuters or those cycling to schools. The cycleway was not just for cyclists but also for modes such as walking and mobility scooters and their needs also needed to be considered. He urged Councillors to support the amendment as provided the opportunity to move forward while also investigating other options.

Councillor Mealings commented that mixed use paths were being created all around the country for the purpose of trying to make alternatives to vehicle use safer. The proposed route was the shortest line between two destinations and whenever people were not in a vehicle that was important. The recommendations did not preclude finding a good solution to the area that raised concern. If it was found through consultation and design that an adequate solution could not be found, then the decision to not proceed could be made then and nothing was lost. She urged members to make best use of the funding provided by Waka Kotahi. Delay now would mean losing funding leaving ratepayers to foot the bill in the future.

Councillor Ward commented that the funding expired at the end of June 2024. This provided time for staff to report back to the following Utilities and Roading meeting regarding further options. There were potentially safer routes such as the eastern side of the railway line, or through farmland that should be explored. She reiterated the need to pause the process to look at safer options, and believed that could be achieved without holding up the process for too long or impacting on funding.

Councillor Redmond supported the motion as he believed there needed to be further information around safety aspects and he was sympathetic to the concerns expressed by PAK'nSAVE. Rather than a 'build it and they will come' approach he would like to know if there were alternative routes and the safety aspects of the existing scheme design.

Councillor Brine did not support the motion. He compared the two truck movements an hour on Railway Road to the large number of truck movements on Southbrook Road. In front of them they had two qualified engineers and two people with a good knowledge of the area – it must be possible to find a solution that was able to remove cyclists from Southbrook Road. The eastern bypass was not a solution at this time and it still required funding. He referred to his 41 years of road safety experience as a member of the police.

Councillor Williams in his right of reply believed there were many more than two truck movements on Railway Road when other businesses were taken into consideration. He did not believe the motion to further investigate options for safety was holding things up. The National Government had indicated they would support the Eastern Bypass.

Unconfirmed

8.2 **Approval of Design – Transport Choices Project 4 – Rangiora On-Road Cycle Lane** – K Straw (Civil Projects Team Leader), Allie Mace-Cochrane (Project Engineer) and J McBride (Roading and Transportation Manager)

K Straw and D Young introduced the report noting that the recommendation was to approve the design. If approved it would move forward to implementation and there would be discussion with impacted residents as the project progressed. The report would be taken as read and staff were happy to answer any questions.

D Young noted that they had just received an email from Waka Kotahi who had expressed some concern around the interaction between cycles and traffic. Barriers had been designed in some key parts and staff would go back to Waka Kotahi to discuss in further detail. Any material changes to design would be brought back to the Rangiora-Ashley Community Board.

Moved: Councillor Ward Seconded: Councillor Brine

THAT the Utilities and Roading Committee:

(a) **Approves** the Design as per the Design Drawing Set (Trim 230216020671), noting that the staff would then implement the works.

(b) **Approves** the No Stopping Schedule as per the Schedule of No Stopping Restrictions (Trim 230217021456).

(c) **Notes** that staff would inform impacted residents and stakeholders prior to works being implemented.

(d) **Notes** that the works as designed would result in the loss of 40 on-street, car parking spaces, though out the length of the project, at the locations specified within the Schedule of No Stopping Restrictions (Trim 230217021456).

(e) **Notes** that this project is funded through the “Transport Choices” funding stream (which was still subject to final signing and confirmation), and this requires that all works were completed by June 2024.

(f) **Notes** that the funding agreement between Waka Kotahi and the Waimakariri District Council was dependent on the site having been through an independent Road Safety Audit process, which would proceed upon acceptance of this report, and that the safety audit may result in further minor design changes.

CARRIED

Councillor Ward thanked staff for their work.

Councillor Williams advised that he had voted against the recommendation at Community Board level, however, was now happy to support. He wanted the Council to be mindful that another 40 carparks were being lost for the project.

Unconfirmed

9 MATTERS REFFERED FROM THE WOODEND-SEFTON COMMUNITY BOARD

9.1 **Approval of Scheme Design for Consultation – Transport Choices Project 3 - Woodend to Pegasus Footpath** – K Straw (Civil Projects Team Leader), A Mace-Cochrane (Project Engineer) and J McBride (Roading and Transportation Manager)

K Straw and D Young spoke to the report which had been through a similar process as the previous cycleway reports. The main issue from a Waka Kotahi perspective was that they had not picked up that the footpath between Woodend and Pegasus was not part of the Transport Choices funding application. The section would be addressed as part of future walking and cycling links.

At the northern end of the link (exiting Woodend) the design involved utilising the shoulder of the state highway as the berm had a large drain and power poles present. Staff believed it was an effective use of space, however Waka Kotahi had yet to come back in agreement meaning there was potential for a material change to design in that location. D Young noted that the recommendation was for scheme design approval and drop in sessions would be held.

Councillor Mealings asked what were the ramifications on the recommendation if it were not possible to use the road shoulder exiting Woodend. D Young said there was the possibility to mitigate by increasing safety elements around it, otherwise it may result in a change of alignment. Any material change would need to return to the Committee for consideration.

Moved: Councillor Redmond Seconded: Councillor Brine

THAT the Utilities and Roading Committee:

(a) **Approves** the Scheme Design as per Attachment i of this report for the purposes of consultation.

(b) **Notes** that staff would present the approved Scheme Design to directly impacted residents and stakeholders for feedback.

(c) **Notes** that feedback from the consultation would be fed into the Detailed Design and that the Detailed Design would be reported back to the Woodend-Sefton Community Boards and the Utilities and Roading Committee in May 2023 for their approval before procurement begins.

(d) **Notes** that the Scheme Design would be distributed to Greenspace's Landscape Architect for comment around amenity options, which would be fed into the Detailed Design and reported back to the Community Board, and Utilities and Roading Committee.

(e) **Notes** that the Scheme Design requires the removal of 40 on-street car parking spaces at the locations detailed within the draft parking removal schedule included as attachment iii. of this report, and that the final approval of any parking spaces to be removed will be included within the detailed design report in May 2023.

(f) **Notes** that any parking to be removed as a result of the Scheme Design would be communicated directly with the immediately adjacent residents.

(g) **Notes** that staff have designed two links; one as a connection to Pegasus and one as a connection to Ravenswood. Both of these were on the approved Network Plan, however, the Transport Choices Funding application only allowed for the Ravenswood connection.

Unconfirmed

(h) **Notes** that the Pegasus footpath connection would only proceed if there was adequate budget to do so.

(i) **Notes** that staff were working closely with Waka Kotahi to co-ordinate this cycleway project with the planned Woodend Safety Improvement project that was currently being designed.

(j) **Notes** that this project was funded through the "Transport Choices" funding stream (which was still subject to final signing and confirmation), and this required that all works be complete by June 2024.

(k) **Notes** that the funding agreement between Waka Kotahi and the Waimakariri District Council was dependent on the site having been though an independent Road Safety Audit process, which would proceed upon acceptance of this report, and that the safety audit may result in further minor design changes.

(l) **Notes** a small corner snipe of land may be required for the purposes of constructing the cycleway, and that staff upon approval of this report would enter negotiations with the relevant land owners to purchase the required land, noting that a report approving purchase would be brought back to the Council.

CARRIED

Councillor Redmond noted that the project was discussed intensively at the Woodend-Sefton Community Board meeting, and acknowledged the time staff had put into attending Board meetings and detailing the schemes map by map. The Board had been supportive of the proposal, the only issue raised was the removal of on street carparking. Where there was parking to be removed the Board request that removal of carparking be communicated to residents.

10 MATTERS REFFERED FROM THE WOODEND-SEFTON AND KAIAPOI-TUAHIWI COMMUNITY BOARDS.

10.1 **Approval of Scheme Design for Consultation – Transport Choices Project 1** - Woodend to Kaiapoi Cycleway – K Straw (Civil Projects Team Leader), G Kempton (Senior Project Engineer) and J McBride (Roading and Transportation Manager)

D Young introduced the report noting that it had been presented to both the Woodend-Sefton and Kaiapoi-Tuahiwi Community Boards in some detail with good comments and questions. There had considerable discussion with Kaiapoi-Tuahiwi around recommendation (a) and they had added to the recommendation the note that staff would take into consideration the issues raised by the Board. The Board did not want to hold up the process but wished for staff to consider around 8-10 different elements as they progressed with the project. In particular there had been some good conversation around reconsideration of the Smith Street/ Sidey Quay alignment.

Councillor Mealings asked about properties occupying road reserve. D Young advised there were 7-8 properties with varying occupation of the road reserve. Staff had door-knocked these properties and everyone met had been aware they were occupying road reserve and were happy to work with Council.

Moved: Councillor Redmond Seconded: Councillor Mealings

THAT the Utilities and Roading Committee:

(a) **Approves** the Scheme Design as per Attachment i of this report for the purposes of consultation noting the matters that staff had indicated they would consider or amend.

Unconfirmed

(b) **Approves** the amendment of the Walking and Cycling Network Plan to include Ranfurly Street (between Walker Street and Smith Street) in lieu of Walker Street and Bridge Street.

(c) **Approves** the change in priority at the Ranfurly Street / Dale Street intersection, with Dale Street being required to "STOP" for traffic on Ranfurly Street and Old North Road.

(d) **Approves** the implementation of a "Give Way" priority control at the Sandhills Road / Fullers Road intersection, giving the Sandhills Road traffic priority.

(e) **Notes** that the Scheme Design was based on an Off-Road shared Path for the full length of Old North Road.

(f) **Notes** that staff would present the approved Scheme Design to directly impacted residents and stakeholders for feedback.

(g) **Notes** that district wide consultation completed mid 2022 included two options to get this cycleway from Smith Street to Pineacres, and that "Option B" is the option preferred by staff and recommended within this report.

(h) **Notes** that feedback from the consultation would be fed into the Detailed Design, and that the Detailed Design would be reported back to the Community Boards and the Utilities and Roading Committee in May 2023 for their approval before procurement begins.

(i) **Notes** that the scheme design requires the removal of five on-street car parking spaces on Ranfurly Street at Sidey Quay and that the final approval of any parking spaces to be removed will be included within the detailed design report in May 2023.

(j) **Notes** that any parking removal as result of the Scheme Design would be communicated with the immediate adjacent residents.

(k) **Notes** that upon acceptance of this report, the Council's Property Team would commence work with various stakeholders to create new easements as required to allow the route to progress, and that the relevant stakeholders were willing to support the project.

(l) **Notes** that the recommendations within this report would require the reclamation of road reserve currently occupied by private residencies along Old North Road, and that this had been discussed with the relevant property owners.

(m) **Notes** that staff were working closely with Waka Kotahi to co-ordinate this cycleway project with the planned Woodend Safety Improvement project that was currently being designed.

(n) **Notes** that this project is funded through the "Transport Choices" funding stream (which was still subject to final signing and confirmation), and this requires that all works was complete by June 2024.

(o) **Notes** that the funding agreement between Waka Kotahi and the Waimakariri District Council was dependent on the site having been though an independent Road Safety Audit process, which would proceed upon acceptance of this report, and that the safety audit may result in further minor design changes.

(p) **Notes** a small piece of land would be required for the purposes of constructing the cycleway, and that staff upon approval of this report would enter negotiations with the relevant land owners to purchase the required land, noting that a report approving purchase would be brought back to the Council.

Unconfirmed

(q) **Notes** that the revised scheme design incorporating suggested amendments would be reported back to the Kaiapoi-Tuahiwi Community Board.

CARRIED

Councillor Redmond noted that he had included the final recommendation so that any amendments could be reported back to the Kaiapoi-Tuahiwi Community Board. There had been good discussion and a number of helpful suggestions from members.

Councillor Mealings commented that retrofitting cycleways was always complex and at the granular level staff would be dealing with individual property owners.

Councillor Brine noted the approach taken by the Committee to allow this project to continue while continuing consultation, compared to the pause on the cycleway project earlier in the agenda.

Councillor Redmond, in right of reply, commented that there had been no contentious issues with this link, rather constructive discussion around minor details.

11 MATTERS FOR INFORMATION

11.1 **Cust Water Main Renewals 2022/23 – Request to Engage Water Unit** – J Singh (Civil Design / CAD Technician) and S Fauth (Utilities Projects Team Leader)

(Report No. 230214019258 to the Management Team meeting of 20 February 2023)

Moved: Councillor Ward Seconded: Councillor Brine

THAT the Utilities and Roading Committee:

(a) **Receives** the information in Item 11.1.

CARRIED

12 QUESTIONS UNDER STANDING ORDERS

Nil.

13 URGENT GENERAL BUSINESS

Nil.

14 MATTERS TO BE CONSIDERED WITH THE PUBLIC EXCLUDED

In accordance with section 48(1) of the Local Government Official Information and Meetings Act 1987 and the particular interest or interests protected by section 6 or section 7 of that Act (or sections 6, 7 or 9 of the Official Information Act 1982, as the case may be), it was moved:

Moved: Councillor Ward Seconded: Councillor Brine

THAT the public is excluded from the following parts of the proceedings of this meeting

The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter, and the specific grounds under section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution are as follows:

Unconfirmed

Meeting Item No. and subject	Reason for excluding the public	Grounds for excluding the public
14.1 Minutes of public excluded portion of Community and Recreation Committee meeting of 21 February 2023	Good reason to withhold exists under section 7	To protect the privacy of natural persons, including that of deceased natural persons (s 7(2)(a)).
14.2 Report from Management Team meeting of 6 March 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).
14.3 Report from Management Team meeting of 6 March 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).
14.4 Report from Management Team meeting 13 March 2023	Good reason to withhold exists under section 7	To carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations) (s 7(2)(i)).

CARRIED

CLOSED MEETING

The Public Excluded section of the meeting occurred from 11.30am to 11.35am.

OPEN MEETING

Moved: Councillor Williams Seconded: Councillor Mealings

THAT open meeting resumed and that the business discussed with the public excluded remains public excluded.

CARRIED

NEXT MEETING

The next meeting of the Utilities and Roading Committee would be held on Tuesday 18 April 2023 at 9am.

THERE BEING NO FURTHER BUSINESS THE MEETING CONCLUDED AT 11.35AM.

Unconfirmed

CONFIRMED

_____
Chairperson

_____
Date

Unconfirmed

NOTES OF A WORKSHOP OF THE UTILITIES AND ROADING COMMITTEE HELD IN THE COUNCIL CHAMBERS, 215 HIGH STREET, RANGIORA ON TUESDAY, 21 MARCH 2023, AT 11.40AM.

PRESENT:

Councillor N Mealings (Chairperson), Councillors R Brine, P Redmond, J Ward, P Williams.

IN ATTENDANCE

Councillors N Atkinson and T Fulton.

J Millward (Acting Chief Executive) G Cleary (General Manager Utilities and Roading), T Tierney (General Manager Planning, Regulation and Environment), K Waghorn (Solid Waste Asset Manager), D Young (Senior Engineering Advisor), G Kempton (Senior Project Engineer), J McBride (Roading and Transport Manager), B Charlton (Environmental Services Manager), W Taylor (Building Unit Manager), B Wiremu (Emergency Management Advisor), M Bacon (Development Planning Manager), E Stubbs (Governance Support Officer) and A Connor (Governance Support Officer).

Consultant Lisa Eve

APOLOGIES

Mayor Gordon.

1. **WASTE ASSESSMENT AND WASTE MANAGEMENT MINIMISATION PLAN REVIEW** – K Waghorn (Solid Waste Asset Manager) and L Eve (Consultant - Eunomia)

   Key points:

   - The Central Government had delayed the container return scheme.
   - Release of the Draft New Zealand Waste Strategy – (focus on circular waste economy) was imminent.
   - Comment on methane capture calculations for Kate Valley.
   - Bin audits had shown bags and small wheelie bins promoted better waste behaviour than large wheelie bins.
   - Waimakariri District topped New Zealand in waste volumes.
   - It was recommended that the Council complete a new Waste Assessment and review the Waste Management Minimisation Plan (WMMP) with a new vision and new targets.

   Questions:

   - Where did the expected lifetime of Kate Valley factor into methane capture calculations?

     The expected lifetime was 150 years, methane release varied over the lifetime of a facility and slowed over time, a 95% capture was not realistic.

   - How long did organic matter release methane before it was exhausted?

     Food had a half-life of three months, while treated timber waste had half-life of 80 to 100 years.

   - What was the best disposal option for food waste if a composting facility did not take food waste? Was there a benefit to landfill methane capture with food waste present?

     Composting facilities would take food waste and mix it with green waste. Overall, it was better to keep organic waste out of the landfill as organic matter was a resource that could be put to better use.

- Was it necessary for the Council to complete a new WMMP considering the Waimakariri was already far ahead of other Councils.

  It would be appropriate to set some targets to reflect the work program, for example, focusing on construction waste.

- How realistic was the Christchurch City Council in their vision for zero waste?

  It was an aspirational term that was misunderstood, and the concept should be thought of in terms of a zero-waste circular economy. If something had an alternative use it should not go in a landfill.

- Should the Council take the approach with the WMMP that 'if it's not broke don't fix it'.

  It may well be that the current targets were realistic, however, there may be areas that could be looked at for example construction waste. Under the National WMMP Act the Council could not receive levy funds without completing a WMMP at least every six years.

- Should the Council delay the WMMP until the release of the Draft New Zealand Waste Strategy.

  Staff could continue to work through the process with the understanding the strategy was imminent.

The Utilities and Roading Committee Workshop Session adjourned at 11.40am and resumed at 2.29pm.

2. **SOUTHBROOK RRP LAYOUT PLANS** – Ky Waghorn (Solid Waste Asset Manager) and D Young (Senior Engineering Advisor)

Key Points:

- The facility met basic needs, however, was having capacity issues and did not meet standards of minimising waste.
- Staff prefer Option One.

Questions:

- Had staff considered utilising the trains for commuting rubbish?

  They had, however, it was found that there would be too much handling of the rubbish as it would have to be put on the trains, unloaded at the other end, reloaded onto a truck and then unloaded again at the end.

- Was a land swap still an option.

  There were valuations being done at the moment regarding a land swap and that would go back to the committee for decision.

3. **RIVER ROAD URBANISATION** – J McBride (Roading and Transport Manager) and G Kempton (Senior Project Manager)

Key points:

- Budget for this work was currently $360,000 for construction and $40,000 for design. The engineers estimate for the scheme design including street lighting was $617,000.

Questions:

- There was currently no fibre along River Road, had there been communication as to when that might be installed so these works did not get ripped up when that would happen?

  Staff always send out a preliminary notice to those kinds of suppliers. They were yet to receive any indication however would follow up.

- Currently more than three to four cars could park on the berm at the end of River Road and often did when there were events on at the A&P Show grounds.

  Staff could not see how six to seven cars could park there however they would investigate it. Staff were trying to find a balance between formalizing parking and being aware of overflow parking that may only occur five times a year.
- Were these options mutually exclusive or could they be staged?

  Staging could be achieved and chose between the parking options to install and when.
- With increased parking on the northern side would we have to think about facilities to safely cross the road?

  There not currently a pedestrian refuge planned as there would not be enough width and the current vehicle numbers.
- Did staff accept the fact that there was demand for parking along River Road?

  Yes, however it did not extend the entire way down River Road.
- What was the driver for doing this work now?

  It was included in the Council's Long Term Plan and had applied for funding from Waka Kotahi in their National Long Term Plan. If the work was not done now the Waka Kotahi funding would be lost.
- Had there been consideration of what would happen if the hospital moved to being 24 hours in the future?

  It was hard to understand what the hospitals overflow parking needs could be in the future. Council did not have the responsibility to provide on street parking for the hospital.

THERE BEING NO FURTHER BUSINESS THE WORKSHOP CONCLUDED AT 3.23PM

DRAFT

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR DECISION

FILE NO and TRIM NO:	RDG-32-115-02 / 230322039767
REPORT TO:	UTILITIES & ROADING COMMITTEE
DATE OF MEETING:	18 April 2023
AUTHOR(S):	Kieran Straw – Civil Project Team Leader Don Young – Senior Engineering Advisor
SUBJECT:	Transport Choices Project 2 – Feasibility of alternative alignments
ENDORSED BY: (for Reports to Council, Committees or Boards)	General Manager / Chief Executive

1. SUMMARY

1.1. The purpose of this report is to communicate the feasibility, and impacts, of alternative alignments for the Rangiora Cycleway Stage 1 (Transport Choices Project 2) between the Passchendaele Path, and Rangiora Town Centre.

1.2. Staff were asked to investigate / reconsider the alternative alignments following debate at the Utilities and Roading Committee meeting on Tuesday 21st March in which PAK'nSave staff presented a deputation in relation to the proximity of the proposed cycleway, and the health and safety concerns associated with this. In March 2023, report (Trim 230131011979) was taken to the Utilities and Roading Committee seeking approval of the Scheme Design for the purposes of consultation. PAK'nSave representatives presented a deputation opposing the proposed cycleway, citing the health and safety concerns associated with this.

1.3. The Committee declined to approve this report and instead requested that staff:

- Arrange for a Road Safety Audit of the proposed Scheme Concept
- Reconsideration of alternative routes in the Southbrook area
- Present a further report to the April Utilities & Roading Committee meeting.

1.4. Therefore, in preparation for this report, staff have sought a Technical Note from a qualified road safety auditor (in lieu of a full Road Safety Audit, due to timeframes) as well as sought feedback from KiwiRail, the owners of the majority of the land under the Rangiora Eastern Link) and the Council 3 Waters Manager.

1.5. The Technical Note has concluded that *it should be possible to establish a transport environment that would provide an acceptable level of safety and amenity for the various user groups in this area*, provided a number of identified matters in the Note are addressed.

1.6. Upon reconsideration of the alternative options, as well as additional correspondence, staff are re-presenting the recommendations from the previous report on this matter, noting that further changes will be carried out on the scheme design in response to the Technical Note, and following feedback from PAK'nSave, and other residents, businesses and stakeholders, and noting that a draft detailed design will be presented to this Committee before finalising..

Attachments:

i. Approved Cycle Network Plan for Rangiora (TRIM 230330044260)
ii. Rangiora Cycleway Scheme Design Drawing set (version 2) (Trim 230216020650[v2])
iii. Alternative Options – Alignment Drawing (TRIM 230330044262)
iv. WSP Technical Note on the proposed alignment (TRIM 230330044268)
v. KiwiRail email (TRIM 230330044271)
vi. Email from the Sparks in relation to use of the proposed Eastern Link Corridor (TRIM 230329043850)
vii. Options Comparison (TRIM 230324041610)
viii. Email re alignment through Waste Water Treatment property (TRIM 230330044269)

2. RECOMMENDATION

THAT the Utilities and Roading Committee

(a) **Receives** Report No. 230322039767.

(b) **Approves** the Scheme Design as per Attachment ii (Railway Rd/Torlesse St/Coronation St/Ellis Rd) and Option Four (section 4.5) of this report for the purposes of consultation.

(c) **Notes** that alternative options to Railway Rd past PAK'nSave have been considered as per Attachment iii), and are commented on in more detail below:

i. Southbrook Road (up to Coronation Street)

ii. Southbrook Road (up to Todds Rd, and using Ellis Road)

iii. Southbrook Road (up to Mitre 10 and along South Brook)

iv. Railway Rd (as originally proposed)

v. Railway Road (utilising the eastern side of the rail corridor)

vi. Eastern Link alignment (between Marsh Rd to Boys Rd)

vii. Eastern Link alignment (between Lineside Rd and Marsh Rd)

(d) **Notes** that a Technical Note from Road Safety Specialists (Attachment iv) has identified that *it should be possible to establish a transport environment that would provide an acceptable level of safety and amenity for the various user groups in this area*, provided a number of identified matters in the Note are addressed.

(e) **Notes** that any option that includes a level crossing, or alignment within the KiwiRail Corridor will need to follow KiwiRail processes, which at the moment they have indicated this could take "*years to complete*." (Attachment v). This is due to staff shortages and a high workload within KiwiRail.

(f) **Notes** that the landowner under the majority of the Rangiora Eastern Link land has advised that they do not support that option (Attachment vi).

(g) **Requests** that staff work collaboratively with PAK'nSave, Foodstuffs South Island and their representatives to address their concerns and endeavour to reach a mutual agreement on safety mitigation measures.

(h) **Notes** that staff will discuss the approved Scheme Design with all other directly impacted residents, businesses and stakeholders (including KiwiRail and Waka Kotahi) to ensure that issues and concerns are carefully considered and taken into account.

(i) **Notes** that feedback from the consultation will be fed into the Detailed Design, and that the Detailed Design will be reported back to the Committee in July 2023.

(j) **Notes** that a full Road Safety Audit will be carried out and the recommendations of that (including any intersection re-configuration) will be discussed fully with PAK'nSave and

other impacted stakeholders, and then be incorporated into the Detailed Design for consideration by the Committee.

(k) **Notes** the scheme design requires the removal of 7 on street car parking spaces, and that the final approval of any parking spaces to be removed will be included within the detailed design report in July 2023.

(l) **Notes** that any parking to be removed as result of the Scheme Design will be consulted directly with the immediate adjacent residents.

(m) **Notes** that the scheme design requires the removal of 12 existing street trees, which are required to be replaced in alternative locations to be agreed with Greenspace, and that final approval of the removal of any street trees will be included within the detailed design report in July 2023.

(n) **Notes** that this project is funded through the "Transport Choices" funding stream (which is still subject to final signing and confirmation), and this requires that all works is complete by June 2024

3. BACKGROUND

3.1. This draft Walking and Cycling Network plan was developed in 2020 collaboratively with a Walking and Cycling Reference Group that included representation from elected members, schools, local business promotion groups, Environment Canterbury, Police, specific interest groups and walking and cycling advocates.

3.2. As part of the development of the Walking and Cycling Network Plan, a report was taken to all of the individual Community Boards in August 2021 seeking approval to consult on the draft Walking & Cycling Network Plan. This report then went on to be approved by Council in October 2021.

3.3. Following this district wide consultation, a further report was taken to the Community Boards and then the Council in October 2022 seeking adoption of the Walking and Cycling Network Plan, and associated Infrastructure Prioritisation Programme. The plan was subsequently adopted by Council.

3.4. In March 2023, report (Trim 230131011979) was taken to the Utilities and Roading Committee seeking approval of the Scheme Design for the purposes of consultation. The Committee declined to approve this report and instead requested that staff:

- Arrange for a Road Safety Audit of the proposed Scheme Concept
- Reconsideration of alternative routes in the Southbrook area
- Present a further report to the April Utilities & Roading Committee meeting.

3.5. Refer to previous report for further background details on the wider project (Trim 230131011979).

3.6. Since the Committee meeting, the staff have carried out the following actions:

3.7. Staff have sought a Technical Note from Road Safety Specialists (Attachment iv). This was necessary as there is insufficient time to prepare a full Road Safety Audit. The technical Note concludes as follows:

Having reviewed the documents provided it is considered that the Shared Use Path could be established to provide an appropriate level of amenity and safety for road users in the area if the following are considered:

• Confirm KiwiRail requirements for the level rail crossing signs/ markings/ controls as this will confirm spatial requirements for these devices and be integrated into the detailed design

• Reconfigure the intersection layout of Railway Road/ Station Road to achieve the following: – lower operating speed at the intersection

– facilitate the "right turn" of semi-trailer from Station Road to Railway Road

– assist with potential spatial requirements from KiwiRail for rail level crossing related to signs and traffic control devices

– assist with achieving better intervisibility between left turners southbound on Railway Road (crossing the rail level crossing) and southbound shared path users. This ensures a left turning (southbound) vehicle (particularly HCV) are squared up to the level rail crossing as much as possible, so the driver gets the best sightlines possible to the shared path

• Providing a coloured buffer surface (e.g., 300mm wide) on the shared path between Station Road and the proposed Raised Safety Platform (pedestrian crossing facility)

• Marking an edgeline to demarcate the extent of the 2.5m wide on-street parking provided for Pak'nSave operators to provide guidance to users of where their vehicle should be postioned while parked

• Reviewing HCV tracking into the on-street parking provided for Pak'nSave operators to ensure these vehicles can park parallel to the traffic lane, without "overhang" to the traffic lane (this will determine whether the entry to the parking is adequate or needs to be eased)

• Move the location of the proposed pedestrian facility (on raised safety platform) further north of the Pak'nSave exit to enable left turning vehicles (exiting Pak'nSave) to "square up" to the crossing area to ensure the driver gets the best visibility of pedestrians possible. This can be confirmed through vehicle tracking at detailed design.

• Attention to detail of the operating requirements for the Recreational Vehicle Effluent Disposal site, the adjacent shared path and integration with intersection reconfiguration. This can be clarified through detailed design.

• Consideration of Streetlighting requirements

• Consideration of shared path "Tie-In" north of Pak'nSave

Whilst there are several points raised in this report this is not unexpected at the earlier stage of project development. WDC has received feedback from some stakeholders and ongoing engagement will ensure various road user perspectives are considered and incorporated into the detailed design (which would be safety audited).
On that basis, it should be possible to establish a transport environment that would provide an acceptable level of safety and amenity for the various user groups in this area.

3.8. Staff have also marked the proposed kerb, and footpath alignment on the ground on-site, and delivery trucks have been observed to manoeuvre without concern of over-running the proposed footpath. As yet this has not been discussed with PAK'nSave or delivery companies, but this will be done at the next stage if approved.

3.9. Staff have also sought feedback from KiwiRail on options for new crossings, and/ or land occupancy, and they have responded as follows (Attachment v):

KiwiRail is not adverse to such Projects –

- *However to satisfy all KiwiRail and third party operational and Safety concerns.*
  - *We do have a definite process we use as a mechanism to manage the approval Process.*
  - *We have distributed this third party Process to you.*

Time line of process

- *In this current climate it is near impossible for us to offer up a time frame for the process, as it involves a number of our Engineering staff.*
    - *We could be talking years to complete – depending on what design or improvements are required.*
- *As mentioned, KiwiRail have an extra ordinary work load on at the moment.*
- *This along with staffing shortage issues, as shared with a number of sectors of Industry.*
- *Our staff are currently prioritised to our highest priority Projects – ie Major Projects which are currently in flight, recovery from Cyclone Gabrielle and our RNIP work bank – "'Rail Network Improvement Programme".*
- *Added to this a high number of Agencies and Community Projects who have received "Shovel ready Funding" or similar, who are also applying for similar projects to be carried out – placing additional strain on Professional teams.*

Comments quoted - as raised by your councillors:

- *Christchurch do have cycleways and crossings – which have been installed and still being installed after following the process.*

3.10. Staff have also sought comment from the landowner of the majority of land affected by the Rangiora Eastern Link (Attachment vi) and they respond as follows:

In response to your enquiry, as much as we support the concept of cycleways, our view is that we do not believe establishing a cycleway through our farm is the best option. We make the following comments;

- *The construction and use of the cycleway would be extremely disruptive to our farming operation.*
- *Cyclists going through the middle of our farm poses health and safety risks to our animals being spooked, associated risks to our staff, and risks to the public using the cycleway in case animals venture onto the cycle way.*
- *Our irrigators and farm machinery would also need to cross over the cycle way requiring major infrastructure changes and potential loss of farm productivity.*
- *Assuming our land is successfully re-zoned as requested in our submission to WDC, subdivision works will include earthworks of which the quantities/levels are not yet established. Any new cycleway through the farm land will be destroyed during subdivision works.*
- *The final layout of the subdivision is not yet known. Being constrained by a cycleway through the land will negatively impact the subdivision design process.*
- *It makes much more sense to include the cycle way as part of the proposed eastern link road when that is constructed, rather than duplicate costs of doing the job twice.*

3.11. Staff also sought feedback from the 3 Waters Manager about the use of the wastewater Treatment plant land for a cycleway and his response is attached (Attachment viii.)

4. ISSUES AND OPTIONS

4.1. Staff have re-considered the several options to get cyclists past Southbrook. For each of these options, staff have considered the following:

- Traffic Volumes
- Vehicle Entrance Conflicts
- Intersection Conflicts & Road Crossings
- Rail Corridor
- Parking Impacts
- Connectivity
- Programme Risk
- Financial Risk
- Reputational Risk

Included as attachment vii. is a summary of these options, which demonstrates the strengths, and weaknesses of each option. As always, these processes are somewhat subjective, but nevertheless the scoring would indicate that Option Four is the best scoring, with Option 5 not far behind.

4.2. Option One – Southbrook Road, then Coronation St

This option sought to link the Passchendaele Path with the proposed Rangiora Cycleway at the Southbrook Road / Coronation Street intersection, by traveling along Lineside and Southbrook Roads. To achieve this, cyclists would utilise either a shared use path, or a separated bi-directional path on the western side of Southbrook Road between the Passchendaele Path and Coronation Street.

This option provides the best connectivity from the Passchendaele path as it is very direct, however it is not recommended for the following reasons:

- It would require users to pass through 19 commercial vehicle entrances on both Lineside Road and Southbrook Road, many of which have high number of commercial vehicles (for example Rangiora Landscapes, and Weston Stock Feed), or a high volume of vehicle movements (BP, McDonalds).
- In addition to the commercial vehicle entrances, users would be required to navigate the Flaxton Road intersection (AADT 7,462), and the Todds Road intersection (AADT 1,362). Both of these roads have a high number of heavy vehicles (590 and 227 respectively). The Flaxton Rd intersection in particular would create a major point of conflict between vehicles and cyclists, which may require major restrictions on vehicle turning movements to make it safe for a cycle path, which in turn would create significant additional delays for vehicles. A third intersection in the form of the entrance to Mitre 10 is also located along this route.
- This option maximises the exposure to cyclists that would be adjacent to Southbrook Road which has 24,463 vehicles per day. Of these, there are approximately 1,200 heavy vehicle movements each day.
- This option would occupy additional space on Southbrook Rd up to Coronation St that is currently available for cars and parking, and so there would be further loss of vehicle capacity and parking spaces.

Note that Southbrook Road remains on the Cycle Network Plan as a “Grade 3” route suitable for confident, on-road cyclists only.

4.3. Option Two – Southbrook Road, then Ellis Road

This option sought to link the Passchendaele Path with the proposed Rangiora Cycleway at the western end of Coronation Street by using the unformed length of Ellis Road.

To achieve this, cyclists would utilise either a shared use path, or a separated bi-directional path on the western side of Southbrook Road between the Passchendaele Path and Todds Road, at which point cyclists would be directed into Ellis Road, and behind the McAlpines Mitre 10 site.

This option provides good connectivity from the Passchendaele path as it is very direct, however it is not recommended for the following reasons:

- It would require users to pass through 11 commercial vehicle entrances on Lineside Road, many of which have high number of commercial vehicles (for example Rangiora Landscapes), or a high volume of vehicle movements (BP, McDonalds).
- In addition to the commercial vehicle entrances, users would be required to navigate the Flaxton Road intersection, and the Todds Road intersection (AADT of 7462 and 1,362 respectively). Both of these roads have a high number of heavy vehicles (590 and 227 respectively). This would have the same issue as above.
- The formed length of Ellis Road, west of Todds Road, is currently used by McAlpines Timber Ltd as access between yards. This length of road is frequently used by trucks, heavy machinery and forklifts and is inappropriate for the installation of a cycle lane in it's current form. It is estimated that 20-35 truck movements and approx. 200 light vehicles use this road. In many ways, Ellis Road is treated as an internal accessway by McAlpines over many years of historical use, noting that as the road is a dead-end, effectively the only usage is by McAlpines staff, contractors and customers. Changes to the usage sufficient to provide a safe passage for cyclists would have a major impact on that business.
- Use of Ellis Road would still require cyclists to cross Flaxton Road with the associated issues noted above.

4.4. Option Three – Southbrook Rd and along Southbrook Stream through Mitre 10

This option was originally considered but was not supported by McAlpines Mitre 10. The route would need to pass through their property, and they declined approval for this to occur.

In addition, this option still requires crossing of 11 commercial entrances, and Flaxton Rd, Todds / Ellis, and the Mitre 10/ PAK'nSave intersections, with the associated issues noted above.

4.5. Option Four – Railway Road past PAK'nSave (Previously recommended option)

This option extends the current shared path on the western side of Lineside Road that currently ends at the Railway Road intersection.

This option requires that the off-road shared path is extended on the eastern side of Railway Road, past 5 commercial vehicle entrances (one of which is not currently used).

This option does **not** directly conflict with the vehicle entrance for PAK'nSave's 20 – 30 delivery vehicles each day, although there are turning movements from the opposite side of Railway Rd towards the proposed path.

Railway Road has an AADT of 875 vehicles per day, 97 of which are heavy vehicles.

The shared path also requires cyclists to pass through the Marsh Road intersection. This intersection has an AADT of 216 vehicles a day (24 of these are heavy vehicles). It is recognised that this intersection poses a significant risk to motorists crossing the adjacent level crossing, and the addition of the cycleway further increases the complexities that a motorist is required to consider.

However staff are currently working with KiwiRail to improve this intersection and the interaction with the level crossing.

To ensure that the cycle way does not further complicate the intersection, path users will be required to give way to motorists using Marsh Road. Due to the low traffic volumes, the likelihood of conflict at this intersection is considered low.

The adjacent rail line also poses a risk to path users. Staff are working with KiwiRail to confirm the required off-sets and separation (fencing) requirements to prevent public from entering the rail corridor. The proposed cycleway does not cross the railway line.

This option is not as direct to the Rangiora Town Centre as options one and two, however it does provide good connectivity to the Rangiora New Life, and Southbrook Schools. It should also be noted that students from these schools are likely to be riding from the northern sections of the cycleway, rather than through this industrial length.

This option also provides a crucial pedestrian link through this industrial area, that otherwise requires pedestrians to walk on the road carriageway in direct conflict with the vehicles on Railway Road, including those turning out of PAK'nSave and Station Road.

It is this option that was included in the Cycleway Network Plan for district wide consultation, which was subsequently supported by the community, the community board, and approved by Council in October 2022.

Upon completion of re-consideration of all options available, this option remains the recommended option.

Staff have also engaged WSP to undertake an independent safety review of this length of the proposed cycleway which is included as attachment iii. of this report.

4.6. Option Five – Railway Road, utilising the eastern side of the Rail Corridor between Marsh Rd and Dunlops Rd

This option was suggested during the March Utilities & Roading Committee. It is essentially "Option Three" however the path crosses the Marsh Road level crossing and utilises the rail corridor on the eastern side of the railway line past PAK'nSave.

This option is not recommended for the following reasons:

- Path users are required to cross the level crossing at both Marsh Road, and Dunlop's Road. Despite the low traffic volumes of just 216 vehicles each day, there has been two recorded accidents at this level crossing involving collision with trains at this crossing over the past 10 years. KiwiRail have indicted that, while they are open to considering the concept, the timeframes for that consideration will mean that the project cannot be completed in the required timeframe, and there is no guarantee on their response once they do consider it.
- Although this alignment provides increased separation from the trucks using Railway Rd to access PAK'nSave, it does not alter the conflict location for trucks turning right out of Station Road into Railway Road or reduce the exposure to the heavy vehicles that use the south end of Railway Rd, or the Marsh Road crossing.
- This option increases the cost of the alignment significantly, by requiring the construction of a new bridge within the rail corridor over Southbrook Stream for the proposed cycleway (instead of using the existing twin Armco culverts on Railway Rd.

4.7. Option Six – Cycleway within the Eastern Link Designation through Sparks Land

The Eastern Link Cycleway is currently approved on the cycleway network plan as a long-term future link between Passchendaele path and eastern Rangiora. This link is intended to compliment the other approved cycle network connections within the network plan rather than replace them.

For the purposes of this option as a short term option, staff have assumed the development of the cycleway only between Marsh Road, and Boys Rd as a means to get cyclists past

PAK'nSave. This option would also require a cycle link along firstly Boys Rd, and secondly South Belt so that path users are connected to existing facilities on Percival Street.

It is noted that the Council currently has no rights to this land. While it has applied for designations under the Proposed District Plan, these will not be considered and formalised for at least another 12-18 months. Therefore any use of this route would be as part of a willing landowner arrangement.

Consideration of this route to replace the Railway Road link is not recommended for the following reasons:

- The property owners have provided feedback about this option. Refer to attachment iv. for the property owner's email. Their concerns include the disruption to their farming operation, the health and safety risks to our animals being spooked, associated risks to our staff, and risks to the public, the major infrastructure changes and potential loss of farm productivity, and concerns regarding future usage.

- This route has poor connectivity to the Rangiora Town Centre, and the other key destinations along the currently proposed route (Southbrook Park, New Life School, Southbrook School, Southbrook businesses)

- Path users are required to cross the level crossing at both Marsh Road and again at Boys Rd, with the same comments about KiwiRail approval timeframes.

4.8. Option Seven – Cycleway within the Eastern Link Designation through the Wastewater Treatment Plant area, and along the railway corridor alongside Railway Road.

This option would require northbound cyclists to cross the state highway near Morrisons cars, and then either cross the railway at a new crossing point near there, or retrace southwards to cross at the railway line at Lineside Rd. This is because it would not be appropriate for cyclists to cross the State Highway near the railway line. At this point, the route is constructed through land owned by the Council's Water Unit through to Marsh Road, before travelling alongside Marsh Rd to the rail corridor identified in Option Four. The shared-use path would then continue along the eastern side of the Rail Corridor, connecting back in to Railway Rd at the Dunlops Road intersection.

This option is not recommended for the following reasons:

- The route is indirect, requiring path users to take a much longer route to utilise the existing level crossing at Lineside Road.

- It passes through the Water Unit yard, which is an operating wastewater plant, with significant hazards. Fencing off the path to separate out the hazards will significantly impact on the Water Units operations. Also travelling through the wastewater treatment plant is not ideal from an amenity perspective.

- It requires the construction of two new bridge structures to cross the South Brook (one in the water unit yard, and the other within the rail corridor)

- It requires path users to cross two level crossings and construct a length of path within KiwiRail land. The process to complete this will result in a delayed programme, and unnecessary expose to risks associated with the rail corridor.

- It locates a short length of path adjacent to the 100km/hr entrance to Rangiora at the "S" bend adjacent to the railway crossing on Lineside Road.

4.9. Recommended Option

Options one, two, and three are considered by staff to be unsafe from a user safety perspective. Staff would not recommend these options for the purposes of encouraging "interested but concerned" cyclists on these routes.

Options five, six and seven are considered to be very difficult to achieve in the necessary time frame in terms of obtaining KiwiRail approval. They have indicated a very long timeframe, and there would be no guarantee at the end of this process.

Option six is not supported by the landowner, who would need to be a willing participant in these discussions. Note that option six is already on the Network Plan for future works. To complete this now in lieu of Railway Road would provide poor connectivity with key destinations, and the Rangiora Town Centre, and would not able to be completed in the timeframes, or budgets that we currently have available.

Therefore, Option four remains the staffs recommended option.

4.10. Implication for Community Wellbeing

There are implications on community wellbeing by the issues and options that are the subject matter of this report.

The addition of walking and cycling infrastructure encourages a greater uptake of walking and cycling, both for commuters and recreation. An uptake in walking and cycling also contributes to improved health and wellbeing of members within the community. Further to this, including infrastructure which caters for a wide range of skill levels encourages less confident cyclists, who may have otherwise chosen to travel via motor vehicle, to use the provided facilities.

The project will include a significant landscaping allowance to further enhance the user experience, amenity, environmental aspects of this project.

4.11. The Management Team has reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are not likely to be affected by, or have an interest in the subject matter of this report.

5.2. Groups and Organisations

There are groups and organisations likely to be affected by, or to have an interest in the subject matter of this report.

PAK'nSave

PAK'nSave spoke at a deputation at both the previous Community Board meeting, and the subsequent Utilities & Roading Meeting. A full list of their concerns can also be found in the previous report (Trim 230131011979).

The revised design mitigates PAK'nSave's primary concerns regarding conflicts between Trucks and path users, however PAK'nSave remain fundamentally opposed to the installation of a cycleway on Railway Road.

Walking and Cycling Reference Group

The Walking and Cycling reference group has been extensively involved with the development of the walking and cycling network plan. Any potential revision of the approved network plan would need to be taken back to the Walking and Cycling Reference Group, and subsequently taken back the wider community for further consultation.

Adjacent residents and businesses

Depending on the option chosen, neighbouring residents and businesses would also be affected parties that required consultation.

Other affected parties

Depending on the option chosen, KiwiRail, Waka Kotahi, McAlpines, and Sparks would also be affected parties that required consultation.

5.3. **Wider Community**

The wider community is likely to be affected by, or to have an interest in the subject matter of this report.

Specifically, Council had carried out an extensive, district-wide consultation process seeking feedback on the proposed Walking and Cycling Network Plan, and prioritisation of the routes. There was significant support for the plan from the community who indicated strongly that the Council should invest in providing walking and cycling facilities.

To significantly alter the Walking and Cycling Network Plan at this stage will require Council to engage with the community again. This would need to clearly outline why changes are being proposed to the plan given the level of support from the community for the plan and that it was formally adopted by Council. There is a risk to Council that the public perceive that their feedback had been disregarded and that they have little involvement or influence on decision making.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. **Financial Implications**

There are financial implications of the decisions sought by this report.

The Transport Choices funding that applies to this route was applied for on the basis that the cycleway would be constructed along the route of the approved Cycle Network Plan. A significant change to the cycleway route would require a re-submission of the application, which risks the project losing funding, and / or being significantly delayed.

The current estimate for this project (assuming the alignment along Railway Road as recommended) is $1,416,000. However, this will change to some degree depending on any additional works required as part of the Technical Note or Road Safety Audit, or as a response to the stakeholder feedback.

The Transport Choices funding of $1,416,000 signaled for this project has been based on the cost estimate for the project. The funding still needs to be approved, and will not be confirmed until the Council applies for detailed design approval.

Staff will be reviewing the cost estimates associated with all Transport Choice Cycleway Projects, and an updated cost estimate will be provided when the detailed design is presented for approval.

Due to the short timeframe, estimates are not available for the alternative options.

6.2. **Sustainability and Climate Change Impacts**

The recommendations in this report do have sustainability and/or climate change impacts.

Creating a safe and accessible walking and cycling network, which comes with improving infrastructure, increases the uptake of these activities for both recreational and commuter users. This results in a subsequent decrease in the number of people using single occupancy vehicles, particularly for shorter trips. This comes with many benefits, including health and the reduction of greenhouse gas emissions.

6.3 **Risk Management**

There are risks arising from the adoption/implementation of the recommendations in this report.

- Delays in getting KiwiRail approvals
- Delays in consulting affected businesses on other routes
- Delays in consulting wider public
- Risks of alternative routes

There is a risk that the funding will be reduced or removed. This will be managed by delaying key commitments until after the funding is confirmed. However, we need to proceed in the interim in order to meet the very tight timeframes. Delays associated with consulting to update the Cycle Network Plan to approve an alternative alignment will increase the likelihood that funding will be withdrawn.

Although an initial information notice has been distributed to all residents along the length of the route, there remains a risk that residents may not favour the inclusion of a facility along their street. To minimise this risk, staff will begin engaging with residents during the design phase of facilities. This will show residents exactly what is proposed along the road corridor and enable them to notify staff early on if there are aspects which they are not in favour of. This feedback will be fed directly into the design process, and reported back to the Utilities and Roading Committee in May 2023.

There are risks that accidents will occur along the proposed cycleway, due to the increased use by cyclists, and potential for conflicts with vehicles. This needs to be carefully managed through a mixture of good design, signage and education, which should minimise these risks. However, a residual risk will remain, and this needs to be recognised.

There is a risk that objections to the location or the design of the cycleway will delay the project to the point that it cannot be constructed in time. This needs to be managed by open communication with affected stakeholders, seeking to mitigate their issues. However even with these actions, this remains a risk.

6.3 **Health and Safety**

There are health and safety risks arising from the adoption/implementation of the recommendations in this report.

Staff have engaged WSP to prepare an Independent Technical Note on the portion of the cycleway that runs along Railway Road (Recommended Option three). This provides an independent review of the of this design, provides comment on any foreseeable safety issues, and provides a detailed response in regards to the mitigation measures required for those issues. This Technical Note is included as attachment iv. of this report.

KiwiRail have also been approached for comment on the current proposed design. KiwiRail are unable to give a formal approval of the design until a Level Crossing Safety Impact Assessment is completed. This is a time consuming process that is currently underway. Kiwirail rail however have provided an initial response, which is included as attachment v. of this report.

The Scheme Design that has previously been recommended is yet to go through an independent Road Safety Audit. Staff will send these drawings for auditing upon approval of this report, and in conjunction with the consultation phase.

Contractors engaged for the works will be required to be SiteWise registered, and complete Site Specific Safety Plans prior to commencing works on site.

7. CONTEXT

7.1. Consistency with Policy

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. Authorising Legislation

Local Government Act 2002

7.3. Consistency with Community Outcomes

The Council's community outcomes are relevant to the actions arising from recommendations in this report.

Public spaces and facilities are plentiful, accessible and high quality, and reflect cultural identity.

- There are wide-ranging opportunities for people to enjoy the outdoors.
- The accessibility of community and recreation facilities meets the changing needs of our community.

Core utility services are sustainable, resilient, affordable, and provided in a timely manner.

- Climate change considerations are incorporated into all infrastructure decision-making processes.

Transport is accessible, convenient, reliable, and sustainable.

- The standard of our District's transportation system is keeping pace with increasing traffic numbers.
- Communities in our District are well linked with each other and Christchurch is readily accessible by a range of transport modes.

7.4. Authorising Delegations

The Community Boards are responsible for considering any matters of interest or concern within their ward area and making a recommendation to Council.

The Utilities and Roading Committee have the Delegations to accept this report, and approve the Scheme Design of this cycleway.

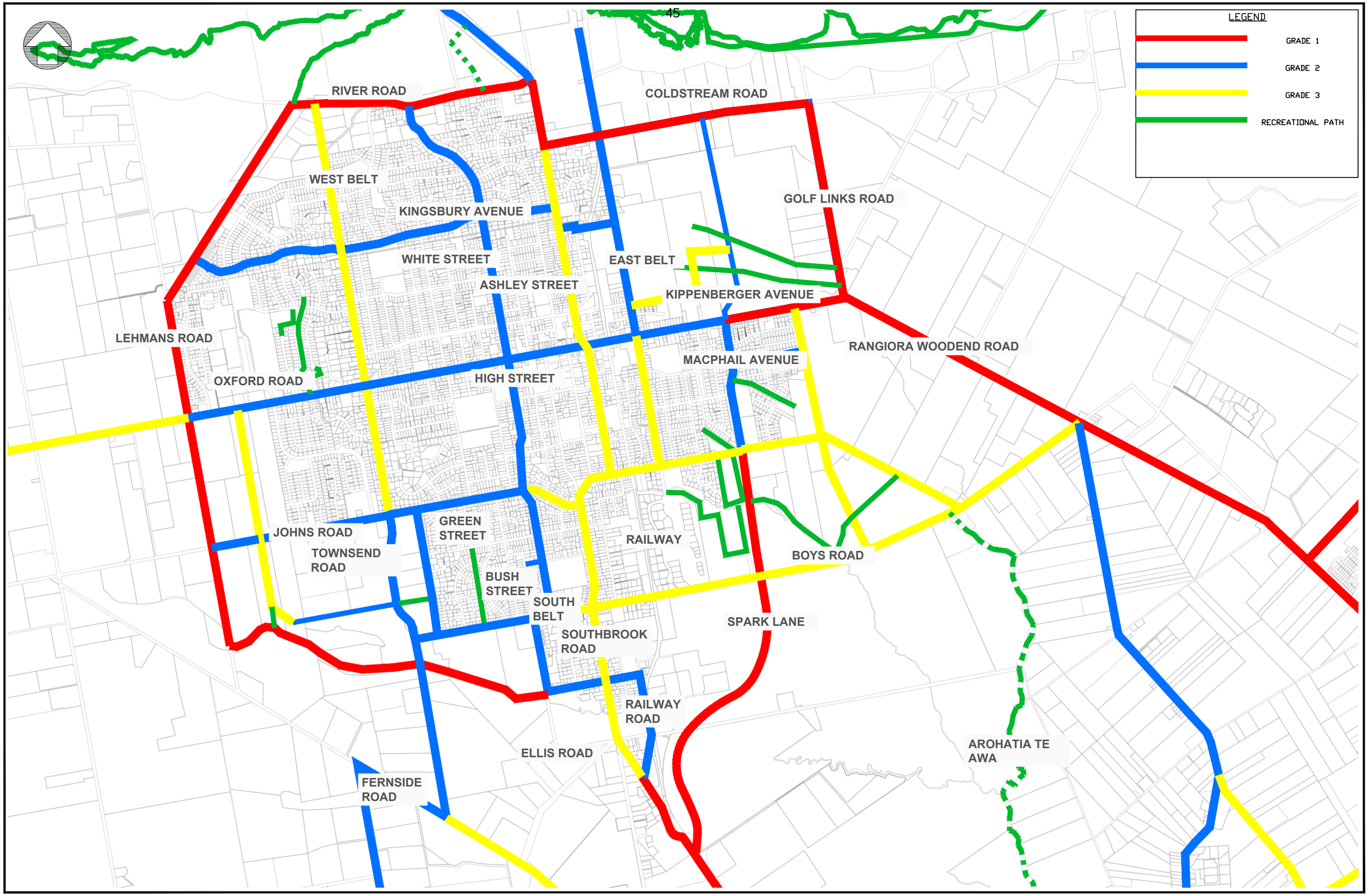
Print Out No. 1

Recommended Walking and Cycling Network Plan

These maps show the overall district Walking and Cycling Network Plan and includes all existing facilities, as well as the required infrastructure to complete the network.

Each route is graded into three categories, described in the table below:

	Treatment Options **Urban Areas**	Treatment Options **Rural Areas**
Grade 1 (Family/Low Confidence) This grade is the highest level of comfort, and is suitable to Novice users. There is little conflict with motor vehcles along the route. These are typically "arterial" cycle routes, and are installed as critical links between our main towns.	- Generally not applicable to retrofit within urban streets	- 2.5m or greater (3.0m desirable) shared path with an asphalt surface
Grade 2 (Medium Confidence) This grade is suitable for users with basic competence skills. Users may be riding on the road, adjacent to live traffic, although there will additional measures in place to protect the vulnerable users or they will be riding on an off-road facility, which may have moreconflicts with motor vehicles (e.g., driveways) than a Grade 1 facility.	- Separated cycle path (off-road) - Neighbourhood Greenways - On-road cycle lane with traffic buffers	- Unsealed shared path (less than 2.5m wide)
Grade 3 (High Confidence) This grade is suitable for users with advanced skills and confidence to mix with traffic.	- On-road cycle lanes	- Sealed shoulder widening
Recreational Trails These trails are aimed at leisure users, and may be considered an "off-road" trail (i.e. suitable for mountain biking)	Trails shown in the network plan are existing recreational trails only. Potential recreation trails are not included within this programme.	



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B	FOR COUNCIL	AMC	KS	---	AUG 2022

SURVEYED			PROJECT No PD001583
DRAWN	MB		CON No
DRAWING CHKD			SCALE (A3) NOT TO SCALE
DESIGNED			DATUM ORIGIN
DESIGNED CHKD			HORIZONTAL NZTM GD2000
APPROVED			VERTICAL

WAIMAKARIRI DISTRICT COUNCIL

PROJECT

WALKING AND CYCLING NETWORK PLAN

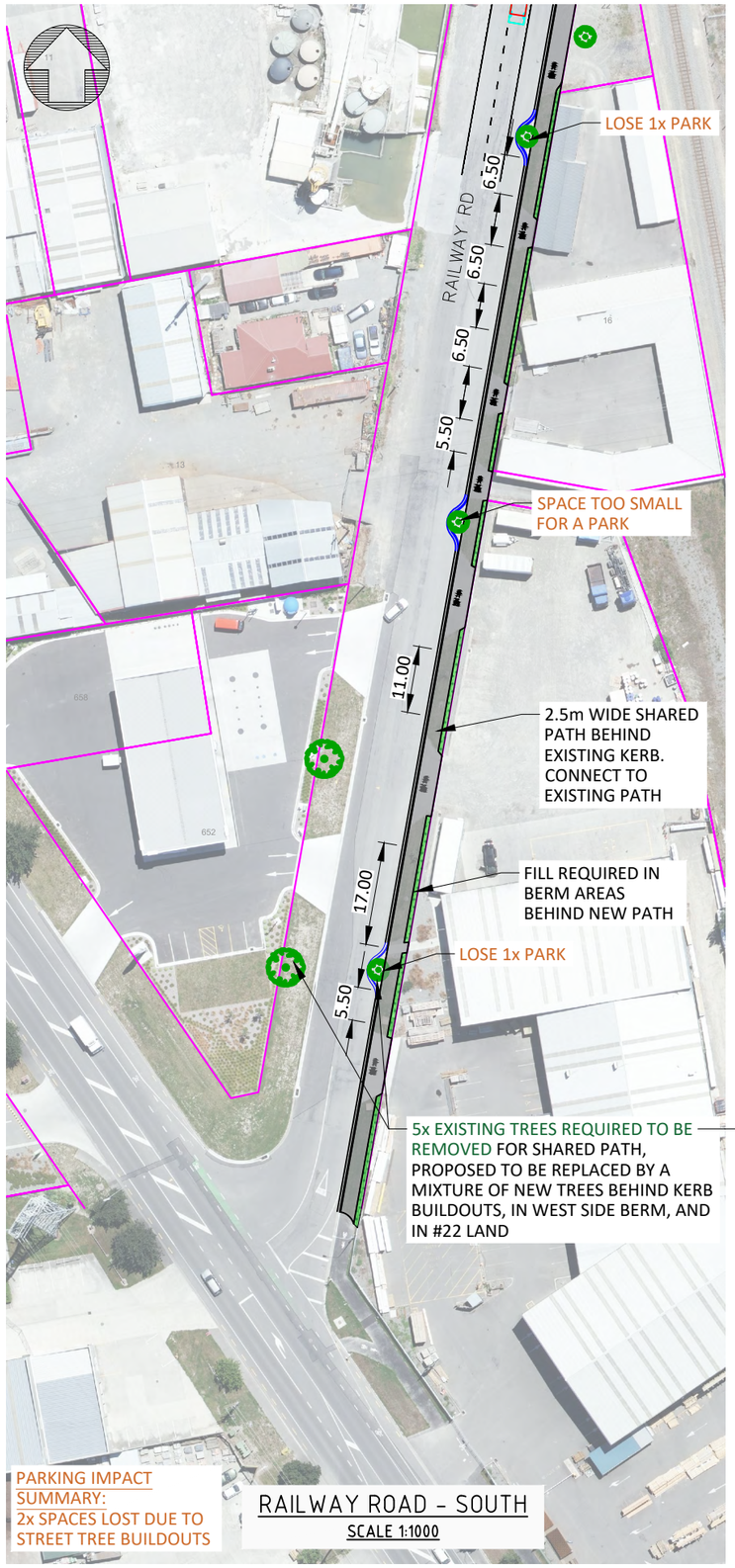
SHEET TITLE

RANGIORA
(RECOMMENDED NETWORK PLAN)

FOR INFORMATION
NOT FOR CONSTRUCTION

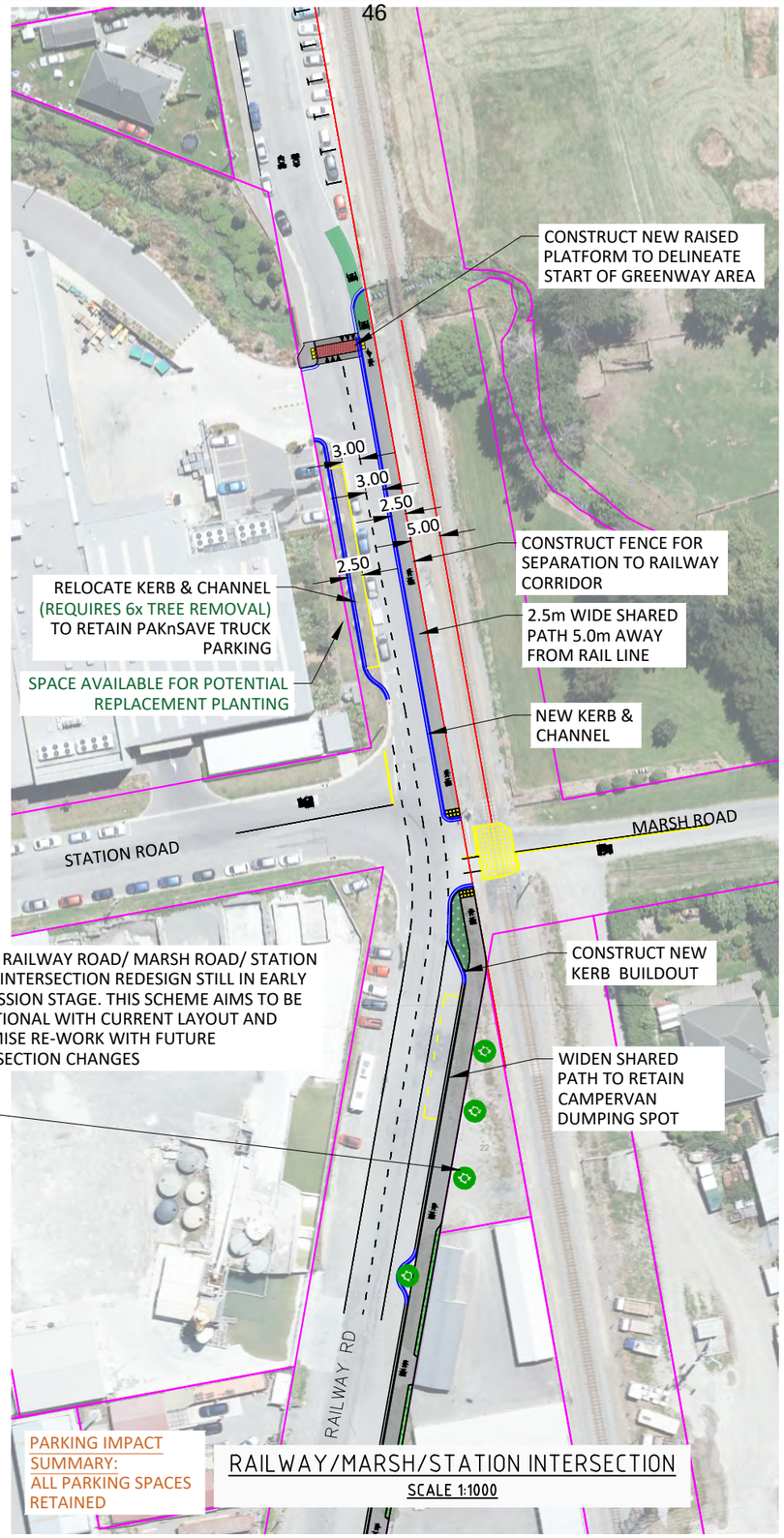
DRAWING	REVISION
4296	
SHEET 03	B

PLOT DATE: 17/08/2022 FILE: S:\PDU\PDU JOBS\PD001500-1599\PD001583 WALKING & CYCLING PROGRAMME 2019-2020\13 - CYCLEWAY NETWORK GIS\00 - GIS DATA\CAD EXPORTS OF CYCLEWAY NETWORK PLAN\NETWORK PLAN\CYCLE NETWORK PLAN - 09-07-21_RECOVER.DWG



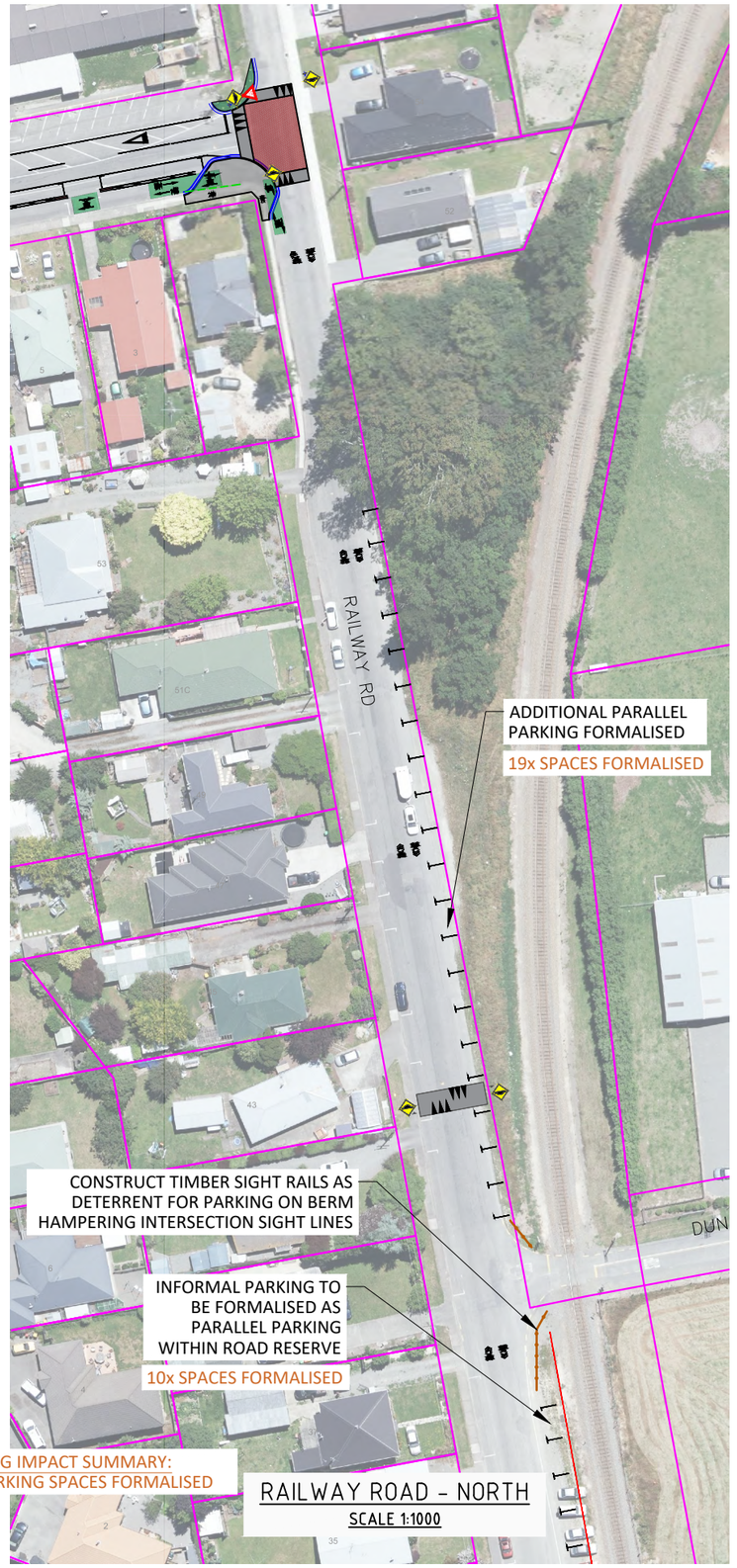
RAILWAY ROAD – SOUTH

SCALE 1:1000



RAILWAY/MARSH/STATION INTERSECTION

SCALE 1:1000



RAILWAY ROAD – NORTH

SCALE 1:1000

REV	REVISION DETAILS	DRN	CHK	APP	DATE
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SURVEYED	---	---	PROJECT No
DRAWN	AK	16/02/2023	CON No 22/50
DRAWING CHKD	---	---	SCALE (A3) NTS
DESIGNED	---	---	DATUM ORIGIN
DESIGNED CHKD	---	---	HORIZONTAL NZTM GD2000
APPROVED	---	---	VERTICAL

WAIMAKARIRI DISTRICT COUNCIL

PROJECT

RANGIORA TOWN CYCLEWAY

SHEET TITLE

RAILWAY ROAD
SCHEME DESIGN

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWING 4354

SHEET	REVISION
1	A

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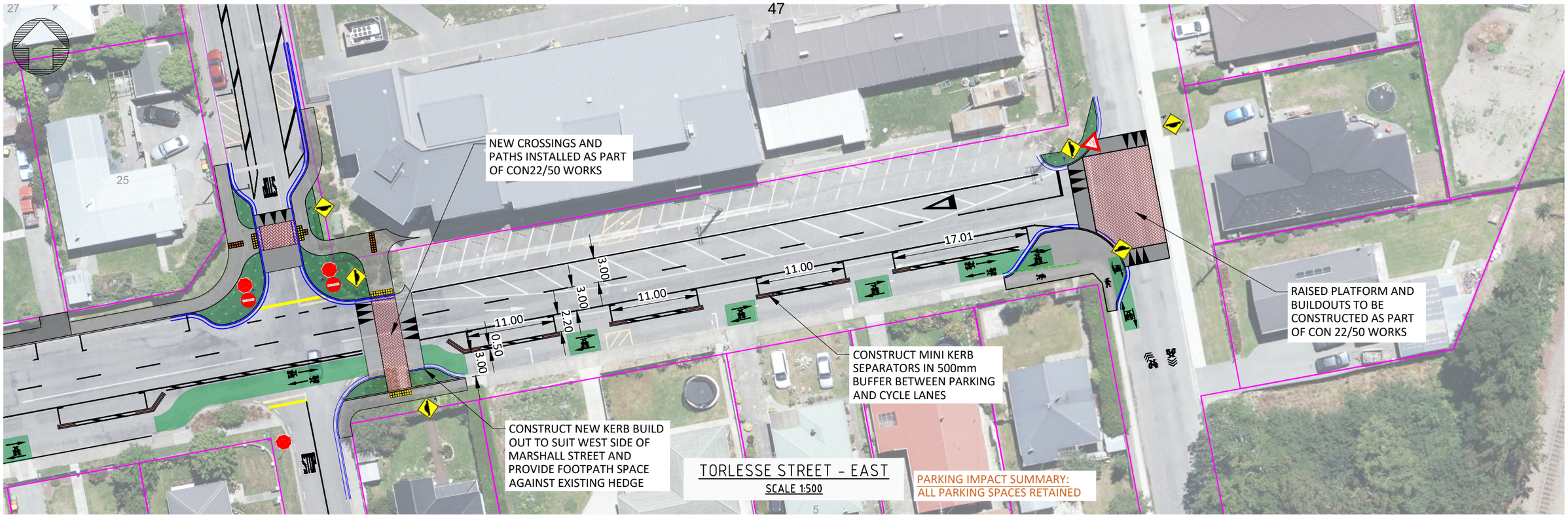
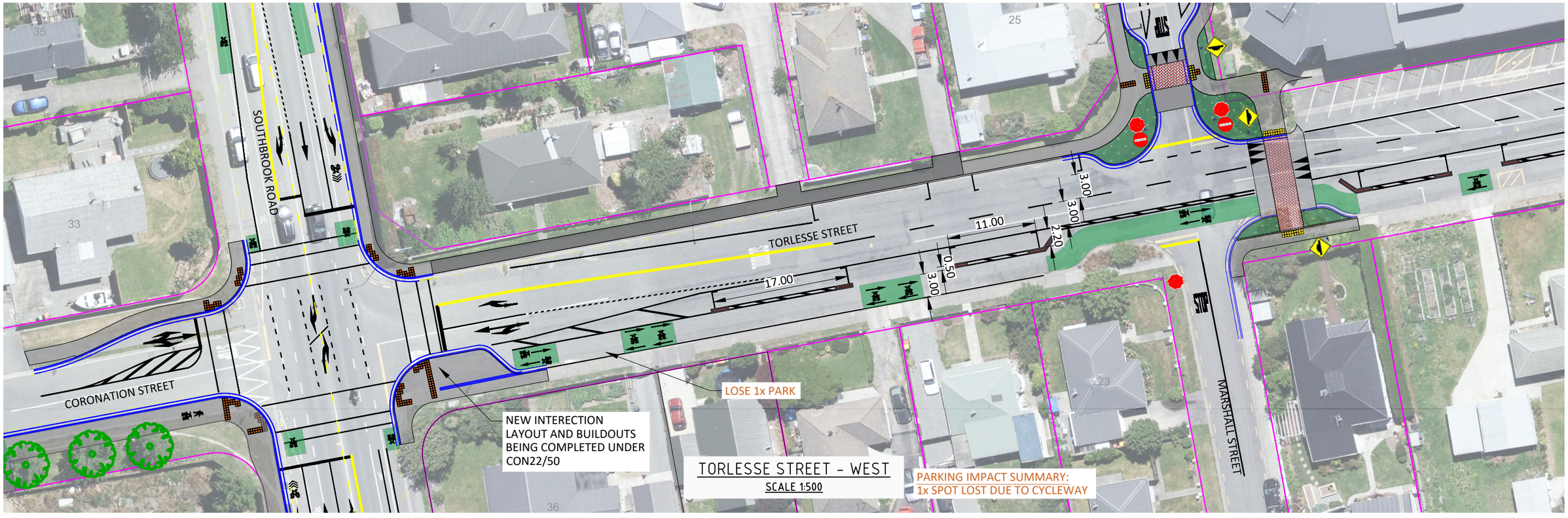


TORLESSE STREET - EAST

SCALE 1:500

PARKING IMPACT SUMMARY:
ALL PARKING SPACES RETAINED



TORLESSE STREET - WEST

SCALE 1:500

PARKING IMPACT SUMMARY:
1x SPOT LOST DUE TO CYCLEWAY

REV	REVISION DETAILS	DRN	CHK	APP	DATE
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SURVEYED	---	---	PROJECT No
DRAWN	AK	17/02/2023	CON No 22/50
DRAWING CHKD	---	---	SCALE (A3) 1:500
DESIGNED	---	---	DATUM ORIGIN
DESIGNED CHKD	---	---	HORIZONTAL NZTM GD2000
APPROVED	---	---	VERTICAL

WAIMAKARIRI DISTRICT COUNCIL

PROJECT: RANGIORA TOWN CYCLEWAY

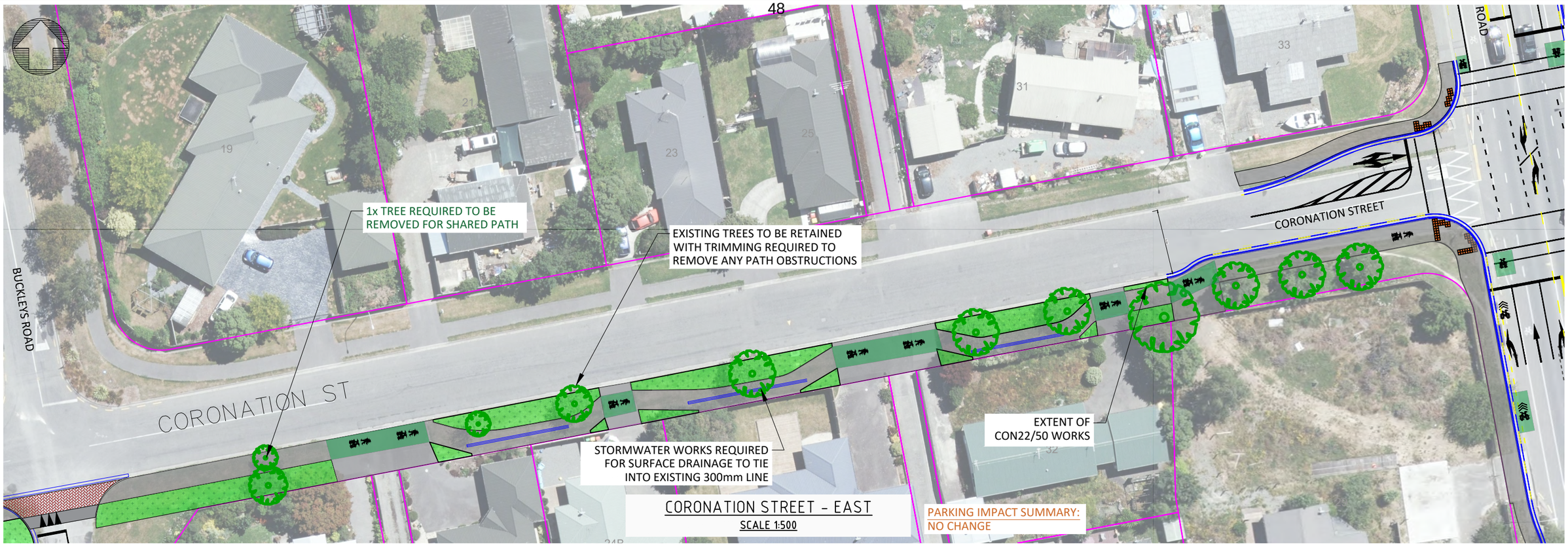
SHEET TITLE: TORLESSE STREET

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWING 4354

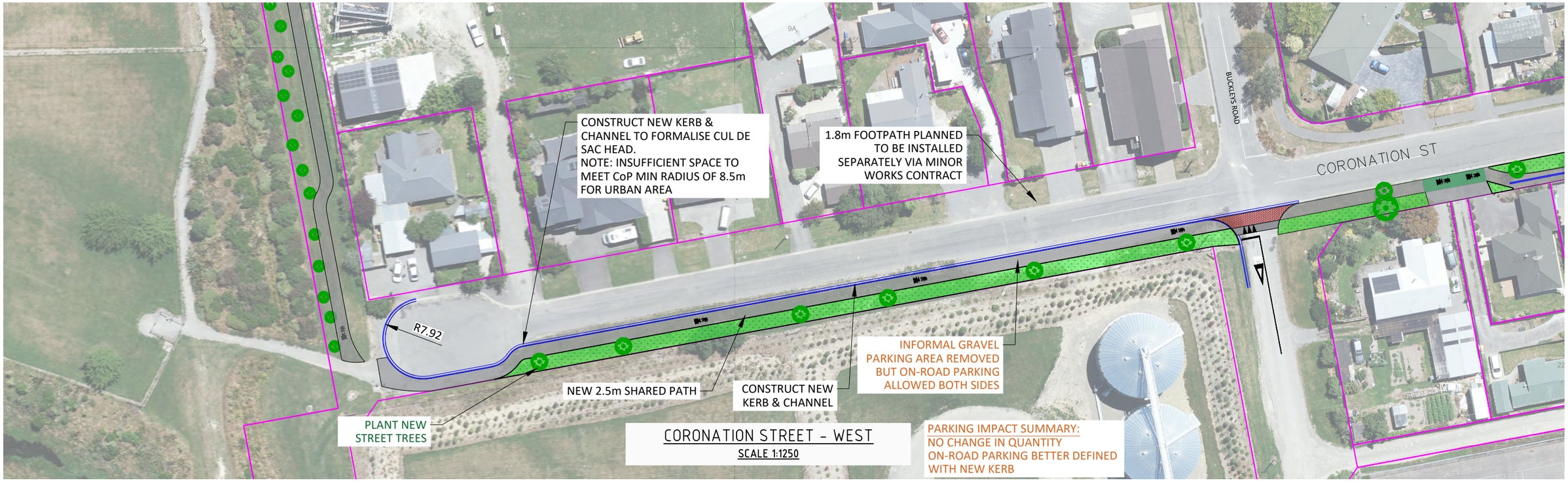
SHEET 2 | REVISION A

PLOT DATE: 10/03/2023 FILE: C:\USERS\AARONK\DOCUMENTS\LOCAL CAD FILES\SOUTHBROOK TORLESSE\SOUTHBROOK DETAILED DESIGN - WORKING DWG - CYCLEWAY PLAN.DWG



CORONATION STREET – EAST
SCALE 1:500

PARKING IMPACT SUMMARY:
NO CHANGE



CORONATION STREET – WEST
SCALE 1:1250

PARKING IMPACT SUMMARY:
NO CHANGE IN QUANTITY
ON-ROAD PARKING BETTER DEFINED WITH NEW KERB

REV	REVISION DETAILS	DRN	CHK	APP	DATE
A	SCHEME DESIGN	AK	---	---	16/02/2023

SURVEYED	---	---	PROJECT No
DRAWN	AK	16/02/2023	CON No 22/50
DRAWING CHKD	---	---	SCALE (A3) NTS
DESIGNED	---	---	DATUM ORIGIN
DESIGNED CHKD	---	---	HORIZONTAL NZTM GD2000
APPROVED	---	---	VERTICAL

WAIMAKARIRI DISTRICT COUNCIL

PROJECT
RANGIORA TOWN CYCLEWAY

SHEET TITLE
CORONATION STREET

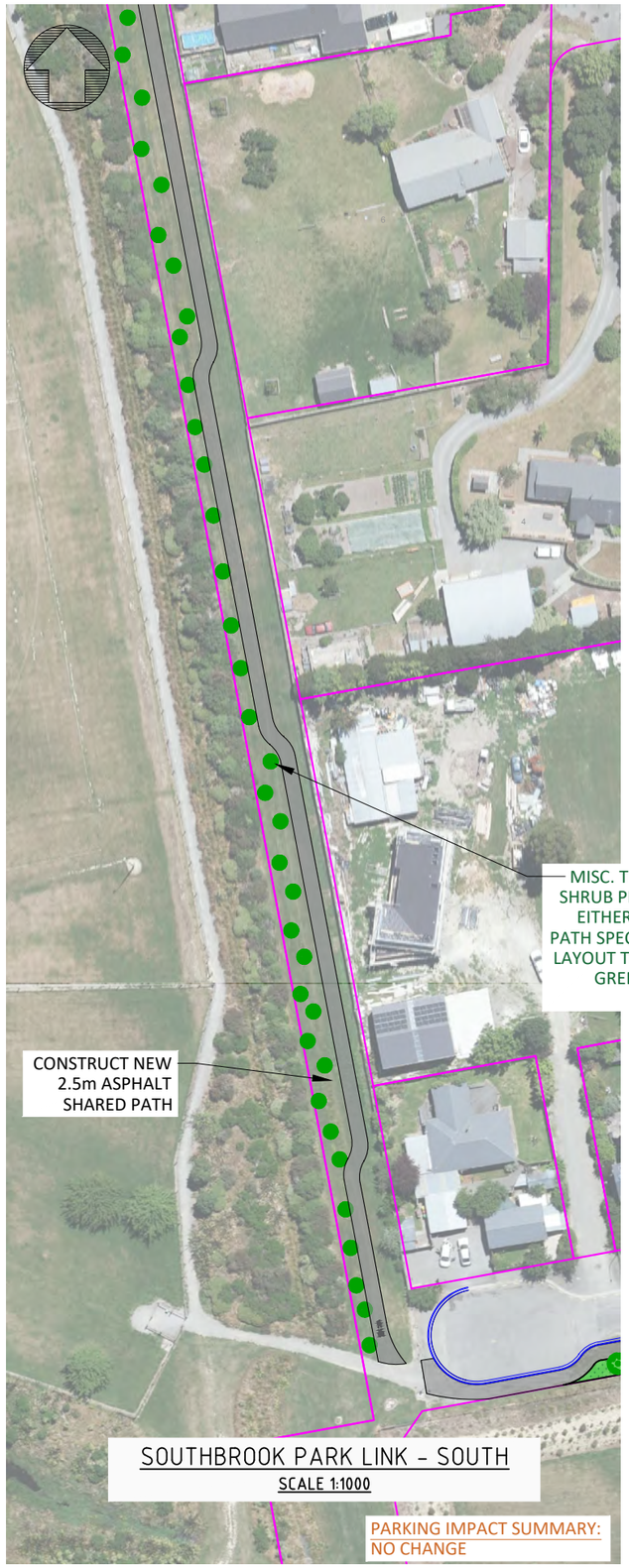
PRELIMINARY
NOT FOR CONSTRUCTION

DRAWING 4354

SHEET 3

REVISION A

PLOT DATE: 10/03/2023 FILE: C:\USERS\AARONK\DOCUMENTS\LOCAL CAD FILES\SOUTHBROOK TORLESSE\SOUTHBROOK DETAILED DESIGN - WORKING DWG - CYCLEWAY PLAN.DWG



SOUTHBROOK PARK LINK - SOUTH

SCALE 1:1000

PARKING IMPACT SUMMARY:
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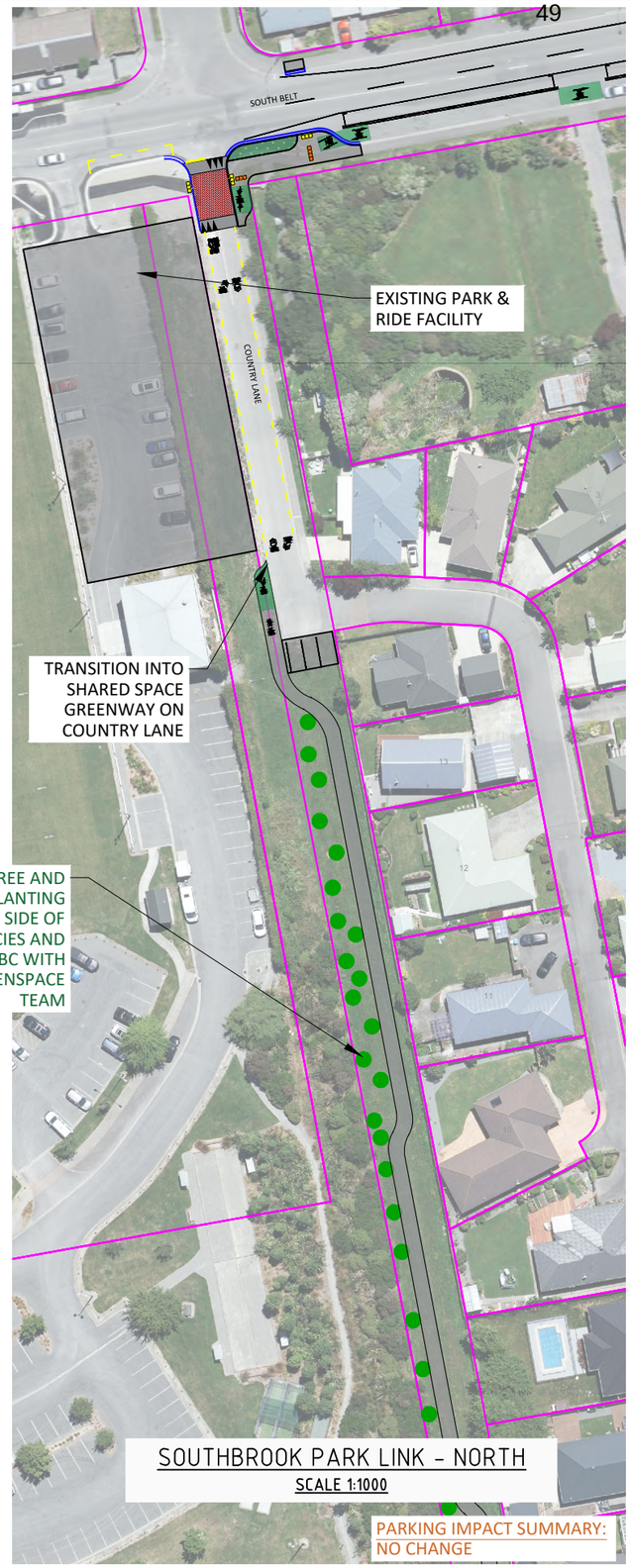

SOUTHBROOK PARK LINK - NORTH

SCALE 1:1000

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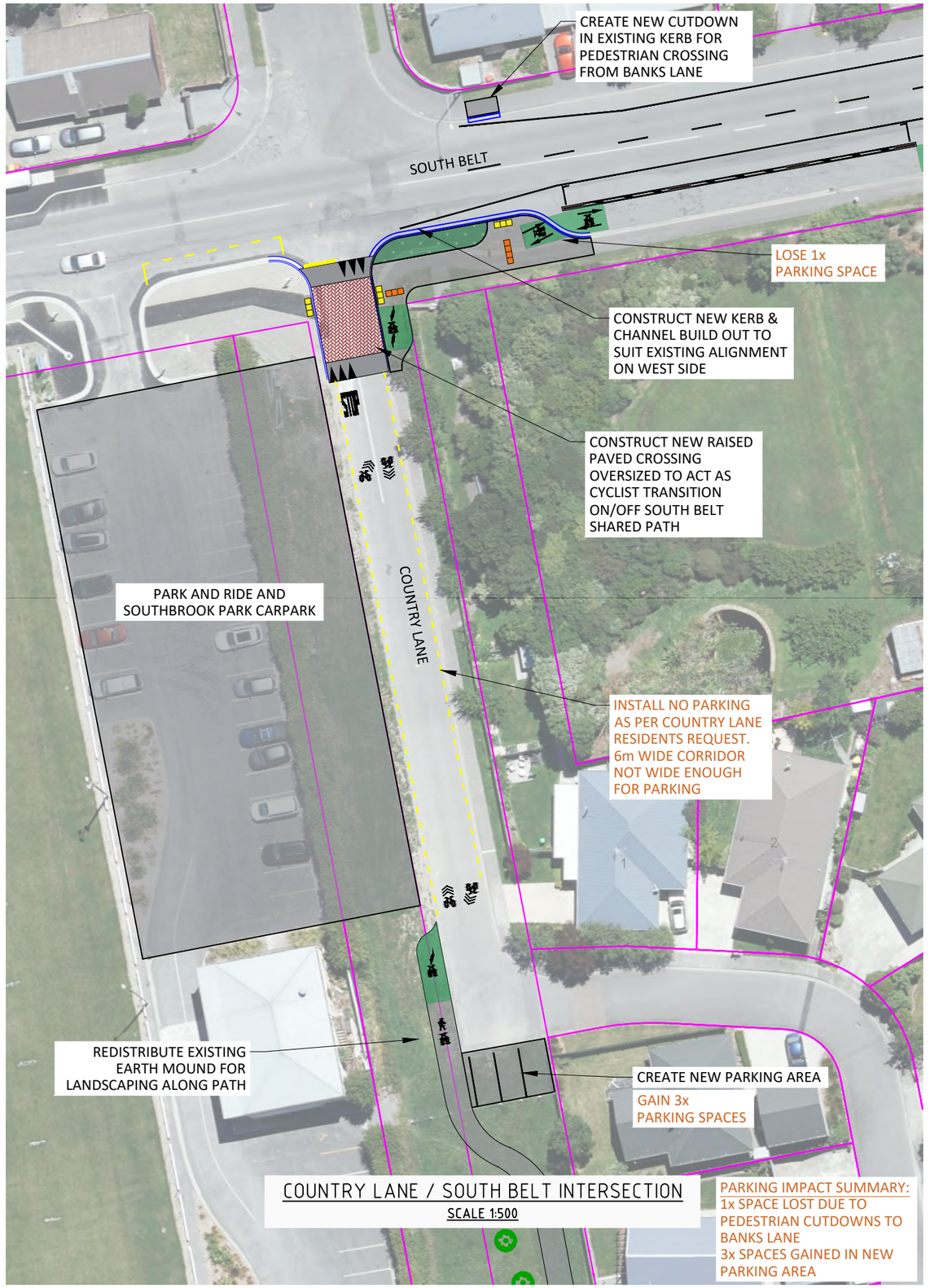


COUNTRY LANE / SOUTH BELT INTERSECTION

SCALE 1:500

PARKING IMPACT SUMMARY:
1x SPACE LOST DUE TO PEDESTRIAN CUTDOWNS TO BANKS LANE
3x SPACES GAINED IN NEW PARKING AREA

REV	REVISION DETAILS	DRN	CHK	APP	DATE
A	SCHEME DESIGN	AK	---	---	16/02/2023
B	ADJUSTMENTS MADE FOLLOWING RESIDENT STREET MEETING	AK	---	---	08/03/2023

SURVEYED	---	---	PROJECT No	
DRAWN	AK	08/02/2023	CON No	22/50
DRAWING CHKD	---	---	SCALE (A3)	AS SHOWN
DESIGNED	---	---	DATUM ORIGIN	
DESIGNED CHKD	---	---	HORIZONTAL	NZTM GD2000
APPROVED	---	---	VERTICAL	

WAIMAKARIRI DISTRICT COUNCIL

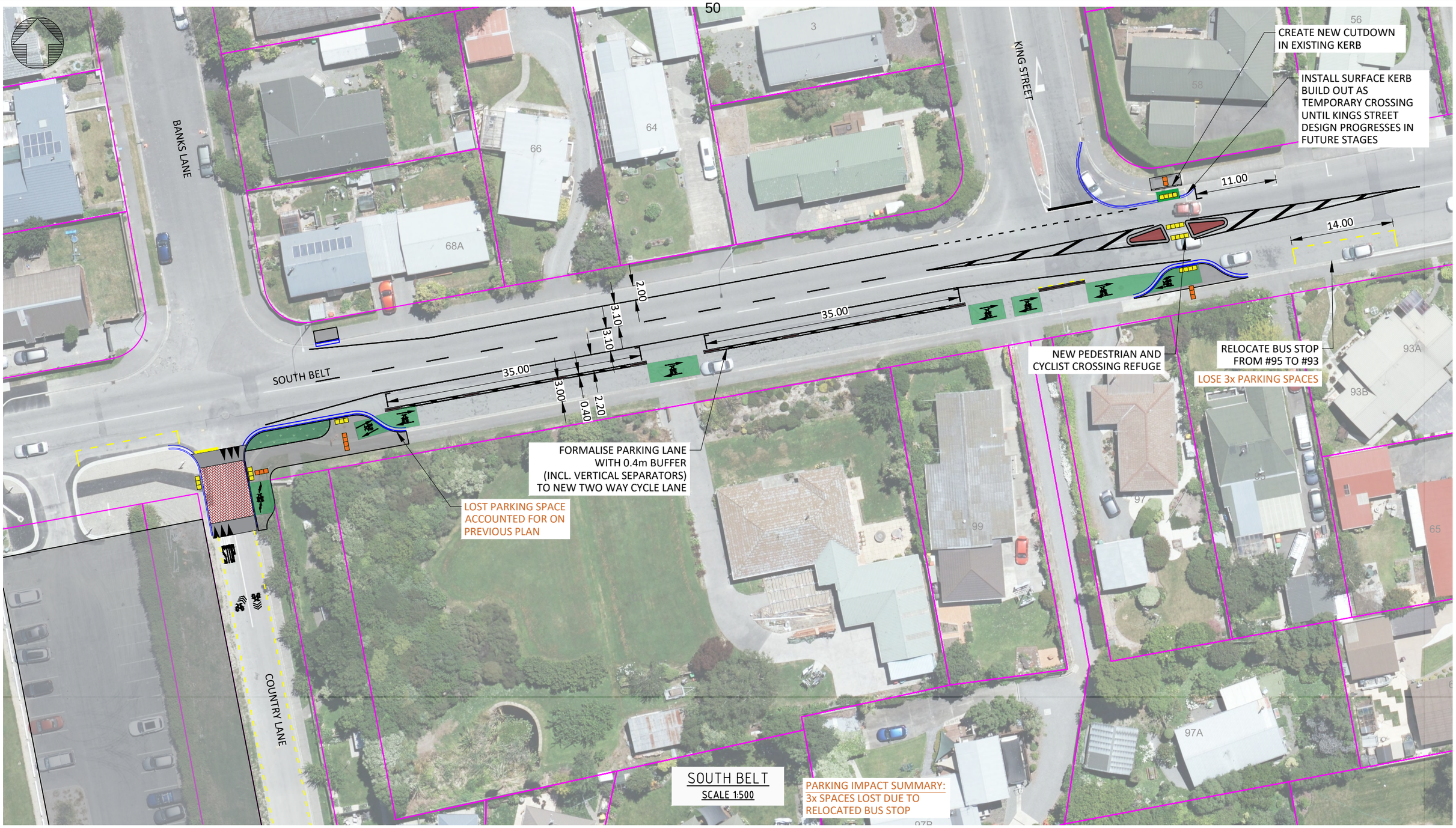
PROJECT: RANGIORA TOWN CYCLEWAY

SHEET TITLE: COUNTRY LANE / SOUTHBROOK PARK

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWING 4354

SHEET 4 | REVISION B



SOUTH BELT
SCALE 1:500

PARKING IMPACT SUMMARY:
3x SPACES LOST DUE TO RELOCATED BUS STOP

REV	REVISION DETAILS	DRN	CHK	APP	DATE
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SURVEYED	---	---	PROJECT No
DRAWN	AK	16/02/2023	CON No 22/50
DRAWING CHKD	---	---	SCALE (A3) 1:500
DESIGNED	---	---	DATUM ORIGIN
DESIGNED CHKD	---	---	HORIZONTAL NZTM GD2000
APPROVED	---	---	VERTICAL

WAIMAKARIRI DISTRICT COUNCIL

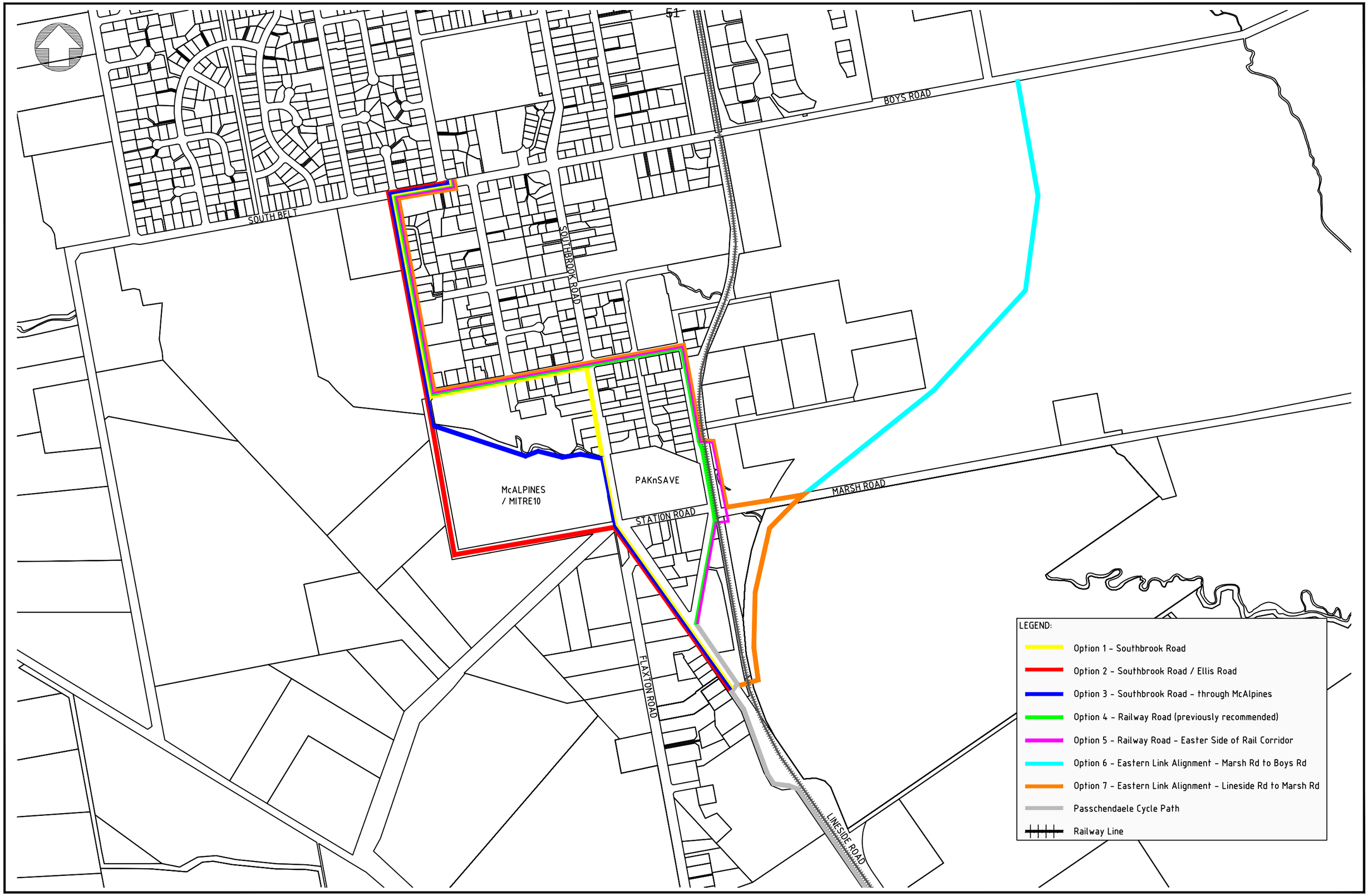
PROJECT: RANGIORA TOWN CYCLEWAY

SHEET TITLE: SOUTH BELT

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWING 4354

SHEET 5 | REVISION A



REV	REVISION DETAILS	DRN	CHK	APP	DATE
A	ALTERNATIVE ROUTE OPTIONS	AK	KS	---	05/04/2023

SURVEYED	---	---	PROJECT No PD001951
DRAWN	AK	05/04/2023	CON No ---
DRAWING CHKD	KS	05/04/2023	SCALE (A3) NTS
DESIGNED	---	---	DATUM ORIGIN
DESIGNED CHKD	---	---	HORIZONTAL NZTM GD2000
APPROVED	---	---	VERTICAL

WAIMAKARIRI DISTRICT COUNCIL

PROJECT

RANGIORA TOWN CYCLE WAY

SHEET TITLE

ROUTE OPTION PLANS

FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWING 4366

SHEET 01 | REVISION A

PLOT DATE: 05/04/2023 FILE: S:\PDU\PDU JOBS\PD001900-1999\PD001951 - RANGIORA TOWN CYCLEWAY (STAGE 1)\2 - DESIGN\RANGIORA TOWN CENTRE CYCLEWAY - ALTERNATIVE ROUTES.DWG

Project Number: 6-DHLHH.01

Cycleway Railway Rd between Lineside Rd and Torlesse St

5 April 2023

CONFIDENTIAL

Transport Choices

Waimakariri District Council

Delivering Strategic Cycling Networks

Safety Review

wsp

150 YEARS IN AOTEAROA

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Document Details:

Date: 4 April 2023
Reference: 6-DHLHH.01 60132
Status: For Client Review

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Approved for release by

Claire-Louise Bode
Project Manager

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Document History and Status

Revision	Date	Author	Reviewed by	Approved by	Status
1	3/04/2023	G. Bean	T. Burt	W. Macbeth	Client Review
2	4/04/2023	G. Bean	T. Burt	CL. Bode	Client Review

Revision Details

Revision	Details
1	Issued for client review
2	Issued for client review

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List of Figures

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Disclaimers and Limitations

This report ('**Report**') has been prepared by WSP exclusively for Waimakariri District Council (WDC) ('**Client**') in relation to a safety review of a proposed Cycleway on Railway Rd between Lineside Rd and Torlesse Street ('**Purpose**') and in accordance with the WSP task request 60132 Methodology and Assumptions submitted to, and approved by the Client, 28 March 2023. The findings in this Report are based on and are subject to the assumptions specified in the Report and WSP offer of service Methodology and Assumptions. 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.

In preparing the Report, WSP has relied upon data, surveys, analyses, designs, plans and other information ('**Client Data'**) provided by or on behalf of the Client. Except as otherwise stated in the Report, WSP has not verified the accuracy or completeness of the Client Data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this Report are based in whole or part on the Client Data, those conclusions are contingent upon the accuracy and completeness of the Client Data. WSP will not be liable in relation to incorrect conclusions or findings in the Report should any Client Data be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

The findings and recommendations in the Report are based on an examination of the available relevant plans, the specified road and its environs, and the opinions of our safety review team. However, it must be recognised that eliminating safety concerns cannot be guaranteed since no road can be regarded as absolutely safe and no warranty is implied that all safety issues have been identified in this report. A safety review does not constitute a design review nor an assessment of standards with respect to engineering or planning documents.

Readers are urged to seek specific technical advice on matters raised and not rely solely on the report.

While every effort has been made to ensure the accuracy of the report, it is made available on the basis that anyone relying on it does so at their own risk without any liability to the safety review team or their organisations.

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1 Safety Review

This safety review is an independent review of a future transport project to identify any safety concerns that may affect safety performance and identify road safety issues or opportunities for safety improvement.

Any recommended mitigation of an identified safety concern is intended to be indicative only, and to focus the design team on the type of improvements that might be appropriate. It is not intended to be prescriptive and other ways of improving the road safety or operational problems identified should also be considered. The qualitative assessment requires professional judgement and a wide range of experience in projects of all sizes and locations along with the Safe System Approach outlined below.

1.1 Safe System Approach

The Safe System approach acknowledges that as people we all make mistakes; a mistake should not mean someone dies or is seriously injured on our roads. It's also an approach that values everyone using the road, not just those in vehicles. It is about caring for more **vulnerable road users like people walking or cycling, children and the elderly**.

Some background is presented in **Appendix B** which forms the basis of our approach and thinking to the safety review.

Managing energy on the network is central to achieving minimising harm. Kinetic energy is the energy associated with the movement of an object and is determined by a combination of speed and mass [$E_k = ½\ mv^2$ where E_k = kinetic energy (Joules), m = mass (kg) , v= velocity (m/s)].

Speed causes some crashes, and it determines the severity of every crash. Even small reductions in travelling speed can have large effects on injury outcomes and the creation of an inherently safe road system is largely dependent on the kinetic energy in the system. One of the reasons why the road network is inherently unsafe is because the main determinants of crash severity (i.e., speed and mass) are not compensated for when combining different road user groups together. Heavy vehicles provide a major Safe System challenge as one of the determinants of crash severity is mass. In many situations heavy vehicles operate at the same speeds as other vehicles in the network despite the large mass differentials that exist. This makes the task of mitigating death and serious injury outcomes a challenge.

For conflicts between vehicles and unprotected road users (i.e., pedestrians, cyclists and motorcyclists), impact speeds should not exceed 30 km/h regardless of geometric layout, if pedestrian and cyclist risks of death are to remain below the nominated level of 10% [acknowledging however the different outcomes when struck by vehicles of different mass].

1.2 Treatments to Improve Safe System Alignment

Some treatments can improve the Safe System alignment of a project (refer Appendix B).

- **Primary treatments** are those measures that have the potential to eliminate or come close to eliminating the risk of fatal and serious injury (FSI) crashes.
- **Supporting treatments** are effective in reducing the risk of FSI crashes but not to the extent of a primary treatment (i.e., there is a residual moderate or significant FSI crash risk). Implementation of a primary treatment should be given priority over a supporting treatment that may be targeting a similar crash risk.

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2 Project Description

2.1 Project Background and Objective

WDC has a Transport Choices cycleway project to connect the Passchendaele Path at the southern end of Rangiora with the Rangiora Town Centre. The first stage is on Railway Rd between Lineside Rd and Torlesse Street.

WDC requested a safety review evaluating the current proposal, noting foreseeable safety issues, and possible mitigation measures. This review is a separate issue to the review of future options at the Marsh Rd intersection, as the cycleway will be installed within the current intersection layout, although as part of mitigating measures, interim changes can be made to the allocation of road space, kerb alignments etc. WDC are also in discussion with KiwiRail regarding the required LCSIA for installation of a cycleway adjacent to the rail corridor.

The scope of the safety review is immediately south of the Marsh Rd intersection, to immediately north of the Pak'nSave entrance on Railway Rd.

2.2 Documents Provided

The safety reviewer has been provided with:

- attachment v. from a recent WDC U&R report, showing proposed alignment of the path, and tracking curves associated with Pak'nSave delivery vehicles.
- extract from the report with Pak'nSave concerns, and council response.
- original email from Pak'nSave with their concerns

The WDC plan provided is at Preliminary Scheme Design stage.

2.3 Type of Cycle Facility

Most of the written documentation provided for review refers to the facility as being a cycleway. It is noted however that the WDC plan provided shows shared path markings and pedestrian (yellow) tactile pavers and raised safety platform pedestrian crossing north of Pak'nSave. It would be good to confirm the facility type as separated cycleway or shared path and use that description for the project going forward as that will help with the design process as well as communications and engagement with stakeholders. For the purposes of this safety review, the reviewer has assumed it will be a shared path.

2.4 Meetings and Site Inspections

A briefing meeting between WSP and WDC was held on 24 February 2023 for the Task Request 60130 Options Assessment - Station Road/Marsh Road intersection, where the cycleway was discussed. The safety reviewer was present for the briefing but has not visited the site.

2.5 Previous Safety reviews

The safety reviewer is not aware of any previous safety reviews.

2.6 Existing Speed Limit

The National Speed Limit Register shows all roads in the immediate vicinity of the Railway Road / Station Road intersection are 50kph and Marsh Road is 100kph.

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3 Safety Considerations

3.1 Right turn tracking from Station Road

The WDC plan shows indicative tracking for a semi-trailer right turning from Station Road to Railway Road. Given the geometry of the intersection, proposed shared path and size of a semi-trailer, the tracking as shown requires some 40 to 50m for the body of the semi-trailer to clear the opposing northbound traffic lane. The reviewer considers the following should be reviewed:

- start the tracking from the Pak'nSave development left turn out to ensure the position at the intersection (for the right turn) reflects that which would be expected by Pak'nSave semi-trailers.
- confirm if an appropriate sightline can be established from the Station Road driver position; both for HCV and light vehicle; especially given the roadside car parking that could block sightlines (especially if a high sided van parked there).
- consideration of time taken for the body of the semi-trailer to clear the opposing (northbound) traffic lane and how this relates to the sightline, stopping sight distance and how drivers might respond to a HCV being on "their side of the road"

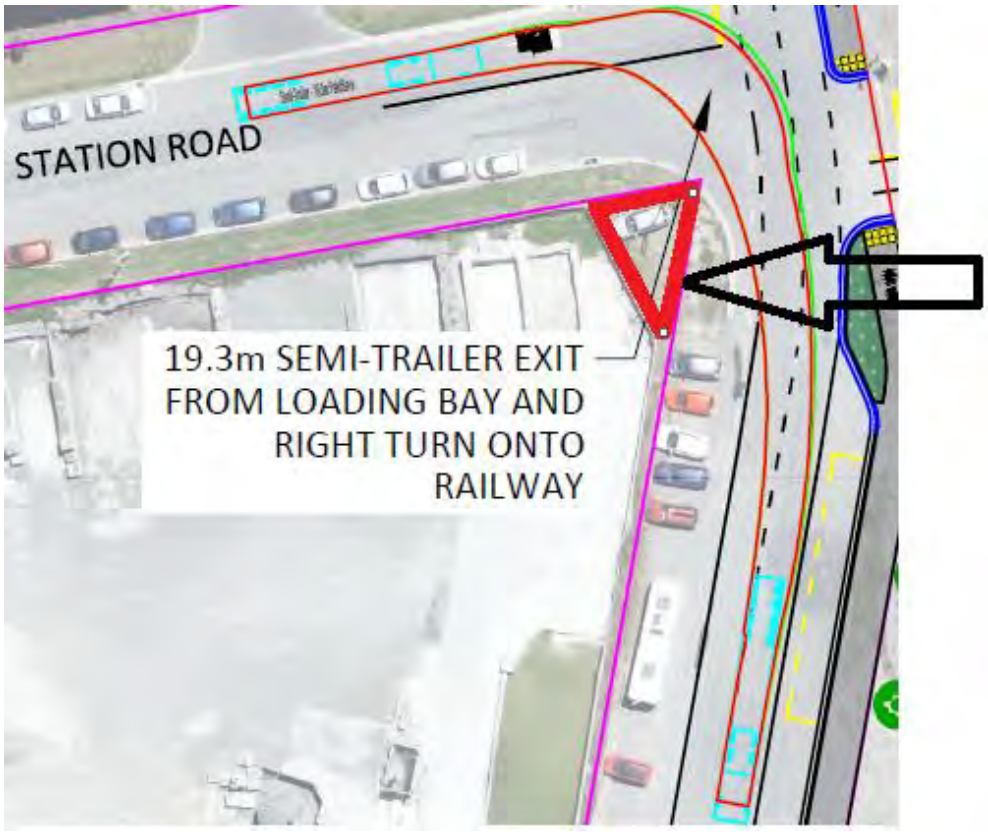

Figure 3-1: Semi-trailer right turn tracking from Station Road

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Figure 3-2: Sightline for right turn from Station Road

Possible Mitigation

The safety issue identified above should be able to be adequately mitigated by reconfiguring the intersection layout.

We have carried out some preliminary tracking and estimate it would take in the order of 18 seconds for a semi-trailer to clear the opposing northbound traffic lane. This time and distance to clear the opposing lane means the requirements for sightline and stopping sight distance or safe intersection sight distance (allows northbound driver 3s observation time of truck turning) are reasonably onerous.

As a potential mitigation we have considered at a conceptual level the option of altering the priority at the intersection as shown below. Amore detailed design would establish if any land purchase is required.

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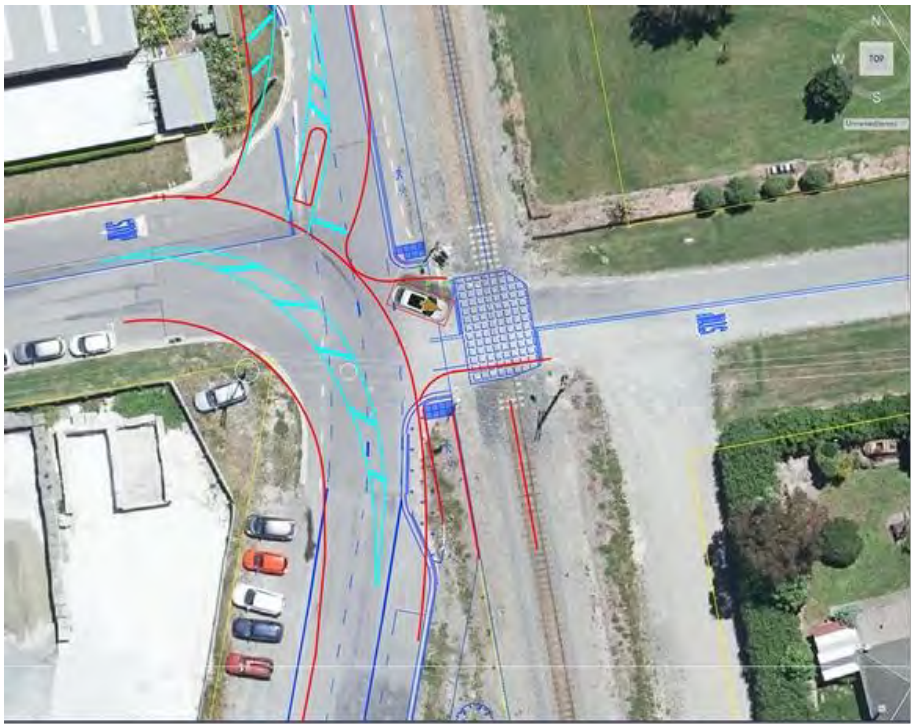

Figure 3-3: WSP concept to reconfigure priority of intersection Station Road/ Railway Road

This type of layout may achieve the following:

- lower operating speed at the intersection
- facilitate the "right turn" of semi-trailer from Station Road to Railway Road
- facilitate semi-trailer entering the Pak'nSave on-street parking (Railway Road) by removing kerb build out
- assist with potential spatial requirements from KiwiRail for rail level crossing related to signs and traffic control devices
- assist with achieving better intervisibility between left turners southbound on Railway Road and southbound shared path users (crossing the rail level crossing)

  [note the "island" shown on Railway Road north of Station Road would need to be low and mountable for the left turn in of a semi-trailer]

3.2 Widths for various road user types

The plans provided do not show widths however discussion with WDC confirm widths on Railway Road north of Station Road to be in the order of:

- Shared Path width = 2.5m
- Traffic lanes northbound and southbound = 3.2m
- Parking space for Pak'nSave operators (e.g., semi-trailer HCV) = 2.5m

With the shared path being adjacent to the rail corridor KiwiRail may require a fence along the boundary (5m from rail); which will create a shy zone. Shy zones will also often exist where shared paths are adjacent opposing traffic lanes. The effect of this is that users may tend to use the central area of the shared path more often and move more to the outer edges when passing (same direction or opposing, pedestrian or cyclist). The length of shared path between Station Road and the proposed raised safety platform (with pedestrian crossing facility) is about 80m. WDC advised traffic volumes on Railway Road are about 875vpd south of the Pak'nSave entrance/ exit (and 675vpd north of the Pak'nSave entrance/ exit). A peak hour traffic volume of say 15%, split 50/50 north/ south would see about 65 vph each way or about 1 vehicle every minute adjacent the shared. A cyclist travelling about 15kph will travel the 80m in about 20 seconds. The proposed raised safety

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platform (with pedestrian crossing facility) will moderate speed to around 30kph in that area and reconfiguring the intersection at Railway Road/ Station Road will moderate speed there as well. Considering the above points, the shared path should adequately provide for users in this relatively low speed, low volume environment.

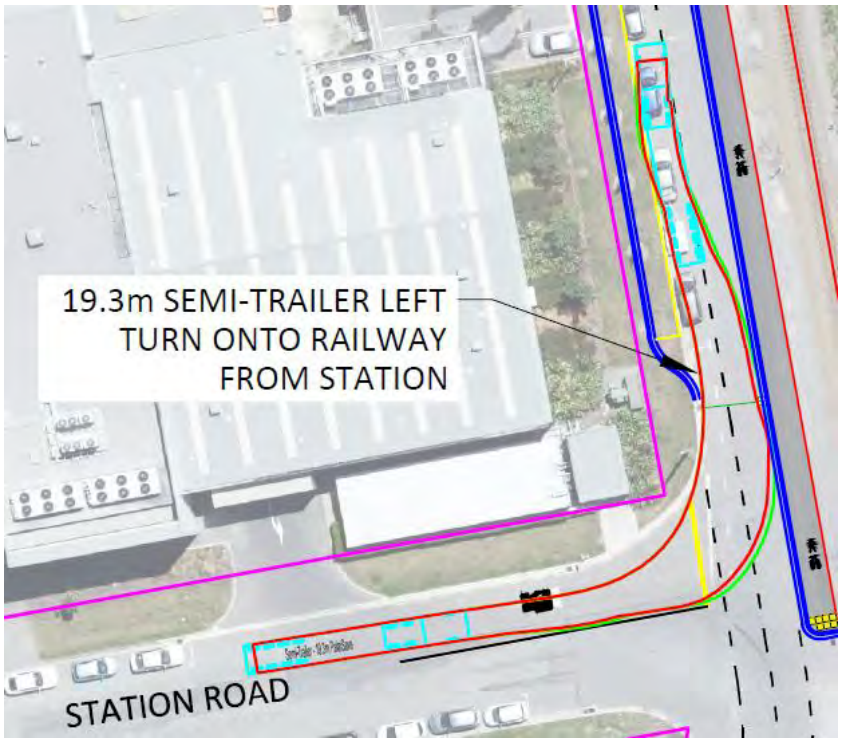

Figure 3-4 Station Road (LT out tracking)

Possible Mitigation

- Providing a coloured buffer on a shared path adjacent an opposing traffic lane is useful for giving guidance to users to stay shy of that area unless needed when passing (same direction or opposing, pedestrian or cyclist).

Figure 3-5 Shared Path with red coloured surface buffer (Canada St, Auckland City)

- An edgeline could be marked to demarcate the extent of the 2.5m wide on-street parking provided for Pak'nSave operators to provide guidance to users of where their vehicle should be postioned while parked

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3.3 Pak'nSave on-street parking HCV

Given the redistribution of road space brought about by the proposed shared path, a check should be made of the tracking of Semi-trailer HCV into the on-street parking provided for Pak'nSave operators to ensure the HCV is aligned parallel to the kerb without the right rear protruding into the proposed northbound traffic lane. Furthermore, a check of left turn tracking into the Pak'nSave development from the "head" of the on-street parking space should be made.

If the right rear of a HCV protruded into the traffic lane this could affect safety for northbound users and potentially reduce the sightline (to establish HCV left turn over centreline or right turn) for traffic exiting Station Road.

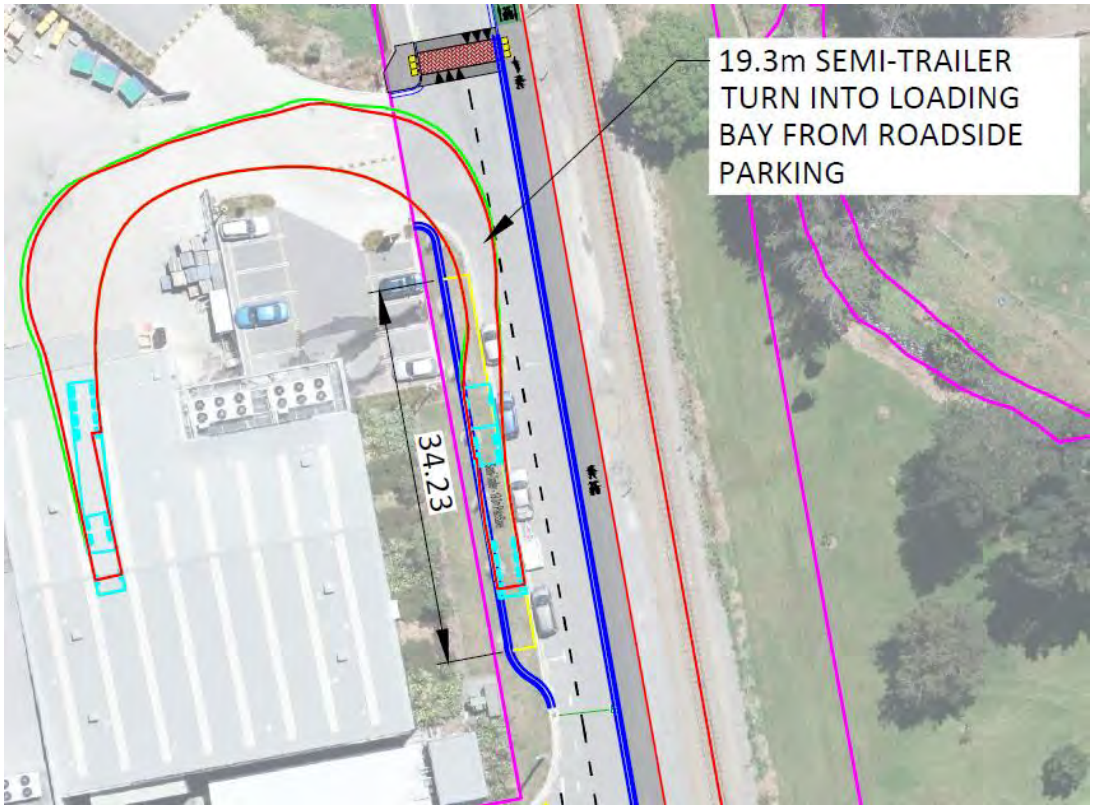

Figure 3-6: WDC plan Pak'nSave on-street parking

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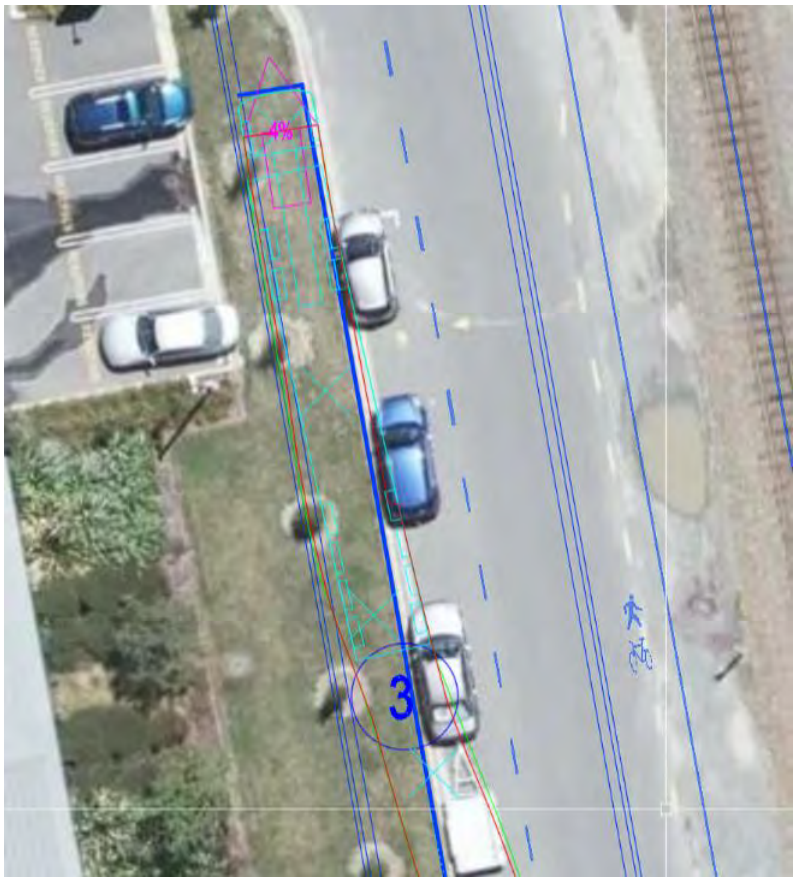

Figure 3-7: WSP query whether semi-trailer can park parallel to kerb without encroaching traffic lane

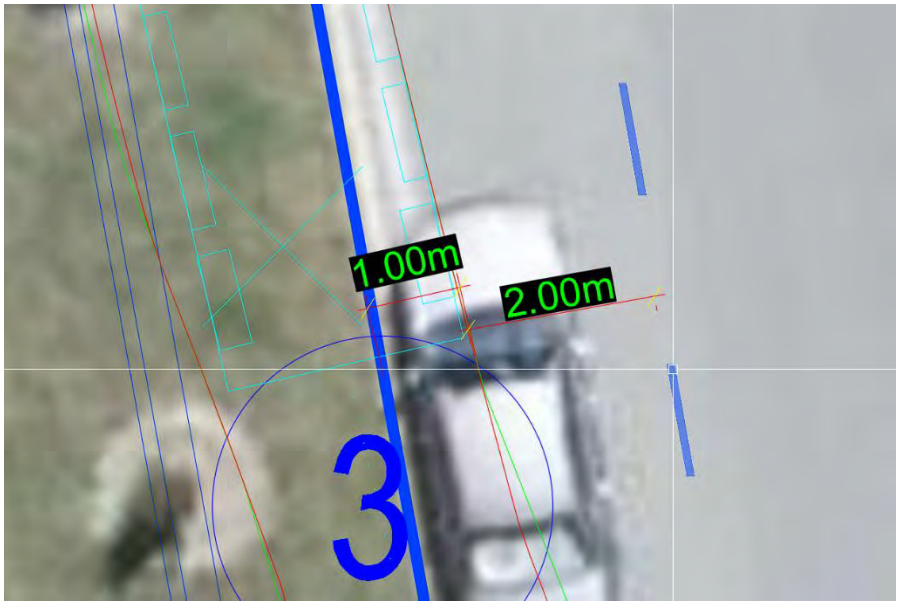

Figure 3-8: WSP query does semi-trailer encroach into traffic lane

Possible Mitigation

The safety issue identified above should be able to be adequately mitigated by confirming:

- The tracking of HCV into the on-street parking area (based on proposed widths; outlined earlier in report) and any overhang of right rear of HCV into traffic lane

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- Any requirement to ease the kerb line on entry to the on-street parking area to enable HCV to park parallel to the kerb clear of the traffic lane (this could be achieved as part of any proposed intersection reconfiguration)
- An edgeline could be marked to demarcate the extent of the 2.5m wide on-street parking provided for Pak'nSave operators to provide guidance to users of where their vehicle should be postioned while parked

3.4 Rail Level Crossing

Consideration of the rail level crossing to/from Marsh Road was noted as being out of scope for this review and WDC are in discussions with KiwiRail. The safety reviewer notes that depending on the outcome of KiwiRail discussions, the design as shown by WDC could change with consequential effects on other parts of the design. For example:

- Consideration of left turn tracking for design vehicle from Marsh Road to Railway Road might change the shape and/or location of the shared path crossing point, which might make the crossing point longer than shown.
- The agreed (with KiwiRail) signs, markings, devices for the level crossing may have an impact on the space where the WDC plan shows the shared path if such devices are not placed within 5m of the rail line, which would further narrow the shared path.
- The left turn from Railway Road across the level crossing to Marsh Road requires careful consideration. This is especially so for HCV which have specific blind spots. There are two scenarios to consider:
    - When there is no need to stop and wait for a train to pass
    - When the HCV needs to stop and wait for a train to pass

  The two different situations likely have different observation opportunities for HCV drivers to see southbound users on the shared path; with presumably the need to stop and yield to rail posing a greater risk of shared path users entering an HCV blind spot.

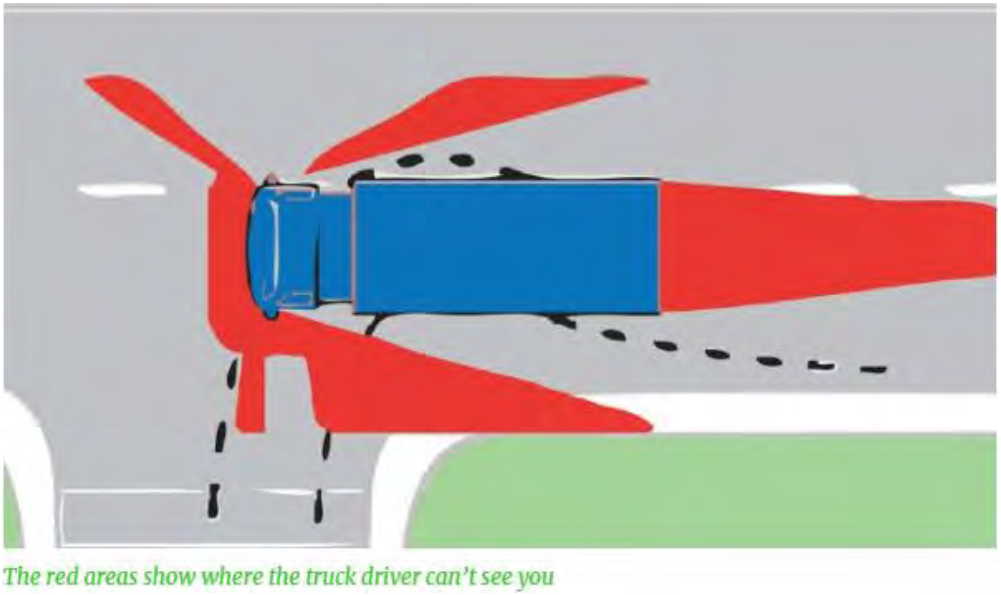

Figure 3-9: HCV BLINDSPOTS [courtesy cyclingchristchurch.co.nz)

Possible Mitigation

The safety issue identified above can be best mitigated by ensuring a left turning (southbound) vehicle (particularly HCV) are squared up to the level rail crossing as much as possible, so the driver gets the best sightlines possible to the shared path.

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This could be achieved through reconfiguring the intersection layout as discussed elsewhere in this report (refer figure 3-3). Reconfiguring the intersection would also create space for any additional signs required in the road reserve for the KiwiRail level crossing.

3.5 Raised Safety Platform pedestrian crossing

The raised safety platform shown north of the Pak'nSave accessway is a Primary treatment aligned with safe system thinking. It will moderate traffic speed which is a benefit for pedestrians crossing the road and by slowing southbound vehicles it assists with other design considerations such as stopping sight distance related to a semi-trailer crossing the centreline doing the left turn out of Station Road

The location for the platform should be checked against the tracking expectations for the left turn out of the Pak'nSave accessway to ensure adequate clearance and visibility to pedestrians using or waiting to use the crossing point (WDC advise Pak'nSave HCV are not meant to do a left turn out of the Railway Road exit, however this might still occur). If HCV are parked in the on-street Pak'nSave operator parking area drivers of exiting vehicles might place a lot of focus on nudging forward to get visibility of northbound traffic, then commence their left turn manoeuvre with immediate conflict of pedestrian(s) on the raised safety platform.

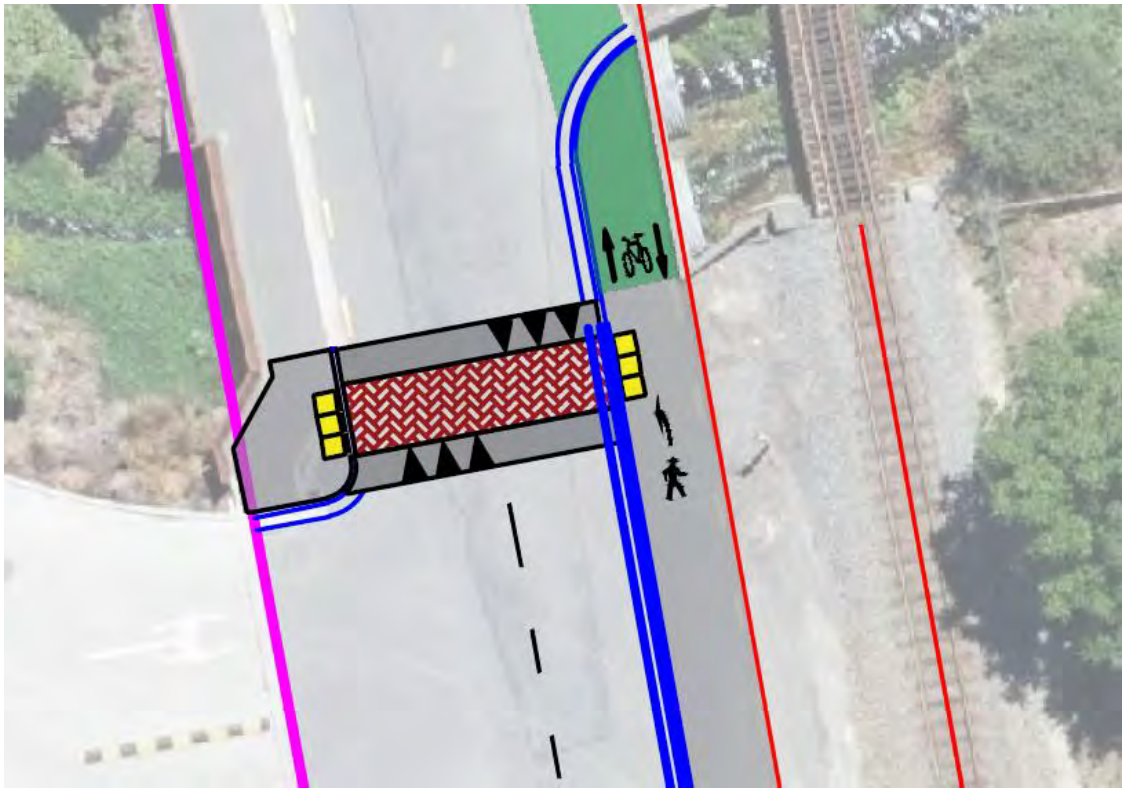

Figure 3-10: Proposed Raised Safety Platform (pedestrian crossing) north of Pak'nSave (Railway Road)

Possible Mitigation

The safety issue identified above can be best mitigated by ensuring a left turning vehicle (exiting Pak'nSave can square up to the proposed pedestrian facility (on raised safety platform) to ensure the driver gets the best visibility of pedestrians possible. This can be achieved by moving the proposed location further north of the Pak'nSave exit.

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3.6 Recreational Vehicle Effluent Disposal

The 2019 Streetview image shows an area marked for the disposal of waste from caravans, recreational vehicles and the like. The berm area contains posts, poles and the disposal drainage system for waste.

Figure 3-11: Recreational vehicle effluent disposal site - existing

The WDC preliminary plan shows a similar area demarcated with yellow broken lines adjacent the proposed shared path however it is not clear how much space is provided for this activity and how that would be separated from users of the shared path; particulary people on bikes. The reviewer notes the adjacent triangle land parcel labelled “22” could provide an opportunity to divert the shared path for a short distance away from the effluent disposal area; creating separate spaces for the different user groups. There is a risk with persons disposing of effluent being preoccupied with that task stepping into the path of a bicycle and/or depending on the design, associated equipment being on or across the path.

Possible Mitigation

Of note, other parts of this report have considered an alternative intersection layout that will require careful design to integrate the Recreational Vehicle Effluent Disposal site and adjacent shared path. This can only be clarified through detailed design.

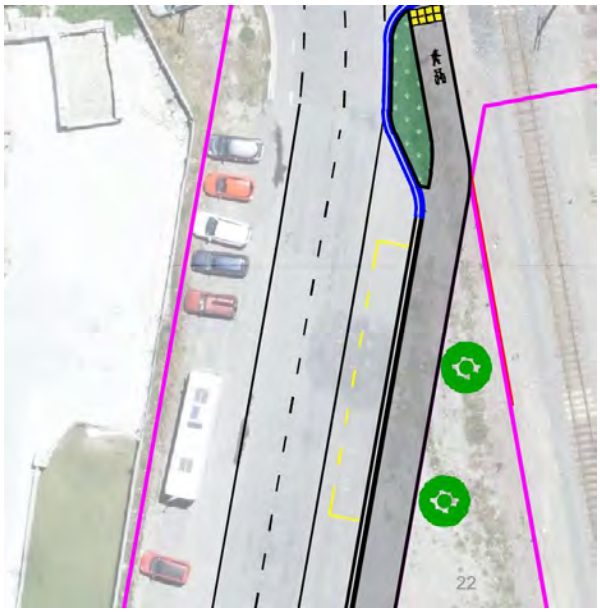

Figure 3-12: Recreational vehicle effluent disposal site - proposed

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3.7 Streetlighting

The reviewer assumes the design will consider what lighting is required for the shared path; with special consideration at intersection points such as Marsh Road and the raised safety platform pedestrian crossing north of Pak'nSave.

3.8 Type of Cycle facility

Most of the written documentation provided for review refers to the facility as being a cycleway. It is noted however that the WDC plan provided shows shared path markings and pedestrian (yellow) tactile pavers and raised safety platform pedestrian crossing north of Pak'nSave. It would be good to confirm the facility type as separated cycleway or shared path and use that description for the project going forward as that will help with the design process as well as communications and engagement with stakeholders. For the purposes of this safety review, the reviewer has assumed it will be a shared path.

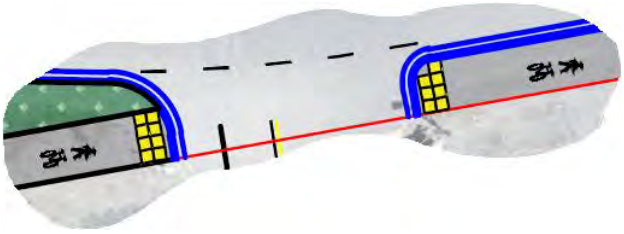

Figure 3-13: shared path markings and pedestrian (yellow) tactile pavers

3.9 Tie-in of Cycle Lane north of Pak'nSave

It is assumed there is further work to complete the tie-in of the cycle lane facility north of Pak'nSave to provide a safe and legible facility for people on bikes.

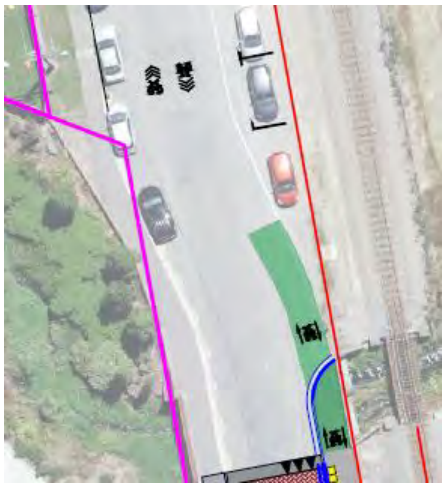

Figure 3-14: Tie-in north of Pak'nSave (Railway Road)

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4 Summary

WDC has a cycleway project to connect the Passchendaele Path at the southern end of Rangiora with the Rangiora Town Centre. The first stage is on Railway Rd between Lineside Rd and Torlesse Street. This safety review considered the length immediately south of the Marsh Rd intersection, to immediately north of the Pak'nSave entrance on Railway Rd and is separate to the review of future options at the Marsh Rd intersection.

Having reviewed the documents provided it is considered that the Shared Use Path could be established to provide an appropriate level of amenity and safety for road users in the area if the following are considered:

- Confirm KiwiRail requirements for the level rail crossing signs/ markings/ controls as this will confirm spatial requirements for these devices and be integrated into the detailed design
- Reconfigure the intersection layout of Railway Road/ Station Road to achieve the following:
  - lower operating speed at the intersection
  - facilitate the "right turn" of semi-trailer from Station Road to Railway Road
  - assist with potential spatial requirements from KiwiRail for rail level crossing related to signs and traffic control devices
  - assist with achieving better intervisibility between left turners southbound on Railway Road (crossing the rail level crossing) and southbound shared path users. This ensures a left turning (southbound) vehicle (particularly HCV) are squared up to the level rail crossing as much as possible, so the driver gets the best sightlines possible to the shared path
- Providing a coloured buffer surface (e.g., 300mm wide) on the shared path between Station Road and the proposed Raised Safety Platform (pedestrian crossing facility)
- Marking an edgeline to demarcate the extent of the 2.5m wide on-street parking provided for Pak'nSave operators to provide guidance to users of where their vehicle should be postioned while parked
- Reviewing HCV tracking into the on-street parking provided for Pak'nSave operators to ensure these vehicles can park parallel to the traffic lane, without "overhang" to the traffic lane (this will determine whether the entry to the parking is adequate or needs to be eased)
- Move the location of the proposed pedestrian facility (on raised safety platform) further north of the Pak'nSave exit to enable left turning vehicles (exiting Pak'nSave) to "square up" to the crossing area to ensure the driver gets the best visibility of pedestrians possible. This can be confirmed through vehicle tracking at detailed design.
- Attention to detail of the operating requirements for the Recreational Vehicle Effluent Disposal site, the adjacent shared path and integration with intersection reconfiguration. This can be clarified through detailed design.
- Consideration of Streetlighting requirements
- Consideration of sharedpath "Tie-In" north of Pak'nSave

Whilst there are several points raised in this report this is not unexpected at the earlier stage of project development. WDC has received feedback from some stakeholders and ongoing engagement will ensure various road user perspectivies are considered and incorporated into the detailed design (which would be safety audited).

On that basis, it should be possible to establish a transport environment that would provide an acceptable level of safety and amenity for the various user groups in this area.

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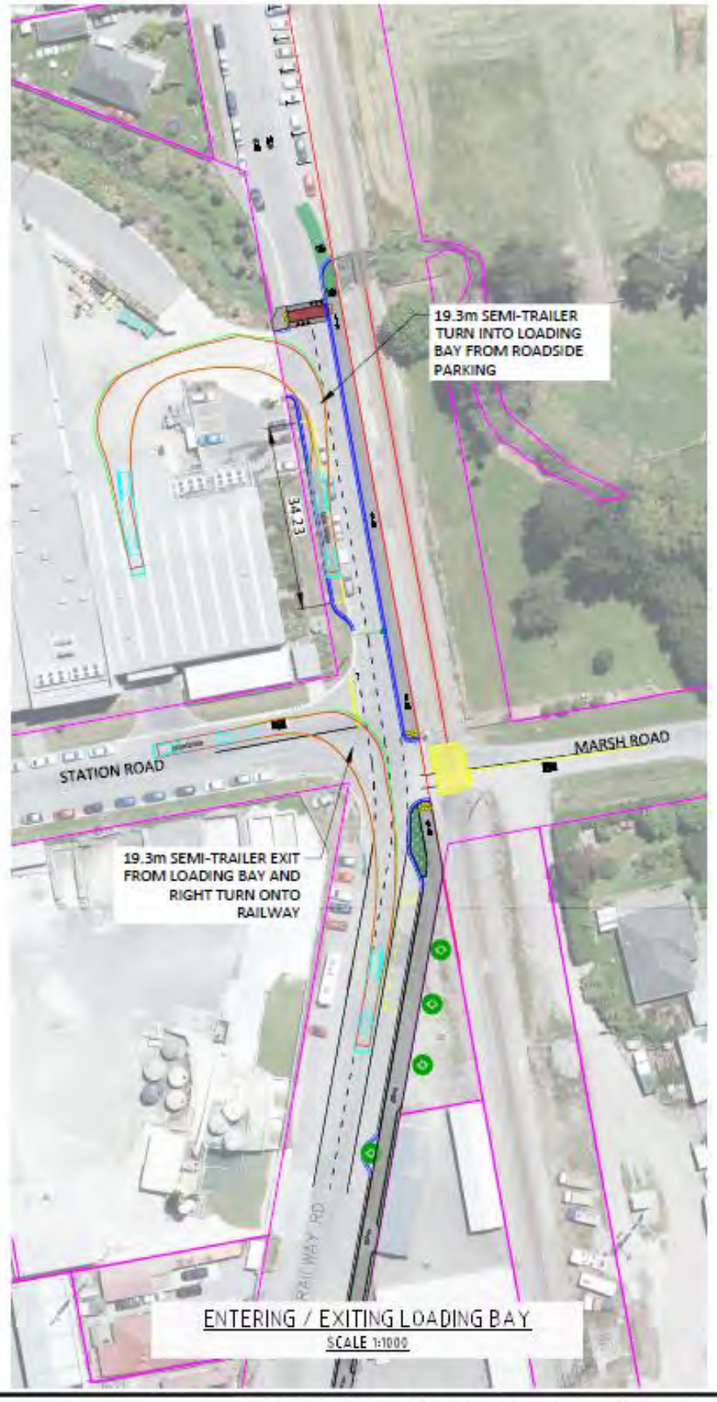
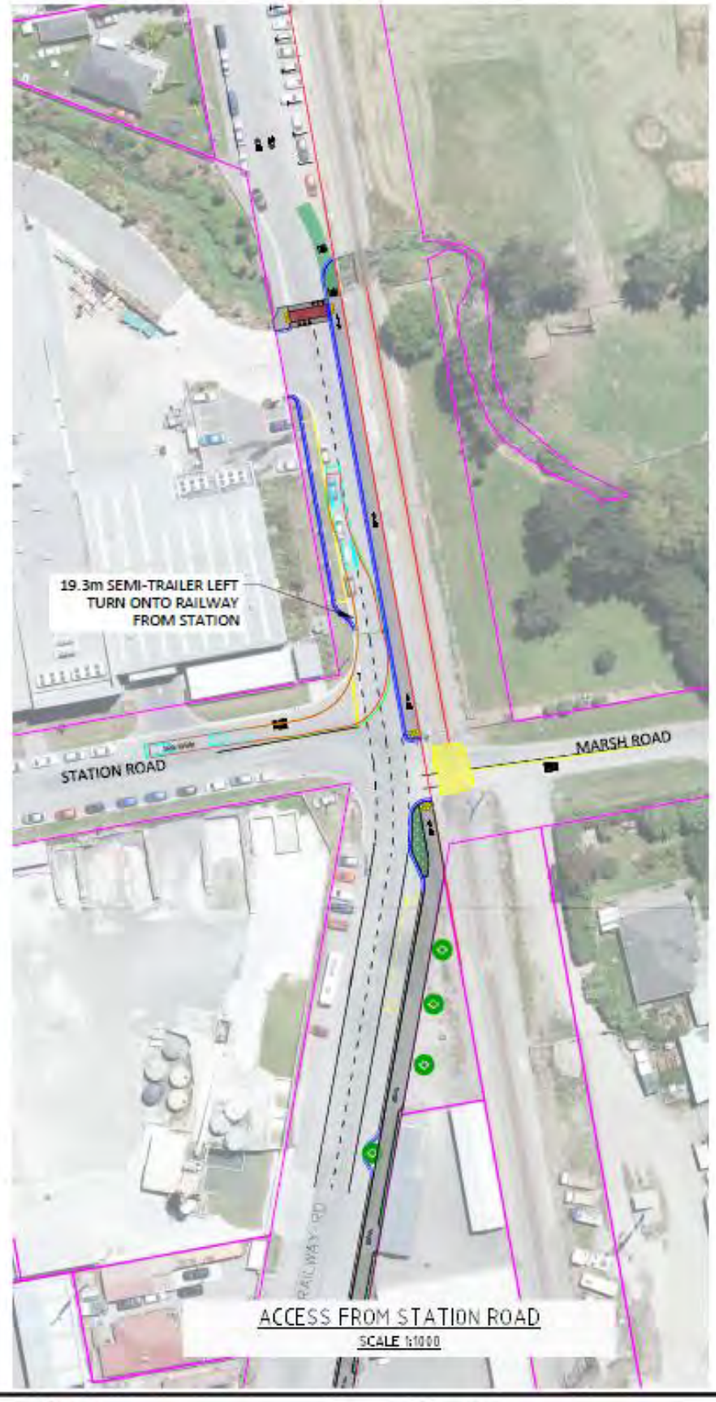
Appendix A
WDC Preliminary Scheme Design – Railway Road Pak'nSave tracking curves (Rangiora Town Cycleway)



ENTERING / EXITING LOADING BAY
SCALE 1:1000



ACCESS FROM STATION ROAD
SCALE 1:1000

REV	REVISION DETAILS	DRN	CHK	APP	DATE
A	SCHEME DESIGN	AK	--	--	16/02/2023
B	19.3m CUSTOM SEMI-TRAILER TRACKING VEHICLE	AK	--	--	02/03/2023
C	REVISED MARSH ROAD KERB BUILDOUTS	AK	--	--	07/03/2023

SURVEYED	--	--	PROJECT No
DRAWN	AK	16/02/2023	CON No 22/50
DRAWING CHKD	--	--	SCALE (A3) 1:1000
DESIGNED	--	--	DATUM ORIGIN
DESIGNED CHKD	--	--	HORIZONTAL NZTM GD2000
APPROVED	--	--	VERTICAL

WAIMAKARIRI DISTRICT COUNCIL

PROJECT
RANGIORA TOWN CYCLEWAY

SHEET TITLE
RAILWAY ROAD
PAKnSAVE TRACKING CURVES

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWING	
	4354
SHEET	REVISION
00	C

PLOT DATE: 09/03/2023 FILE: C:\USERS\AARON\DOCUMENTS\LOCAL CAD FILES\SOUTHBROOK TOR\LDSS\SOUTHBROOK DETAILED DESIGN - WORKING DWG - CYCLEWAY PLAN.DWG

Appendix B
Safe System & Harm Minimisation

Vision Zero, Safe System & Harm Minimisation

Vision Zero is an ambitious transport safety vision that states that there will be no deaths or serious injuries on our transport system.

The Safe System approach acknowledges that as people we all make mistakes; a mistake should not mean someone dies or is seriously injured on our roads. It's also an approach that values everyone using the road, not just those in vehicles. It is about caring for more **vulnerable road users like people walking or cycling, children and the elderly**.

Waka Kotahi has set out the Road to Zero 2020-2030, New Zealand road safety strategy, outlining what New Zealand needs to do to make improvements in road safety; on a path to achieve Vision Zero, a New Zealand where no one is killed or seriously injured on our roads (https://www.nzta.govt.nz/safety/what-waka-kotahi-is-doing/nz-road-safety-strategy/)

Figure B1: Road to Zero and safe system (Waka Kotahi)

Managing vehicle speeds or energy on the network is central to achieving Vision Zero. Speed causes some crashes, and it determines the severity of every crash. This isn't easy for people to feel instinctively while driving, however modern transport exposes us to crash forces far greater than our bodies have evolved to survive.

Speed management uses engineering to ensure that **survivable speeds** are readily and easily chosen for the right environment. This is called **self-explaining roads**. Safe speeds are one of the main ways of reducing the risk of dying or being seriously injured in urban areas where there are many people, including children and the elderly, walking and crossing.

Aspirational impact speeds aligned to Safe System performance are:

- 30 km/h where pedestrians and cyclists interact with traffic
- 50 km/h where cars may collide at right angles at intersections
- 70 km/h where cars can collide head-on

There can be considerable variance with injury outcome based on variables such as

- **vehicle type** (especially between cars, utes compared with buses and trucks)
- **vehicle age** (technology and performance)
- **age of occupants/ pedestrians**
- use of **seatbelt and/ or airbags** (other technologies)
- variances in the **angle of collisions**.

In relation to crashes, exposure, likelihood, and severity are defined as follows:

- **Exposure** (road user): this refers to which road users, in what numbers and for how long they are using the road and are thus exposed to a potential crash. The measures of exposure include: AADT, side-road traffic volumes, number of motorcycles, cyclists and pedestrians crossing or walking along the road, length of the road, area and length of time.

- Crash **likelihood**: groups of factors affecting the probability of a crash occurring. They can be elements which moderate opportunity for conflict (e.g., number of conflict points, offset to roadside hazards, separation between opposing traffic). They can also include elements of road user behaviour and/or road environment. Typically, these are the elements which moderate road user error rates. This includes issues such as level of intersection control (e.g., priority/ signals/ movement ban), speed, sight distance, geometric alignment, driver guidance and warning. and maintenance (change in practice; implications of timing).

- Crash **severity**: groups of factors affecting the probability of severe injury outcomes should a crash occur. Typically, these factors are associated with the amount of kinetic energy and its transfer in the crash, e.g., impact speeds and angles, severity of roadside hazards.

In summary, considering the above and other guidance in Austroads, a **primary Safe System treatment** will be achieved if the infrastructure results in a **low-speed environment/ speed limit** with the reduction in trauma being derived through reducing **Likelihood** and/ or **Severity**.

Towards Harm Minimisation at Intersections

Section 5.2 of *Towards Safe System Infrastructure: A Compendium of Current Knowledge* [AP-R560-18] suggests a hierarchy of treatments that should be considered for intersections.

Table 5.4: Safe System Assessment Framework hierarchy* of intersection treatments

Hierarchy	Treatment	Influence (E = exposure L = likelihood S = severity)
Safe System options ('**primary' or 'transformational**' treatments)	· Close intersection · Grade separation · Low speed environment/speed limit · Roundabout · Raised platform	L, S E L, S L, S L, S
Supporting treatments (compatible with future implementation of Safe System options)	· Left-in/left-out, with protected acceleration and deceleration lanes where required · Ban selected movements · Reduce speed environment/speed limit.	L, S E L, S

Supporting treatments (does not affect future implementation of Safe System options)	· Redirect traffic to higher quality intersection · Turning lanes · Vehicle activated signs · Improved intersection conspicuity · Advanced direction signage and warning · Improved sight distance · Traffic signals with fully controlled right turns · Skid resistance improvement · Improved street lighting.	E L L L L L L L L
Other considerations	· Speed cameras combined with red light cameras · Route planning to avoid unprotected right turns	L, S E

Harm Minimisation for Pedestrians

Section 7.1 of *Towards Safe System Infrastructure: A Compendium of Current Knowledge* [AP-R560-18] suggests a hierarchy of treatments that should be considered for pedestrians.

Table 7.1: Safe System Assessment Framework hierarchy of pedestrian related treatments

Hierarchy	Treatment	Influence (E = exposure L = likelihood S = severity)
Safe System options (‘primary’ or ‘transformational’ treatments)	· Separation (footpath) · Separation (crossing point) · Very low speed environment, especially at intersections or crossing points (30 km/h or less)	E L L, S
Supporting treatments (compatible with future implementation of Safe System options)	· Reduce speed environment/speed limit · Pedestrian refuge · Reduce traffic volume.	L, S L E, L
Supporting treatments (does not affect future implementation of Safe System options)	· Pedestrian signals · Skid resistance improvement · Improved sight distance to pedestrians · Improved lighting · Rest-on-red signals.	L L L L L, S
Other considerations	· Speed enforcement.	L, S

At some stage virtually everyone becomes a pedestrian whether they walk to work, drive a car, take public transport or ride a bike. There is a diversity of pedestrians including children, elderly, and those with temporary or permanent physical or mental disability. Pedestrians are vulnerable in the road system as they are unprotected, and their mass and speed is much lower than that of virtually all other road users. The Safe System aspires to interaction speeds of around 30 km/h where pedestrians are involved. Even then, there is still an elevated risk if the pedestrian is young or elderly or the striking vehicle is a heavy vehicle.

Harm Minimisation for Cyclists

Section 7.2 of *Towards Safe System Infrastructure: A Compendium of Current Knowledge* [AP-R560-18] suggests a hierarchy of treatments that should be considered for cyclists.

Table 7.2: Safe System Assessment Framework hierarchy of cycling related treatments

Hierarchy	Treatment	Influence (E = exposure L = likelihood S = severity)
Safe System options ('primary' or 'transformational' treatments)	· Separation (separate cyclist path) · Very low speed environment, especially at intersections (30 km/h or less)	E L, S
Supporting treatments (compatible with future implementation of Safe System options)	· Shared pedestrian/cyclist path · Cyclist lane (<50 km/h) · Reduce traffic volumes	E L E, L
Supporting treatments (does not affect future implementation of Safe System options)	· Separate cyclist signals at intersections · Cyclist box at intersections · Skid resistance improvement.	L L L
Other considerations	· Speed enforcement · Enforcement of other regulations.	L, S L

The role of Speed (and Mass) in Harm Minimisation

Section 4 of **Towards Safe System Infrastructure: A Compendium of Current Knowledge** [AP-R560-18] notes:

Speed is at the core of a forgiving road transport system. While many can relate to the physics of stopping associated with travelling speed, the intricate and non-linear relationship with crash energy and consequent injury is more difficult to appreciate.

The effect of a small travelling speed change into an injury outcome

A small change in travel speed

A relatively large change in stopping distance

A much larger change in impact speed

A still larger change in impact energy

A very large change in probability of death and serious injury

In this context, all aspects associated with speed are important. Even small reductions in travelling speed can have large effects on injury outcomes and the creation of an inherently safe road system is largely dependent on the kinetic energy in the system. The transition towards the Safe System will be dependent not only on the adoption of speed limits compatible with harm minimisation but also the integration of solutions that guarantee safe interaction speeds where conflict occurs.

Kinetic energy is the energy associated with the movement of an object and is determined by a combination of speed and mass such that:

$$E_k = \tfrac{1}{2} mv^2$$

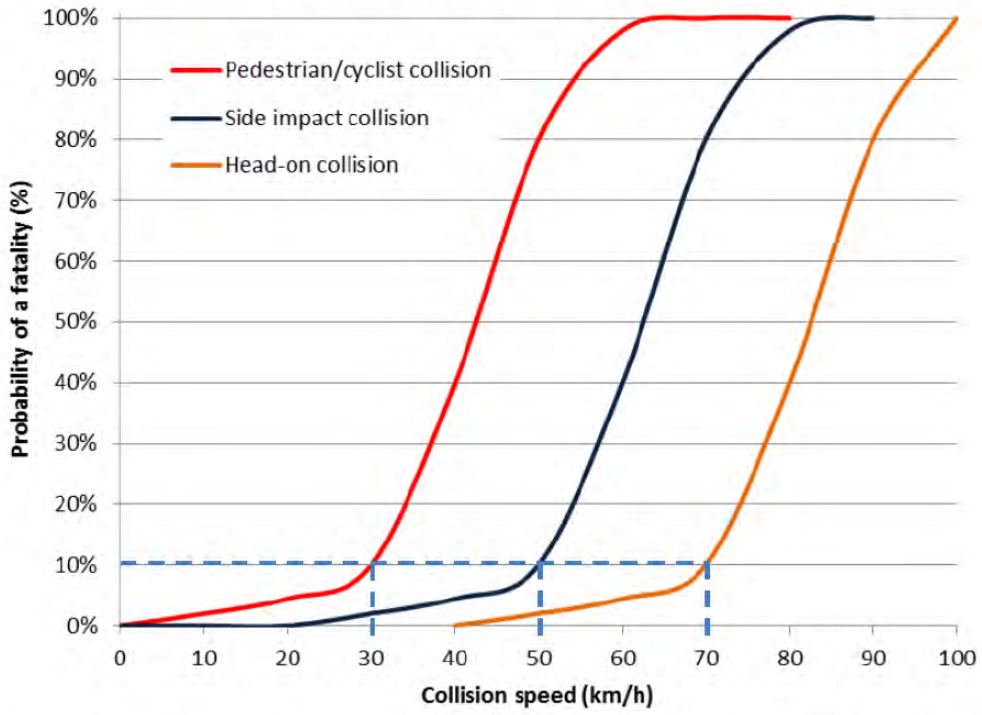
where E_k = kinetic energy (Joules), m = mass (kg) , v= velocity (m/s)

One of the reasons why the road network is inherently unsafe is because the main determinants of crash severity (i.e., speed and mass) are not compensated for when combining different road user groups together. Heavy vehicles provide a major Safe System challenge as one of the determinants of crash severity is mass. In many situations heavy vehicles operate at the same speeds as other vehicles in the network despite the large mass differentials that exist. This makes the task of mitigating death and serious injury outcomes difficult within existing parameters.

For conflicts between vehicles and unprotected road users (i.e., pedestrians, cyclists and motorcyclists), impact speeds should not exceed 30 km/h regardless of geometric layout, if pedestrian and cyclist risks of death are to remain below the nominated level of 10%.

Figure 4.8 [of [AP-R560-18] shows the curves adopted internationally to illustrate “survivable” thresholds against impact speeds. A 10% threshold for fatal outcomes was used as the basis for establishing a Safe System performance threshold.

Figure 4.8: Relationships between collision speed and probability of a fatality for different crash configurations



Source: Jurewicz, Sobhani et al. (2015) and based on Wramborg (2005)

wsp.com/nz

From: [redacted]
Sent: Tuesday, 4 April 2023 9:43 am
To: Don Young [redacted] Shane Binder [redacted]
Subject: FW: Rangiora potential cycleway route alternative crossings

Morning Don, Shane

Following on from our discussions and your email regarding a potential WDC Cycleways and KR land use in the Rangiora area.

KiwiRail is not adverse to such Projects –

- However to satisfy all Kiwirail and third party operational and Safety concerns.
  - We do have a definite process we use as a mechanism to manage the approval Process.
  - We have distributed this third party Process to you.

Time line of process

- In this current climate it is near impossible for us to offer up a time frame for the process, as it involves a number of our Engineering staff.
  - We could be talking years to complete – depending on what design or improvements are required.
- As mentioned KiwiRail have an extra ordinary work load on at the moment.
- This along with staffing shortage issues, as shared with a number of sectors of Industry.
- Our staff are currently prioritised to our highest priority Projects – ie Major Projects which are currently in flight, recovery from Cyclone Gabrielle and our RNIP work bank – "Rail Network Improvement Programme".
- Added to this a high number of Agencies and Community Projects who have received "Shovel ready Funding" or similar, who are also applying for similar projects to be carried out – placing additional strain on Professional teams.

Comments quoted - as raised by your councillors:

- Christchurch do have cycleways and crossings – which have been installed and still being installed after following the process.

We hope this gives you the information you require to inform your councillors .

Regards

[redacted] Senior Project Manager | Project Delivery Team | Capital Projects & Asset Development
MOB: [redacted]
14 Midas Place, Middleton, Christchurch 8024 | PB Box 6289 | Christchurch 8442 |New Zealand
KiwiRail

Hi [redacted]

I appreciate Shane has spoken to you about this, requesting some comment by Wed. I would re-iterate that this is really important for us to be able to properly advise our Councillors, who at this stage are wanting us to seriously look aty hese options. We appreciate that you cannot give a definitive reply in this short timeframe, but we would appreciate an indicative response.

Please note that our Councillors are raising the following comments also

- Christchurch seems to have a number of cycle crossings of the railway line (quoted as crossing many times in a short stretch in the Fendalton / Glandovey rd. area)
- Christchurch seems to have many cycleways within the 5m offset distance (again in the same stretch)

Some commentary to assist with this would also be helpful

(Note if you wish to discuss in more detail please call Shane or myself)

Regards

Don Young | Senior Engineering Advisor
Project Delivery Unit

Sent: Friday, 31 March 2023 10:10 AM
To: Shane Binder <[redacted]>
Cc: Don Young <[redacted]>
Subject: RE: Rangiora potential cycleway route alternative crossings

Caution: [THIS EMAIL IS FROM AN EXTERNAL SOURCE] DO NOT CLICK links or attachments unless you recognise the sender email address and know the content is safe.

Hi Shane

In order to progress this project – you would need to follow the KiwiRail 3rd Process to gain approvals and acceptance for it to go ahead.

I have attached the process for your information.

Once you have gathered your information – you would need to engage with our Properties team for approval of use of KR Land.

We can help you through the process once you are ready.

Kind

Regards

[redacted] Senior Project Manager | Project Delivery Team | Capital Projects & Asset Development
MOB: [redacted]
14 Midas Place, Middleton, Christchurch 8024 | PB Box 6289 | Christchurch 8442 |New Zealand
KiwiRail

From: Shane Binder <[redacted]>
Sent: Wednesday, 29 March 2023 2:01 pm
To: [redacted]
Cc: [redacted] Don Young <[redacted]>
Subject: Rangiora potential cycleway route alternative crossings

CAUTION EXTERNAL EMAIL: Do not click links or open attachments unless you know the content is safe.

Hello [redacted] As you're aware, we are working on a new Waka Kotahi (NZTA) funded cycleway in south Rangiora that will run along Railway Road and the west side of the main trunk line through Rangiora. We are working with Sahan Lalpe and Stantec to update the existing Marsh Road LCSIA to reflect the cycleway design as it becomes more refined.

Currently the Council have adopted a plan which includes a shared-use path along Railway Road, Torlesse St, Coronation St and to paper road alongside Southbrook Park (Ellis Rd). This route is displayed below in blue. We were recently requested by our Utilities and Roading Committee to consider the practicalities of several alternate routes that would cross the railway line and run up the east side.

In order to properly advise our Committee of your high-level thoughts on this matter, can you please provide your initial thoughts on the following alternatives:

1. [Orange route below] The shared-use path on the adopted plan would leave Railway Road and cross the railway at the existing Marsh Road crossing before turning north and paralleling the railway on the east side. We note about 12m from rail centreline to the boundary, so the sealed path would likely be at the far east side with barrier against the railway side. It would then cross the railway again at the existing Dunlops Road crossing before continuing north on Railway Road as part of the adopted plan.
2. [Purple route below] A sealed shared-use path would extend south along Lineside Road to cross the railway and carry north along the alignment of our future Rangiora Eastern Link road. The sealed path would traverse open paddocks to reach Marsh Road and then carry on west to the railway crossing and follow the Orange route as above.
    a. Note the first railway crossing at Lineside Road could be at one of two locations – either on the north side of the existing Lineside Rd / SH71 crossing, or at a new point just south of 636 Lineside Road:

3. [Green route below] A sealed shared-use path would leave Railway Road and cross the railway at the existing Marsh Road crossing before turning north in the future Rangiora Eastern Link alignment. A new sealed path would traverse the open paddocks north of Marsh Road until reaching Boys Road before turning west and crossing the railway at the existing Boys Road crossing.

From: [redacted]
Sent: Tuesday, 28 March 2023 5:38 PM
To: Don Young [redacted]
Subject: Farm land for cycleway

Caution: [THIS EMAIL IS FROM AN EXTERNAL SOURCE] DO NOT CLICK links or attachments unless you recognise the sender email address an

Hi Don

Thank you for your email regarding the cycleway.

In response to your enquiry, as much as we support the concept of cycleways, our view is that we do not believe establishing a cycleway through our farm is the best option. We make the following comments;

- The construction and use of the cycleway would be extremely disruptive to our farming operation.
- Cyclists going through the middle of our farm poses health and safety risks to our animals being spooked, associated risks to our staff, and risks to the public using the cycleway in case animals venture onto the cycle way.
- Our irrigators and farm machinery would also need to cross over the cycle way requiring major infrastructure changes and potential loss of farm productivity.
- Assuming our land is successfully re-zoned as requested in our submission to WDC, subdivision works will include earthworks of which the quantities/levels are not yet established. Any new cycleway through the farm land will be destroyed during subdivision works.
- The final layout of the subdivision is not yet known. Being constrained by a cycleway through the land will negatively impact the subdivision design process.
- It makes much more sense to include the cycle way as part of the proposed eastern link road when that is constructed, rather than duplicate costs of doing the job twice.

Regards
[redacted]

FW: Potential cycleway through Sparks Land

Don Young

To [redacted]

Cc

Reply | Reply All | Forward | ...

Mon 27/03/2023 3:03 PM

Good afternoon [redacted]

As briefly discussed on Friday, we have been requested by our Utilities and Roading Committee to consider the practicalities of installing a cycleway along the proposed designation through your property within the next year or so.

As background, the council has recently received additional funding from Waka Kotahi (NZTA) to install a number of cycleways and walkways. One of these is a proposed link from Lineside Rd towards the Rangiora CBD. One of the conditions relating to this funding is that it must be spent by June 2024, and so there is a tight timeframe for design and construction.

Currently the Council have adopted a plan which locates the alignment along Railway Road, Torlesse St, Coronation St and to paper Rd alongside Southbrook Park (Ellis Rd). However at a recent meeting the committee resolved for staff to consider alternative roues, including utilising the proposed Rangiora Eastern Link route through the proposed designation on your property.

In order to properly advise our Committee of your thoughts on this matter, can you please provide your initial thoughts on the following scenario

- A cycleway would be constructed along the proposed designation within the next 15 months.
- At this stage, assume it would traverse your property along the designation between Marsh Rd and Boys Rd
- It would be aligned within the designation as closely as possible to the intended long term alignment of a cycleway
- It would be a compacted gravel surface, largely constructed 'at grade' to prevent drainage run-off issues, with culverts required at each stream or drain location
- It would need fencing on both sides to separate cyclists from your ongoing farming operation
- Assume that there would be 1 or 2 locations where gates could be opened and closed to allow stock movements, while stopping the cyclists
- Assume that the Council would seek to negotiate a lease arrangement with you until such time as the full and final land transfer took place

Due to our timeframe, we would appreciate your response by COB Monday 3rd April

Thanks for your consideration

Regards

Don Young | Senior Engineering Advisor
Project Delivery Unit

	Adjacent Traffic / Road Volumes	Vehicle Entrance Conflicts	Intersection Conflict / Road Crossings	Rail Corridor	Parking Impacts	Connectivity	Programme Risk	Financial Risk	Reputational Risk	TOTAL SCORE
Option One Southbrook Road	3	4	4	1	3	1	3	3	3	**25**
	Adjacent to 25,000 VPD (1,200 heavy vehicles)	19 commercial vehicle entrances to cross	three significant intersections to cross (Flaxton Rd has 7,462 VPD with 590 heavy vehicles. Todds Rd has 1,362 VPD with 227 heavy vehicles)	no conflict with rail corridor	An on-road facility will require removal of on-street car parking spaces	Provides good connectivity to Southbrook business area, Southbrook park, and two schools, and direct route to Rangiora Town Centre	Unlikely to be supported by Waka Kotahi, resulting in delays and loss of funding	Unlikely to be supported by Waka Kotahi, resulting in delays and loss of funding	Goes against community feedback during previous CNP consultation	
Option Two Southbrook Road & Ellis Road	4	3	4	1	3	1	3	3	3	**25**
	Adjacent to 15,000 VPD (1,296 heavy vehicles) on Lineside Road, then sharing Ellis Road with commercial activities	11 commercial vehicle entrances to cross	two significant intersections to cross (Flaxton Rd has 7,462 VPD with 590 heavy vehicles. Todds Rd has 1,362 VPD with 227 heavy vehicles)	no conflict with rail corridor	An on-road facility will require removal of on-street car parking spaces	Provides good connectivity to Southbrook business area, Southbrook park, and two schools, and direct route to Rangiora Town Centre	Unlikely to be supported by Waka Kotahi, resulting in delays and loss of funding	Unlikely to be supported by Waka Kotahi, resulting in delays and loss of funding	Goes against community feedback during previous CNP consultation	
Option Three Southbrook Road through McAlpines Mitre 10 (alongside South Brook)	3	3	4	1	3	1	4	4	4	**27**
	Adjacent to 25,000 VPD (1,200 heavy vehicles)	11 commercial vehicle entrances to cross	three significant intersections to cross (Flaxton Rd has 7,462 VPD with 590 heavy vehicles. Todds Rd has 1,362 VPD with 227 heavy vehicles)	no conflict with rail corridor	An on-road facility will require removal of on-street car parking spaces	Provides good connectivity to Southbrook business area, Southbrook park, and two schools, and direct route to Rangiora Town Centre	Requies a signifcant land purchase from McAlpines Mitre 10 who have previously signalled that they are not in favour of this option	Requies a signifcant land purchase from McAlpines Mitre 10 who have previously signalled that they are not in favour of this option	Requies a signifcant land purchase from McAlpines Mitre 10 who have previously signalled that they are not in favour of this option	
Option Four Railway Road (Previously recommended option)	1	1	2	3	1	2	1	1	1	**13**
	Railway Road has low traffic volumes of 875 vehicles per day (97 heavy vehicles)	Only 5 commercial vehicle entrances to cross. None of these high volume	Requires crossing of the Marsh Rd intersection, that has low volumes of 216 vehicles per day	Alignment adjacent to the rail corridor	loss of two on-street parking spaces to make way for street trees	Provides good connectivity to Southbrook business area, Southbrook park, and two schools	Approved by Waka Kotahi	Approved by Waka Kotahi	Approved within existing CNP	
Option Five Railway Road, and Eastern side of Rail Corridor	1	1	3	4	1	2	3	2	1	**17**
	Railway Road has low traffic volumes of 875 vehicles per day (97 heavy vehicles)	Only 5 commercial vehicle entrances to cross. None of these high volume	Requires crossing of the Marsh Rd intersection, that has low volumes of 216 vehicles per day, however also requires users to mix with traffic within the level crossing	Requires users to cross two level crossings	loss of two on-street parking spaces to make way for street trees	Provides good connectivity to Southbrook business area, Southbrook park, and two schools	Approved by Waka Kotahi, unlikely to gain KiwiRail approval	Approved by Waka Kotahi, requires new bridge structure within this alignment	Can be accommodated within existing CNP	
Option Six Eastern Link Alignment (MARSH RD TO BOYS RD)	1	3	3	4	2	3	4	4	3	**27**
	Railway Road has low traffic volumes of 875 vehicles per day (97 heavy vehicles)	Only 5 commercial vehicle entrances to cross. None of these high volume. New facility would be required on South Belt with many vehicle entrances	Requires crossing of the Marsh Rd intersection, that has low volumes of 216 vehicles per day, however also requires users to mix with traffic within the level crossing	Requires users to cross two level crossings; the complex Marsh Rd crossing, and the Boys Rd level crossing	Would likely require parking loss along South Belt to facilitate a safe cycleway to connect to King Street.	Good connectivity to eastern Rangiora, however will result in missing links on Network plan, and no connectivity to Southbrook destinations.	Requires substantial land purchase, installation of bridges	Unlikely to be supported by Waka Kotahi, resulting in delays and loss of funding	Goes against community feedback during previous CNP consultation	
Option Seven Eastern Link Alignment (Lineside to Marsh)	1	1	1	4	1	3	3	3	2	**19**
	Avoids Railway Road (until Dunlops Rd)	Avoids the 5 commercial vehiclee entrances of Railway Rd	Requries the crossing of Marsh Rd, that has a low ADT of 216 vehicles per day	Requires users to cross two level crossings; one at Lineside Road, and the other at Dunlops Road.	No parking loss	Requires path users to take a longer, less direct route to link back into Railway Rd at Dunlops Rd	Unlikely to gain KiwiRail approval for two level crossings, and construction of path and bridge within KiwiRail corridor.	Unlikely to be supported by Waka Kotahi, resulting in delays and loss of funding. Increased cost due to kiwirail requirements, and two new bridges (one in Water Unit Yard, and one in rail corridor)	Goes against community feedback, however links back into approved plan at Dunlops Rd	

Kieran Straw

From: Kalley Simpson
Sent: Monday, 3 April 2023 8:35 AM
To: Kieran Straw
Cc: Joshua McIndoe
Subject: RE: Potential Cycleway through Water Unit Property
Attachments: Atatchment ii - Rangiora WWTP Potential Future Layout Plan.PDF

Hi Kieran

You will be aware of the masterplan for this site, which has previously been through U&R (refer attached).

In addition to this, there is also the stormwater swale and screening bunds which have asbestos in, located near the alignment of the cycleway. These would need to be avoided / worked around in the actual alignment take.

There have been a few enquiries from other department regarding the small parcel of land to the north of the South Brook. You should check with the Property team to see if any of the these are being progressed.

Hope this helps.

Regards
Kalley

Kalley Simpson | 3 Waters Manager
3 Waters

Phone: 0800 965 468 (0800 WMK GOV)
[redacted]
DDI: [redacted]

WAIMAKARIRI DISTRICT COUNCIL

waimakariri.govt.nz

From: Kieran Straw [redacted]
Sent: Friday, 31 March 2023 9:36 AM
To: Kalley Simpson <[redacted]
Cc: Joshua McIndoe <[redacted]
Subject: Potential Cycleway through Water Unit Property

Hi Kalley,

As Joshua is away on leave until next week, you may be in a position to provide comment.

Ayou may be aware, Council adopted a Walking and Cycling Network Plan in October 2022. Council has recently received additional funding from Waka Kotahi (NZTA) to install a number of cycleways and walkways. One of these is a proposed link from Lineside Rd towards the Rangiora CBD. At the recent Utilities & Roading Committee meeting, the proposed scheme design and alignment using Railway Road was declined due to insufficient information and concerns from Pak n Save. We (the WDC project Team) were then asked to consider alternative routes. One of these was to consider the installation of the cycleway along part, or all of the route of the proposed Rangiora Eastern Link Road Designation that passes through the water unit.

However rather than propose to install the cycleway through the operation portion of the property, staff would like to seek you comment on the feasibility of installing the cycleway roughly along the orange alignment shown on the snip below. If you could provide comment on the feasibility of this, any impacts this may have with the future of the site, the upcoming 3 waters reform, site contamination, security etc that would be much appreciated . If Council were to adopt this route, we would be looking to construct prior to June 2024. It is a tight timeframe we are working to, and we are going back to the Utilities and Roading Committee in April. We therefore require your feedback prior to 5th April when the upcoming agenda closes.

Thanks,

Kieran Straw | Civil Projects Team Leader
Project Delivery Unit

Phone: 0800 965 468 (0800 WMK GOV)
Mobile: [redacted]
DDI: +6432669274

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR DECISION

FILE NO and TRIM NO:	DRA-20-26 / 230404047292
REPORT TO:	Utilities and Roading Committee
DATE OF MEETING:	18 April 2023
FROM:	Claudia Button, Project Engineer Jason Recker, Stormwater and Drainage Manager
SUBJECT:	East Belt Rain Gardens
SIGNED BY: **(for Reports to Council, Committees or Boards)**	General Manager Utilities and Roading Chief Executive

1. SUMMARY

1.1. The purpose of this report is to update the Utilities and Roading Committee regarding the proposed East Belt Rain Gardens project in Rangiora and gain approval to proceed with the concept design.

1.2. Regular flooding at the intersection of East Belt and Keir Street in Rangiora has prompted the need for improved stormwater management near Rangiora High School and along East Belt. A new soak pit near the corner of Keir Street and East Belt was constructed in 2020 to aid with the volume of runoff, however further opportunities to soak runoff to ground require implementation to improve the regular flooding experienced on East Belt.

1.3. During the June 2022 flood events, Council received a service request stating that there was flooding across East Belt (DR2200907). Improvements suggested to be undertaken with the East Belt Rain Gardens project are to help alleviate downstream flooding as much as practical, rather than meet level of service requirements as per the Waimakariri District Council Engineering Code of Practice. This is due to the area of land required to construct a rain garden that is sized to treat first flush run off and/or dispose to ground a 1 in 5 year design rain event.

1.4. The East Belt Rain Gardens conceptual design has been finalised based on initial design ideas from the conceptual and high level cost estimate report (TRIM 201002131418), addendum to concept design memo (TRIM 211101175363). A workshop was held in March 2022 with Council staff and Stormwater Engineer Peter Christensen which informed the finalised conceptual design (TRIM 230403046730).

1.5. The current budget available for the upgrade is funded by the East Belt Rain Gardens & Soakpit budget (PJ 101349.000.5123):

- 2022/23 financial year - $90,000 – soak pit, multi stage conceptual design development, detailed design, and tender document preparation for rain gardens (includes carryover from previous years)
- 2023/24 financial year - $210,000 – construction of rain gardens, and PDU construction management fees

1.6. A high level budget estimate has been prepared in Section 6.1 to reflect the design based on the cost estimations made when the initial cost estimate was undertaken. This

demonstrates the construction fees are 3% greater than the available budget. During detailed design the cost estimate will be refined based on the affordable design that ensures value for money.

Table 1. Financial summary for East Belt Rain Gardens Project

Financial Year	Budget	Engineer's Estimate
2022/23	$90,000*	$90,000*
2023/24	$210,000	$215,500
Total	**$300,000**	**$305,500**

*includes carryover

Attachments:

i. Conceptual Design and High Level Cost Estimate (TRIM 201002131418)

ii. Addendum to Concept Memo (TRIM 211101175363)

iii. Finalised Conceptual Design Memo (TRIM 230403046730)

2. RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 230404047292.

(b) **Approves** the finalised concept design to be progressed to detailed design and construction in the 2023/24 financial year.

(c) **Notes** that the high level cost estimate is 3% over the available budget, however through the detailed design process the design and engineer's estimate will be refined to ensure the project is within budget.

(d) **Notes** that the cost estimate will be further refined during detailed design with recent tendered rates and a reflection of the extent of the design that can be included within these rates.

(e) **Circulates** report No. 230404047292 to the Rangiora-Ashley Community Board for information.

3. BACKGROUND

3.1. Regular flooding at the intersection of East Belt and Keir Street in Rangiora has prompted the need for improved stormwater management near Rangiora High School and along East Belt. A new soak pit near the corner of Keir Street and East Belt was constructed in 2020 to aid with the volume of runoff, although further areas for infiltrating runoff to ground is required to improve the flooding on East Belt.

3.1 The scope was revised to capture and treat as much runoff as possible using the existing garden areas, rather than catering for a specific return period design storm as required by the Waimakariri District Council (WDC) Engineering Code of Practice (ECoP). The focus area is near Rangiora High School due to the learning opportunity for students at Rangiora High School. The project manager has been in contact with the school's Business Manager about Council's planned works and what benefits this could have for the students understanding of the implications of stormwater runoff. Water sensitive urban design (WSUD) has been a primary focus for the solution, and multiple types of WSUD have been considered.

4. ISSUES AND OPTIONS

4.1. East Belt has a history of regular flooding during large rain events. Council has installed a soak pit at the corner of Kier Street and East Belt in 2020 to assist with soaking away ponding stormwater. Further stormwater improvements are required to reduce flooding further.

4.2. Conceptual design based on the WDC ECoP was unaffordable and not practical to construct due to the ratio of impervious area to available land to soak water away. Based on this, the existing garden areas by Rangiora High School are to be retrofitted into rain gardens and expanded where possible and as budget allows. This is an interim flooding mitigation measure to improve flooding as far as practical by infiltrating water to ground upstream from where ponding occurs.

4.3. The scope of works has been separated into three sections: upper, mid and lower. Improvements to be made consist of retrofitting rain gardens, sediment grooves to trap sediment upstream of the rain gardens, and replicating the look of a rain garden in most eastern sided gardens due to major service clashes expected within the excavation area. Refer to the simple mark up of finalised conceptual design improvements to be implemented in each section in Figure 1, Figure 2 and Figure 3, refer to Attachment iii for more information.

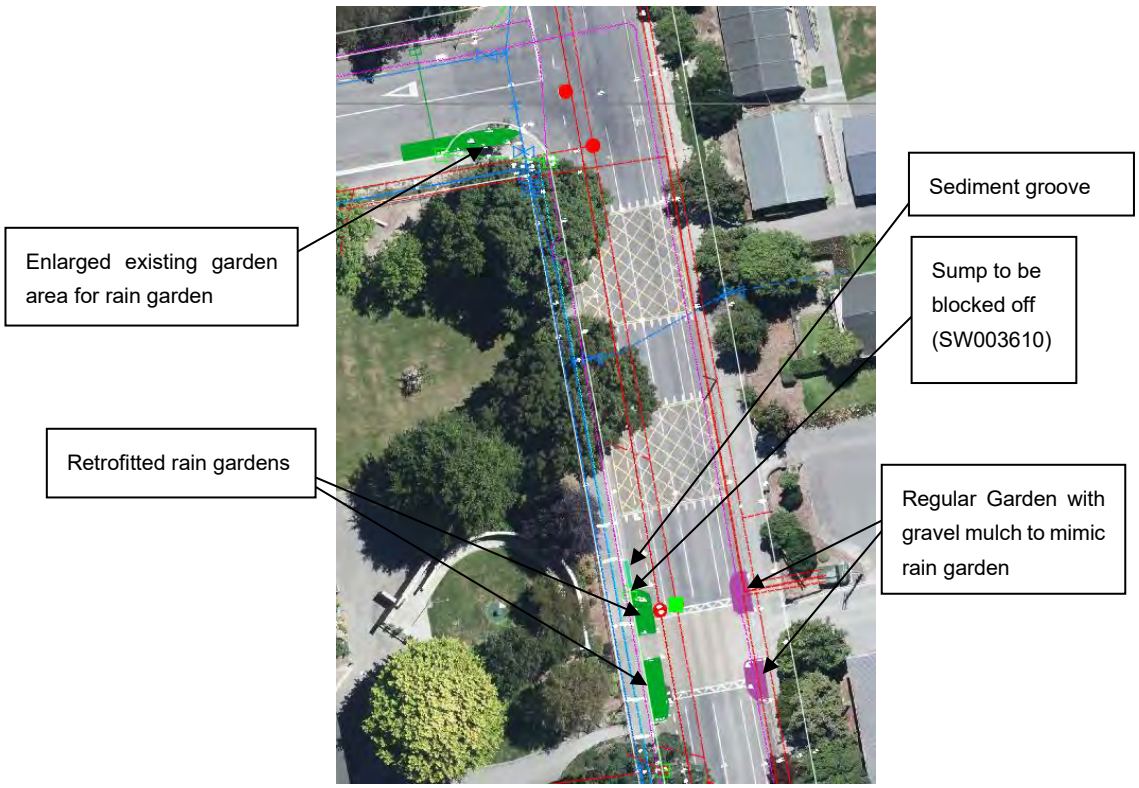


Figure 1. Upper section upgrades (Wales Street / East Belt Intersection)

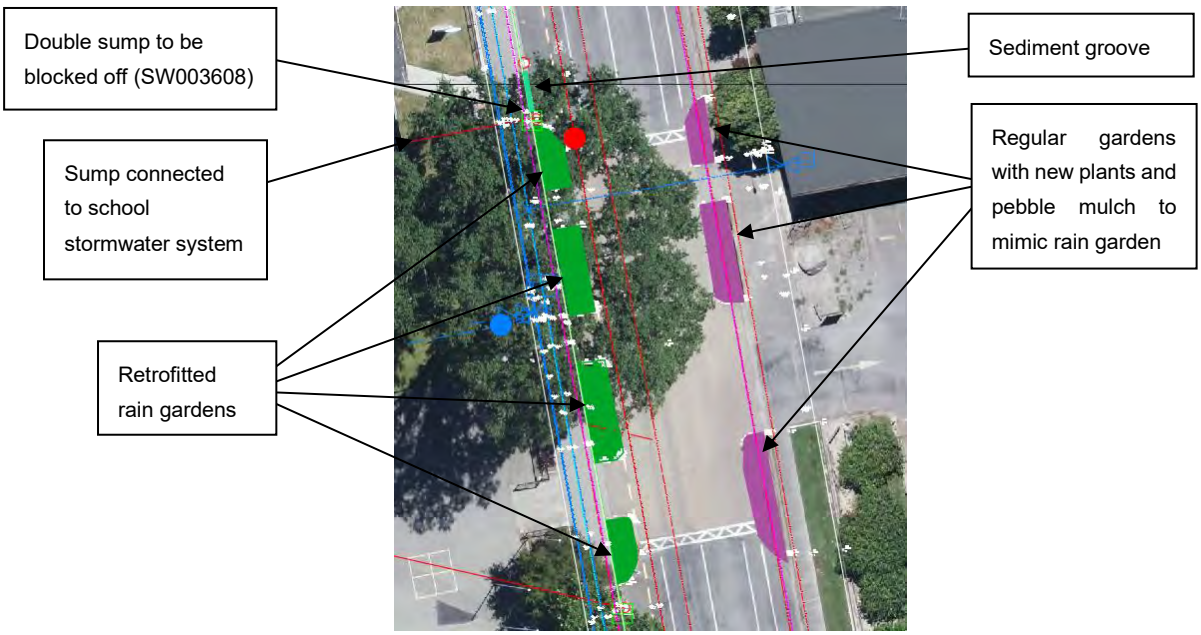


Figure 2. Mid-section upgrades (East Belt, near school gymnasium)

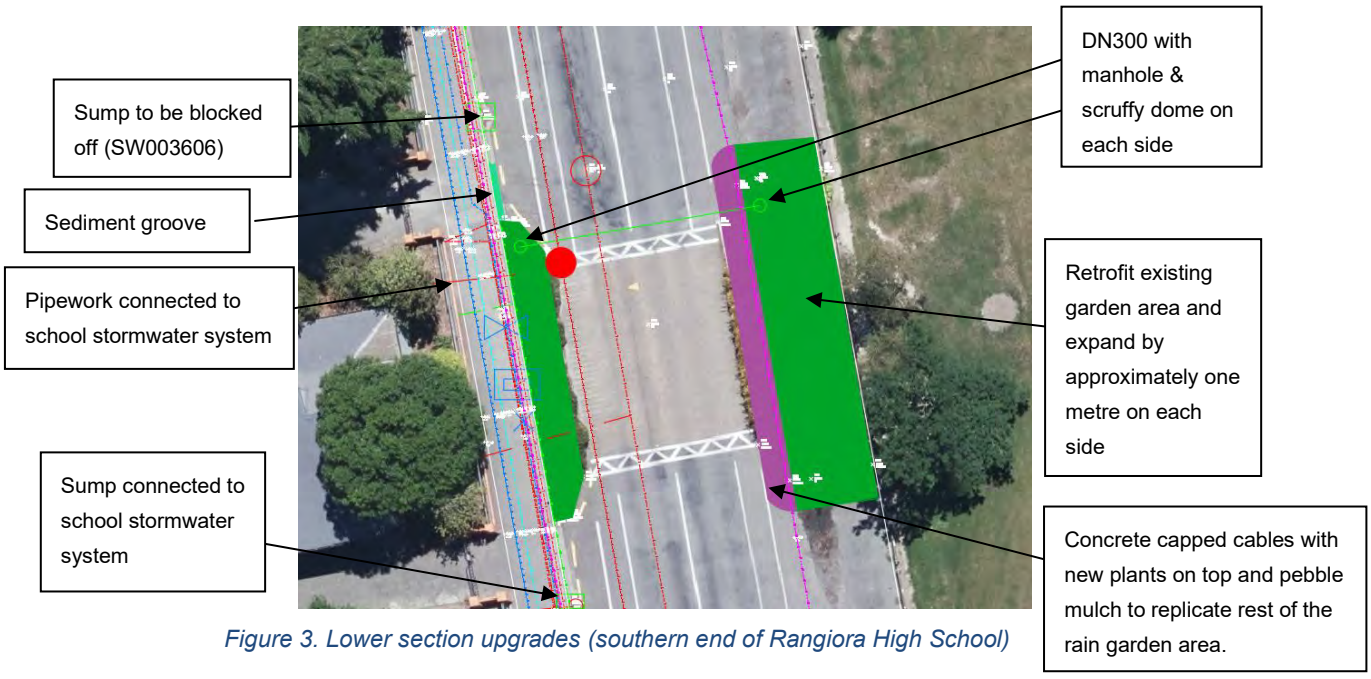


Figure 3. Lower section upgrades (southern end of Rangiora High School)

4.4. In the future when land to the east is developed, there will be a transport link which will provide the long term solution to the flooding issues on East Belt.

4.5. The Management Team have reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana Whenua

Te Ngāi Tūāhuriri hapū may have an interest in this project. Council did not receive a response from the preliminary notification of works notice. This project will be included on

the list of projects presented to Te Ngāi Tūāhuriri, once we have an understanding of whether or not a WDC earthworks consent is required.

5.2. Groups and Organisations

5.2.1. Rangiora High School have been communicated with in the earlier stages of the conceptual design and are supportive of Council implementing rain gardens in the existing garden areas nearby the school. Rangiora High School will be consulted with on the detailed design to ensure there is minimal impacts to buses and students access to the school facilities on either side of East Belt.

5.2.2. Waters and Farr are another large impervious site contributing to the flooding being experienced on East Belt. The project manager of East Belt Rain Gardens will engage with them on detailed design to see if they would consider on-site stormwater mitigation measures to help alleviate flooding downstream.

5.3. Wider Community

5.3.1. No public consultation has been carried out in relation to the proposed stormwater upgrades.

6. IMPLICATIONS AND RISKS

6.1. Financial Implications

6.1.1. The East Belt Rain Gardens project is funded by the East Belt Rain Gardens & Soakpit budget (PJ 101349.000.5123). The engineer's cost estimate for professional fees and construction costs versus the available budget for respective years is shown in Table 1 below.

Table 2. Financial summary for East Belt Rain Gardens Project

Financial Year	Budget	Engineer's Estimate
2022/23	$90,000*	$90,000*
2023/24	$210,000	$215,500
Total	**$300,000**	**$305,500**

*includes carryover

6.2. Sustainability and Climate Change Impacts

6.2.1. The recommendations in this report do have sustainability and/or climate change impacts. By infiltrating stormwater to ground upstream of where there is ponding, there will be less stormwater flooding East Belt during large rain events as experienced in previous events. With the likelihood of greater intensity rain events occurring in the future, these works will help during rain events that overwhelm the primary stormwater reticulation network. It is necessary to infiltrate and treat stormwater prior to discharging to ground. The Rain Garden media to be specified in detailed design has the correct mix of compost, sand and topsoil to filter contaminants in the stormwater.

6.3. Community Implications

6.3.1. The upgrade of the stormwater system will improve the level of service for residents who traverse along East Belt, as there should be less flooding on the road carriageway during rain events.

6.3.2. Depending on the finalised size of the rain gardens that are to be expanded, there may be some car parks impacted. This has been discussed with Rangiora High School who are supportive of this.

6.4. Risk Management

6.4.1. A safety in design workshop will be held to assess, mitigate and/or eliminate any potential health and safety risks introduced to the area because of the works. Specific consideration should be given to depth of ponding within each rain garden given the proximity to the school and volume of foot traffic in the area.

6.4.2. The High Level Budget Estimate has been developed from average tendered rates in the past and includes 10% professional fees, and 25% construction contingency which should reduce the risk of funding shortfall. The detailed design cost estimate will further refine the cost of works to be completed. There is also flexibility to strategize where rain gardens are constructed compared to regular gardens mimicking the look of the rain gardens. This can be achieved by using pebble mulch and same plant species at the surface of the garden, when regular garden soil is underneath (not rain garden media etc.).

6.4.3. It should be noted that the proposed upgrade only improves flooding as far as practical, and works to be completed do not meet the WDC ECoP.

6.4.4. An environmental assessment has been undertaken by PDU staff, which concluded that the works do not require an Environment Canterbury resource consent as the new assets can be managed as part of the reticulated stormwater network in Rangiora under resource consent CRC184601. The risk of not being awarded a resource consent is not applicable for this project.

6.4.5. Depending on the earthworks volume, a WDC resource consent may be required. This is low risk due to adequate processing timeframes between the detailed design estimated completion date (May 2023) and construction period (summer 2023/24), should a resource consent be necessary.

6.5. Health and Safety

6.5.1. The project will be tendered in accordance with Council Procurement Policy using an Open Tender process. A procurement plan will be submitted to the Procurement PCG for approval, however at this stage it is proposed that the tender will be assessed using a Price Quality method and will require tenderers to provide relevant experience, a detailed methodology, programme and draft traffic management plans which will be assessed as part of their non-price tender submission. The successful tenderer will be required to provide a site specific health and safety plan for acceptance prior to the works commencing.

7. CONTEXT

7.1. Consistency with Policy

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. Authorising Legislation

The Local Government Act is relevant to this matter.

7.3. Community Outcomes

The Councils community outcomes are relevant to the actions arising from recommendations in this report.

7.3.1. Environment

- There is a safe environment for all.
- There is sufficient clean water to meet the needs of communities and ecosystems.
- The air and land is healthy.

7.3.2. Places and Spaces

- Public spaces and facilities are plentiful, accessible and high quality.
- There are areas of significant indigenous vegetation and habitat for indigenous fauna.

7.3.3. Services

- Core utility services are provided in a timely and sustainable manner.
- People have wide-ranging opportunities for learning and be being informed.

7.4. Delegations

7.4.1. The Utilities and Roading Committee have delegation to receive this report and approve the proposed concept for progression to detailed design and construction.

WAIMAKARIRI DISTRICT COUNCIL

MEMO

FILE NO AND TRIM NO:	DRA-20-26/ 201002131418
YOUR REF:	PD001706
DATE:	02 October 2020
MEMO TO:	Kalley Simpson, 3 Waters Manager
FROM:	Claudia Button, Graduate Engineer
SUBJECT:	East Belt Rain Gardens – Concept Design and High Level Costs

1. BACKGROUND

Regular flooding at the intersection of East Belt and Keir Street in Rangiora has prompted the need for improved stormwater management near Rangiora High School and along East Belt. A new soak pit near the corner of Keir Street and East Belt has been constructed recently to aid with the volume of runoff, although currently only primary treatment in the form of sumps is provided at this location.

A previous investigation carried out by Beca (TRIM 190920132228) concluded that converting current roadside gardens along East Belt to rain gardens will only be useful during day to day rain events. Soakage tests were carried out by Beca (TRIM 190624088790) which proved there is potential for soakage systems to function effectively in the vicinity of East Belt with soakage rates ranging from 120 mm/hr to 300 mm/hr.

This memo will cover the investigation and development of conceptual options for stormwater management along East Belt. The brief identifies that intent of the project is to treat run-off from a 1 in 2 year storm and potentially dispose to ground up to and including the 1 in 5 year storm in order to reduce the risk of flooding at the intersection of Keir Street and East Belt during a 1 in 5 year storm.

Additionally, the possibility of treating the first 10 mm and 25 mm of first flush has been considered. However the resulting volumes are significantly larger than the critical duration 1 in 2 and 1 in 5 year storm events and as such are unlikely to be viable to treat and dispose to ground.

2. CATCHMENT

The catchment of interest is along East Belt, between Wales Street and Keir Street. Within the catchment is Rangiora High School, Rangiora Baptist Church, Hope Centre, Baptist cemetery, Presbyterian cemetery, Methodist cemetery, residential housing and Waters & Farr (pipe suppling business). The total catchment was broken into 16 sub-catchments to determine where the flow may be introduced into the kerb and channel on East Belt, see Figure 8.

Figure 1. Sub-catchments

The rational method was used to calculate the peak runoff flows and volumes. As the total catchment was divided into smaller sub-catchments, the time of concentration ranges from 10 minutes to 2 hours depending on the ground cover and area size. Table 1 shows the rainfall intensities for the range of storm durations for the 1 in 2 year and 1 in 5 year storms in Rangiora.

Table 1. Rainfall intensities for RCP8.5 scenario for period 2081-2100

Storm duration	RAINFALL INTENSITIES (mm/hr)				
	10 minutes	20 minutes	30 minutes	1 hour	2 hours
1 in 2 year	33.6	23.1	18.9	13.6	9.85
1 in 5 year	51.2	34.8	28.2	20	14.3

In accordance with the brief treatment of the run-off resulting from the 1 in 2 year storm event was used when evaluating treatment options.

3. TREATMENT OPTIONS

Rain Gardens

Christchurch City Council's rain garden, design and construction manual was used as a basis for treatment calculations. The recommended design infiltration rate of 30 mm/hr and an extended detention depth above the rain garden filter of 300 mm was assumed. It was assumed that any stormwater that passes through the rain gardens will be disposed to ground, instead of re-entering the stormwater system. This is because Beca's infiltration testing report indicated higher infiltration rates than 30 mm/hr once gravels are reached.

Proprietary devices

A proprietary device is a premade piece of infrastructure that provides treatment to stormwater runoff. There are multiple devices on the market which provide varying levels of treatment. Devices commonly used in the district and considered in this memo are shown in Table 2. Flow rates from the 1 in 2 year storm calculations were used to size the required treatment devices for the sub-catchments.

Table 2. Potential treatment devices

DEVICE	TREATMENT	FLOW CAPACITY	SUPPLY ONLY COST
Jellyfish membrane (8-12 54" cartridge filter)	Floatables, litter, oil, debris, TSS, silt-sized articles (2 microns), particulate bound pollutants (phosphorous, nitrogen, metals and hydrocarbons)	5 L/s/cartridge → 60 L/s per 12 cartridge unit	$110k
Vortcapture (VC60, VC70, VC80, VC100)	Litter, debris and sediment greater than 5 mm	51 L/s, 80 L/s, 115 L/s, 204 L/s	$10k, $12k, $16k, $24k
Cascade separator (CS2, CS4, CS6, CS8)	Sediment capture and retention, removal of hydrocarbons, litter, debris.	109 L/s, 185 L/s, 283 L/s, 411 L/s	$28k, $33k, $45k, project dependent

Other proprietary device options that could be considered further are:

- Filterra (Stormwater360)
- Sand filter (Hynds)

Other Water Sensitive Urban Design Options

Permeable Pavement – foot paths, parking areas and roads.

- Stormwater360 grasscrete
- Design own using Auckland City Councils permeable pavement construction guide.

Soakage Swale

- Construct a formal soakage swale along the west side of East Belt to assist infiltration before reaching the new soak pit.

4. ISSUES

The catchment has multiple constraints that were considered as shown in Table 3.

Table 3. Constraints associated with nearby properties

LOCATION	CONSTRAINTS

Rangiora High School	• Students
	• Car parking
	  o Rangiora High has limited onsite parking available, so assumed roadside was utilised to a high capacity
	• Bus parking
	• Bus manuvering area
	• Sport facilities on road parking requirements
	  o Basketball
	  o Netball
	  o Soccer
	  o Rugby

Baptist Church and Hope Centre	Some roadside parking needed, the Baptist Church has a large car parking area available
Baptist, Presbyterian and Methodist cemeteries	Visitors park on the road side, otherwise potentially in the Baptist Church Car Park
Waters & Farr	Plastic pipes company who use large transport trucks entering and leaving the site via the entrance on Keir Street
Artisan Bakery	Exit from deliveries section onto Keir Street. Assumed large trucks are involved in this operation.
Overall catchment	The majority of the runoff is from the west side of the road catchments where there is limited capacity to infiltrate stormwater to ground. The east side has more opportunity to infiltrate stormwater to ground so a conveyance system across East Belt will be required.

Review of the catchment identifies that the existing parking is frequently fully utilised and any reduction in parking bays is likely to encounter significant community pushback.

5. OPTIONS CONSIDERED

Four options were considered for treatment of the stormwater and are as follows:

1. **Retrofitting roadside gardens (and enlarging as required) to be treatment at source style rain gardens**

Figure 2 to Figure 7**Error! Reference source not found.** demonstrate the storage capacity of the existing vegetated areas on Wales Street, East Belt and Keir Street, the runoff volume for the relevant catchments for four scenarios: 25 mm first flush from impermeable surfaces, 10 mm first flush from impermeable surfaces, 1 in 2 year storm event and 1 in 5 year storm event, and the required area to treat runoff volumes using rain gardens.

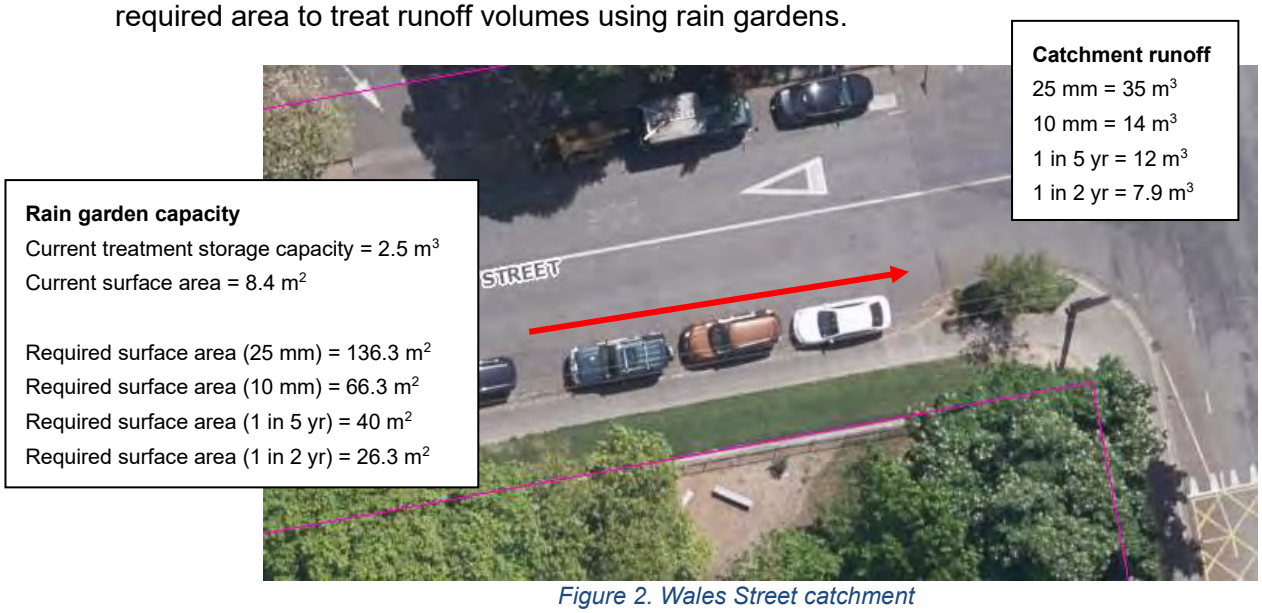


Figure 2. Wales Street catchment

A rain garden at the intersection of Wales Street and East Belt would capture flow from the Wales Street road reserve. The existing planted area is reasonably small and would require enlarging to 26.3 m^2 in order to provide treatment for the critical duration 1 in 2 year event. For disposal of the difference between the 1 in 2 and 1 in 5 year critical duration events (assuming 120 mm/hr infiltration for disposal) a rapid infiltration chamber with approximate volume of 4.6 m^3 would be required. It is assumed that the rapid infiltration chamber would be constructed underneath the raingarden with sufficient vertical separation. Enlarging the existing raingarden to provide the required treatment area would result in the loss of approximately one parking space.

Catchment runoff
25 mm = 40 m^3
10 mm = 16 m^3
1 in 5 yr = 6.6 m^3
1 in 2 yr = 4.4 m^3

Rain gardens
Combined treatment storage capacity = 11.2 m^3
Combined current surface area = 37.4 m^2

Required treatment surface area (25 mm) = 133.4 m^2
Required treatment surface area (10 mm) = 53.3 m^2
Required treatment surface area (1 in 5 yr) = 22 m^2
Required treatment surface area (1 in 2 yr) = 14.7 m^2

Figure 3. North Eastern catchment rain garden capacity

Rain gardens along the eastern side of East Belt near the school would capture flow from the road reserve sub-catchments shown in pink and light blue in Figure 1. There is excess capacity on the eastern side to treat and dispose of run-off resulting from both the 1 in 2 and 1 in 5 year storm events.

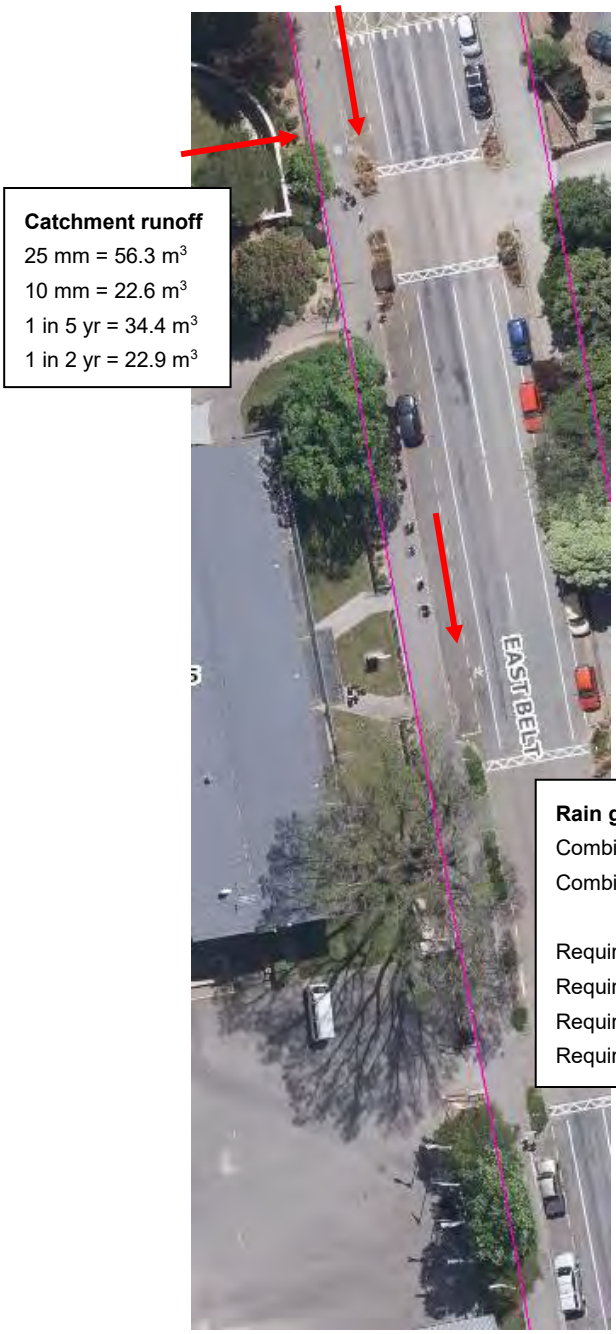


Figure 4. North Western catchment rain garden capacity

Assuming the upstream rain garden in Figure 2 were enlarged the rain gardens along the western side of East Belt would capture flow from the road reserve and dark blue sub-catchment in Figure 1.

The existing planted areas are small and would require enlarging to approximately twice the size in order to provide treatment for the 1 in 2 year storm event. For disposal of the 1 in 5 year storm event, assuming 120 mm/hr infiltration for disposal, rapid infiltration chambers with larger plan view areas to the existing garden areas would be required.

As this side of East Belt is used by school buses it is not viable to increase the size of the existing gardens to twice the size. Therefore in order to provide the required treatment an alternative/supplementary treatment mechanism would be required.

Although enlarged rain gardens might not be viable to treatment the flow resulting from the 1 in 2 year storm event, consideration was given to linking the disposal systems on the east and western catchments shown in Figures 3 and 4 to dispose of flows from the 1 in 5 year event.

Whilst not fully addressing the shortfall in treatment capacity it should provide disposal capacity for the 1 in 5 year event assuming an infiltration rate of 120mm/hr and multiple cross-linked soak pits with a combined volume of approximately 17m^3.

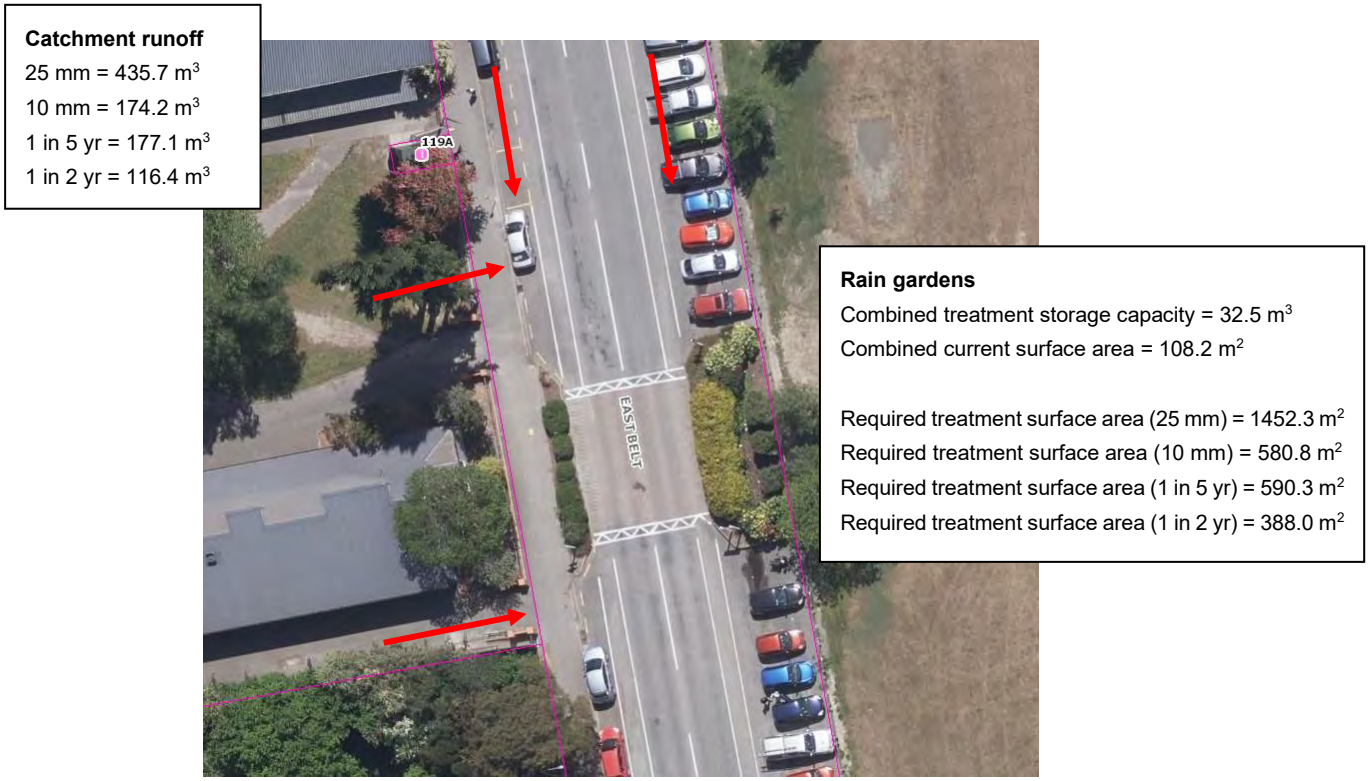


Figure 5. Mid catchment

The rain gardens next to the southern end of the school on East Belt would capture flow from the road reserves. It is assumed that up to and including the 1 in 5 year storm event there is no additional run-off from the upstream catchments as defined in Figures 2, 3 and 4. The existing planted areas would need to be enlarged by a factor of four in order to provide treatment for the 1 in 2 year event. For disposal of the 1 in 5 (assuming 120 mm/hr infiltration for disposal) a cross-linked rapid infiltration chamber with a combined volume of approximately 150m^3 would be required.

It is not viable to increase the size of the rain gardens in this area by approximately four due to the high demand for car parking spaces in the area. Therefore in order to provide the required treatment an alternative/supplementary treatment mechanism would be required. Similarly if an alternative mechanism for treatment were preferred the volume of the disposal system would require increasing as the attenuation capacity of the raingarden would not be available. This would likely result in a significant proportion of the parking area on the eastern side of the road being used for disposal or flows passed forward to the downstream catchment.

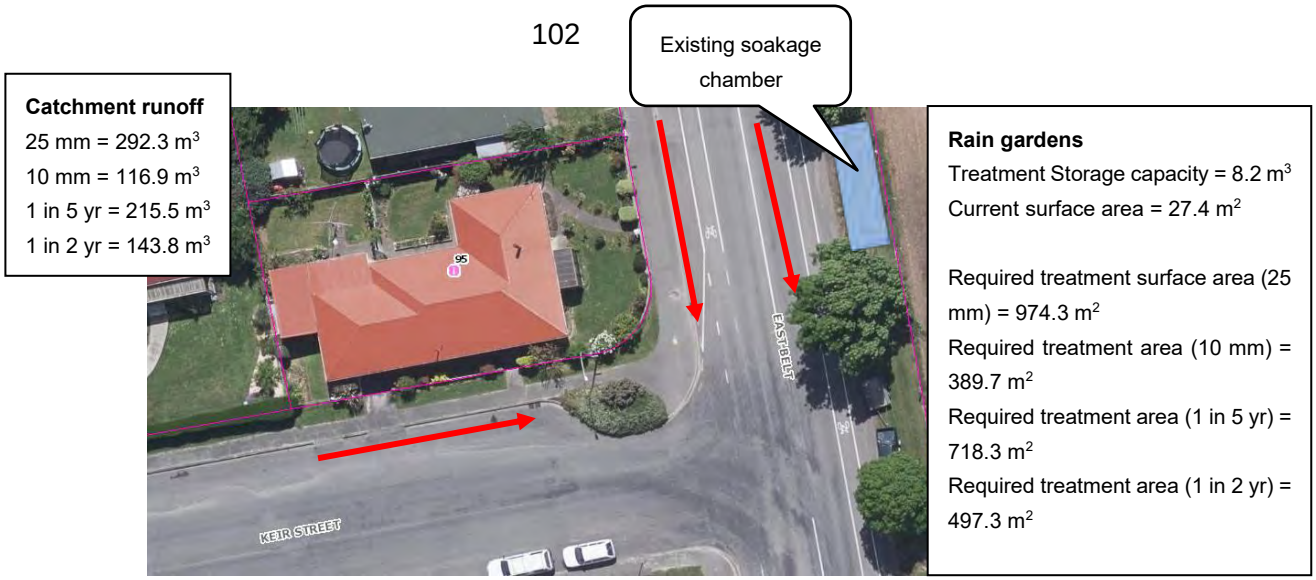


Figure 6. Keir Street and East Belt intersection garden area (excluding pipe manufacturers yard)

A rain garden at the intersection of East Belt and Keir Street would capture flow from the road reserves and the residential sub-catchments but not the pipe manufacturers yard in Keir Street or the upstream catchment shown in Figure 5. The existing planted area at the intersection would need to be enlarged to approximately 500 m^2 in order to provide treatment for the 1 in 2 runoff. There is not enough available space to construct a rain garden of the necessary size at this location therefore in order to provide the required treatment alternative treatment mechanisms would be required.

The current soakage chamber at the intersection of Keir Street and East Belt is estimated to have sufficient capacity to dispose of the flows from the 1 in 5 year storm event from the eastern section of road and berm only. There is not enough capacity to dispose of the whole catchment through the existing soak pit and alternative options should be considered.

For disposal of run-off from the 1 in 5 year storm event (assuming 300 mm/hr infiltration for disposal) a rapid infiltration chamber with volume of approximately 200 m^3 would be required, assuming a depth of 2 m.

Figure 7. Keir Street pipe manufacturers yard rain garden

The existing grassed area on Keir Street could be converted to a rain garden to capture run-off from Waters & Farr. The rain garden would need to be in the order of 157 m^2 for treating 1 in 2 year storm event or 240 m^2 to treat and dispose of the 1 in 5 year storm. There is sufficient space to allow for a rain garden of this size.

Due to the available land area, it could be possible to size the rain garden to treat and dispose of a larger volume, equating to the first 10 mm of the first flush from the catchment or potentially (subject to topography) disposal of some run-off from the East Belt Catchment identified in Figure 6.

It should be noted that the ground level in the area at the end of the cul-de-sac is approximately 1 m higher than the intersection of Keir Street and East Belt. Therefore whilst it may be suitable for a large raingarden for Waters & Farr run-off and separate disposal pit for the Keir Street/Eastbelt catchment in Figure 7 it is unlikely to be suitable for a raingarden serving the Figure 6 catchment and as such in order to provide the required treatment an alternative treatment mechanism would still be required for the Figure 6 catchment.

2. **Multiple proprietary devices** intercepting flows from smaller sub-catchments along East Belt in similar locations to where existing vegetated areas are and being disposed of via multiple rapid infiltration chambers. The soakage chambers would be required to be larger than those identified in Option 1 since the attenuation afforded by rain gardens would not be available. This would incur significant reduction in parking areas or land purchase.

3. **Retrofitted rain gardens where possible with proprietary devices where insufficient space is available.** Where treatment and disposal to ground is unavailable through rain gardens, as described under Option 1, a proprietary device and rapid infiltration chamber could be used. However, the flow required to treat would increase since the attenuation mechanism performed by the raingardens would not occur. Where proprietary devices are used the soakage chambers would be required to be larger than those identified in Option 1 since the attenuation afforded by rain gardens would not be available.

Each option's advantages and limitations are described in Table 4.

Table 4. Advantages and limitations of each option considered

OPTION	ADVANTAGES	LIMITATIONS
1.	Ecological solution Educational opportunity for students at Rangiora High School High visual amenity value for school students and East Belt Possible to soak some stormwater to ground through the base of the rain gardens High quality water treatment Reduces runoff volumes downstream Moderate capital cost	Requires a contractor who is able to construct the rain gardens correctly Existing garden areas would require enlarging slightly in several areas The larger catchments require significant areas for treatment which is unlikely to be available in all locations Small rain gardens are not as cost effective as the large rain gardens Large ponding area required to capture 100% 25 mm first flush so treatment limited to 1 in 2 year storm event Car Parking considerably reduced if solely rely on rain gardens and soak pits.
2.	High quality of treatment potentially for increased return periods	High Capital Cost for high quality treatment (filtration)

	Car parking space for school and businesses not impacted Low surface area required Proprietary devices are able to be installed underground, allowing cars to park over top of them Soakage pits might be included under parking areas	Lower expense for low quality water treatment (gross pollutant removal) Large or significant quantity of soakage pits required since volume not attenuated by raingardens.
3.	High visual amenity value for near the school Educational opportunity for students at Rangiora High School High quality water treatment available through use of upstream rain gardens Where ponding area unavailable upstream for first flush, downstream proprietary devices able to treat excess. This allows car parking over top Practical to build	Requires a contractor who is able to construct the rain gardens correctly Requires multiple proprietary devices and rapid infiltration pits downstream Moderately High Capital Cost depending on quantity and quality of treatment required by proprietary device An enlargement of some rain gardens upstream can reduce total runoff volumes during 1 in 2 year and 1 in 5 year storm – not all garden areas have the required space available

6. MULTI CRITERA ANALYSIS

The multi criteria analysis (MCA) for the four options is shown in Table 5.

Table 5. Multi criteria analysis

Performance measure	Weighting factor	Option 1	Option 2	Option 3
Cost	4	3	1	2
Impact on parking	3	3	2	1
Water Sensitive Urban Design	3	3	1	2
Maintenance	3	1	3	2
First flush treatment	5	1	3	2
Disposal to ground	5	1	2	3
Buildability	4	1	3	2
Educational for Rangiora High School students	4	2	1	3
Total score		55	63	68

The MCA conveys the most preferable solution is Option 3.

7. PREFFERED OPTION DEVELOPMENT

Based on the list of advantages and limitations and the MCA the preferred solution is Option 3 – small rain gardens upstream and proprietary devices downstream.

The aim for the design was to treat the 1 in 2 year storm run-off and to dispose of a 1 in 5 year storm event. The sub-catchments were grouped according to where the stormwater upstream could be treated and disposed to ground via rain gardens, and where downstream stormwater could be treated via proprietary device and soaked away to ground via rapid infiltration, as seen in Figure 8.

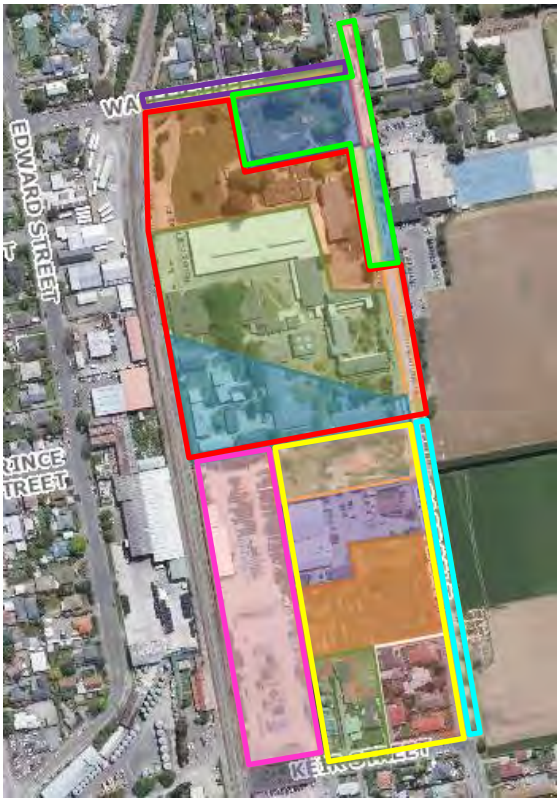


Figure 8. Enclosed sub-catchments

Purple enclosed sub-catchment
By enlarging the existing planted area to 26.3 m^2, it is possible to treat the 1 in 2 year storm event for this section as described in Figure 2. This will reduce parking in this area by one space, which is viable.

It is possible to dispose of the 1 in 5 year storm event by constructing a rapid infiltration chamber beneath the enlarged rain garden that has sufficient storage to store the difference in volume between the two critical storms. Adequate storage is required because due to the short time frame of the design storm, minimal water would have infiltrated away.

Green enclosed sub-catchment
The runoff from the upper western East Belt during a 1 in 2 year storm event is unable to be treated by the existing surface area of vegetation on the western side, however the eastern side has sufficient space for the eastern side of the road's runoff. Therefore to treat the remainder of flow from the western side of the road during a 1 in 2 year storm, a proprietary device should be used. The expected flow rate from the western side during a 1 in 2 year storm is 22.4 L/s, Table 8 shows potential proprietary device options.

There is a higher runoff volume and flow from the western side compared to the eastern side, so a pipework link between disposal systems either side of the road was considered to be able to dispose of a 1 in 5 year storm. This pipework link would likely be a DN300 pipe.

Table 8. Potential proprietary devices for green enclosed section

DEVICE	QUANTITY	COST
Jellyfish	1x 8 cartridges	$110k
Vortcapture	VC60	$10k
Cascade separator	NA	NA

Red enclosed sub-catchments

This section contains majority of Rangiora High School, which is mostly impervious. This results in high peak flow rates and volumes of runoff.

It is suggested the excess flow be captured and conveyed via pipe at the downstream end of the school to the eastern side where there is a larger existing garden and more room for proprietary devices, see Figure 9. The existing areas of vegetation are not large enough to treat the entire 1 in 2 year storm runoff from this section and would require a size increase of approximately four, as shown in Figure 5.

Due to the pressure of parking in this area, it would not be acceptable to increase the size of this garden by four. Consideration was given to increasing the detention depth, however due to the proximity to the school it would not be safe for students to have any detention depths greater than 300 mm.

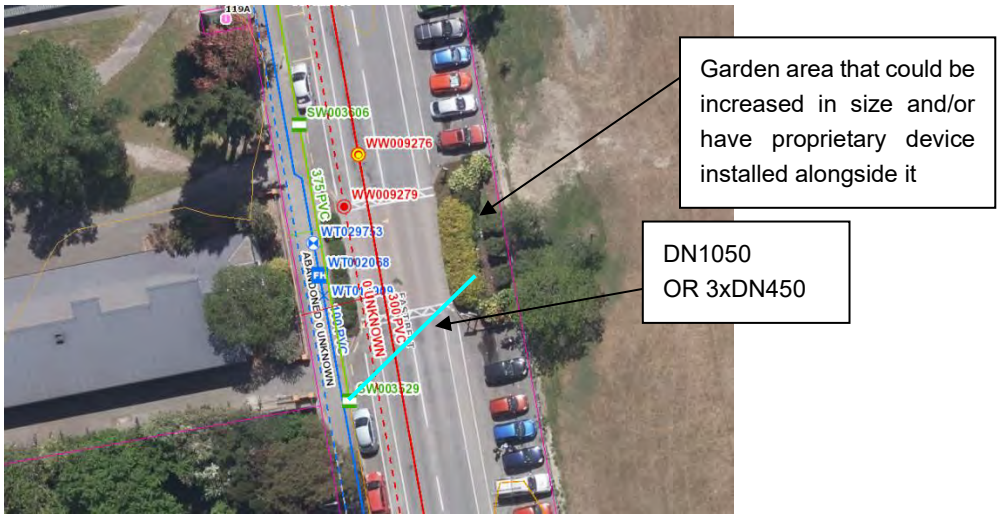


Figure 9. Large potential rain garden

Therefore, proprietary devices are proposed alongside retrofitted rain garden areas to treat the remaining runoff during a 1 in 2 year storm. According to calculations, the combined runoff flow would be ~325 L/s during a 1 in 5 year storm and ~214 L/s during a 1 in 2 year storm. Proprietary devices that were considered to treat the school sub-catchments are listed in Table 9.

Table 9. School flow proprietary treatment cost assessment

DEVICE	QUANTITY	COST
Jellyfish	4x 12 cartridges	$440k
Vortcapture	VC80	$45k
Cascade separator	NA	NA

The total volume that would need to be disposed of via rapid infiltration from all contributing areas in 1 in 5 year storm event is in the order of 150 m^3, as described by Figure 5. For calculation purposes, it was assumed that the rain garden is kept at it existing size and will detain 32.5 m^3.

The rapid infiltration chamber volume would need to be in the order of 3 m x 65 m and 2 m deep to be able to dispose of the volume, see Figure 10.

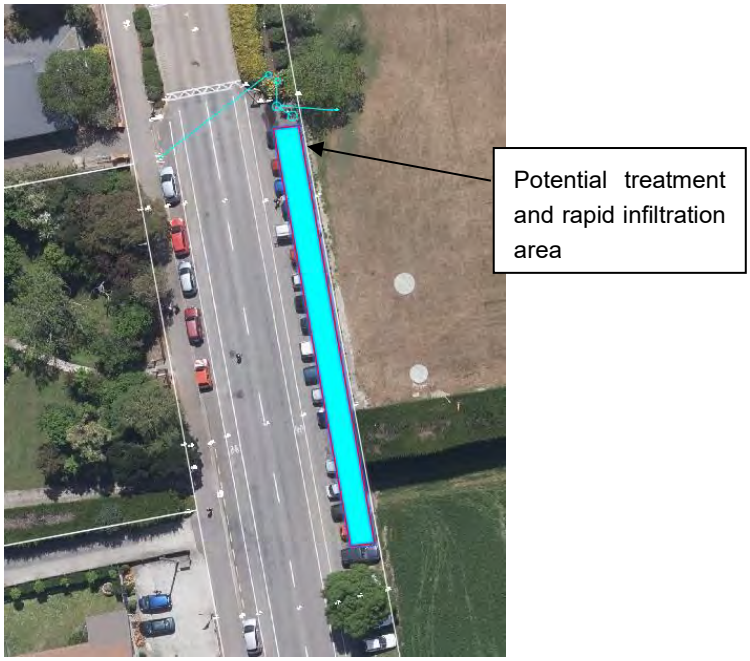


Figure 10. Required size of soak pit

Assuming an infiltration rate of 120 mm/hr, the outflow from this sized chamber is between 5 L/s and 9 L/s, which is minimal compared to the inflow rate of 325 L/s. The large volume of the chamber will allow for 150 m^3 of water be detained whilst the water infiltrates.

Pink enclosed sub-catchment

This area contains the Waters & Farr pipe supplier business which is 100% impermeable, hence has a large volume of runoff. There is a small reserve type area to the west of the entrance of Waters & Farr which could be used as a rain garden or have a proprietary device before using the area as a soak pit/infiltration chamber.

A constraint with this area is that the land naturally falls to the south-east, so the topography and depth will need to take into account site constraints and which might increase the depth of construction. The kerb and channel in Keir Street at the entrance to the yard area could be manipulated to fall west to east to allow water from Waters & Farr to drain into the rain garden without new pipes. Otherwise a circa DN600 pipe could be installed with a new large capacity sump at the western side of the Waters & Farr entrance to collect any runoff and convey to the treatment and soakage area.

The maximum potential area of the existing reserve for a rain garden is able to treat in the order of 20 mm of first flush from Waters & Farr, assuming existing trees are removed. Increasing the extended detention area depth will allow for greater first flush volumes to be treated and/or prevent the need for removing the existing trees if the rain garden is designed around them. Alternatively a smaller volume of first flush could be treated (equivalent to the 1 in 2 year run-off) and an area beneath the raingarden utilised for a large soakage chamber which might accommodate disposal of water from the Yellow catchment discussed in a following section.

Neon blue enclosed sub-catchment

There is a natural informal swale that runs down the eastern side of East Belt in this area. With some formalisation this swale could act as a treat swale for the stormwater that flows down this section and may be disposed via the existing soak pit near the corner of Keir Street and East Belt. The volume of first flush varies from ~47 m^3 to ~19 m^3 for 25 mm and 10 mm first flush depths respectively. The soak pit is estimated to have an infiltration rate of ~2 L/s and storage of

25 m^3. This catchment is estimated to have a total runoff volume of ~24 m^3 during a 1 in 5 year storm, with a flow of ~35 L/s. It is assumed the sump on the northern side of the soak pit would capture flow from this enclosed section and that no further stormwater infrastructure would be required (although some minor modifications to pipework could be considered).

Yellow enclosed sub-catchments

This section of sub-catchments has a mixture of the Baptist Church, Christian cemeteries and one residential property. The total volume of runoff for a 1 in 2 year storm is 128 m^3 and 1 in 5 is 191.3 m^3. There is one small existing garden area at the intersection of Keir Street and East Belt, which has capacity to detain 8.2 m^3, which is minimal compared to the expected runoff volumes. This section will require a proprietary device to treat the stormwater runoff for a 1 in 2 year peak flow of 110.3 L/s see Table 10, followed by a rapid infiltration chamber/soak pit.

Table 10. Yellow sub-catchment proprietary device options

PROPRIETARY DEVICE	QUANTITY	COST
Jellyfish membrane	2x 12 cartridge 54" cartridges	$220k
Vortex capture	1x VC70	$33k
Cascade separator	1x CS6	$16k

There is limited available space for a soak pit/rapid infiltration chamber along this stretch of East Belt due to existing trees and residential sections. The required rapid infiltration chamber size is greater than any available space in this area, so there are two potential solutions.

1. Purchase some of the adjacent land to construct a large soakage area to cater to 1 in 5 year storm that then joins the flow down the informal swale through the paddock, see Figure 11. This option has not been costed but would likely have a similar capital cost to Option 2.

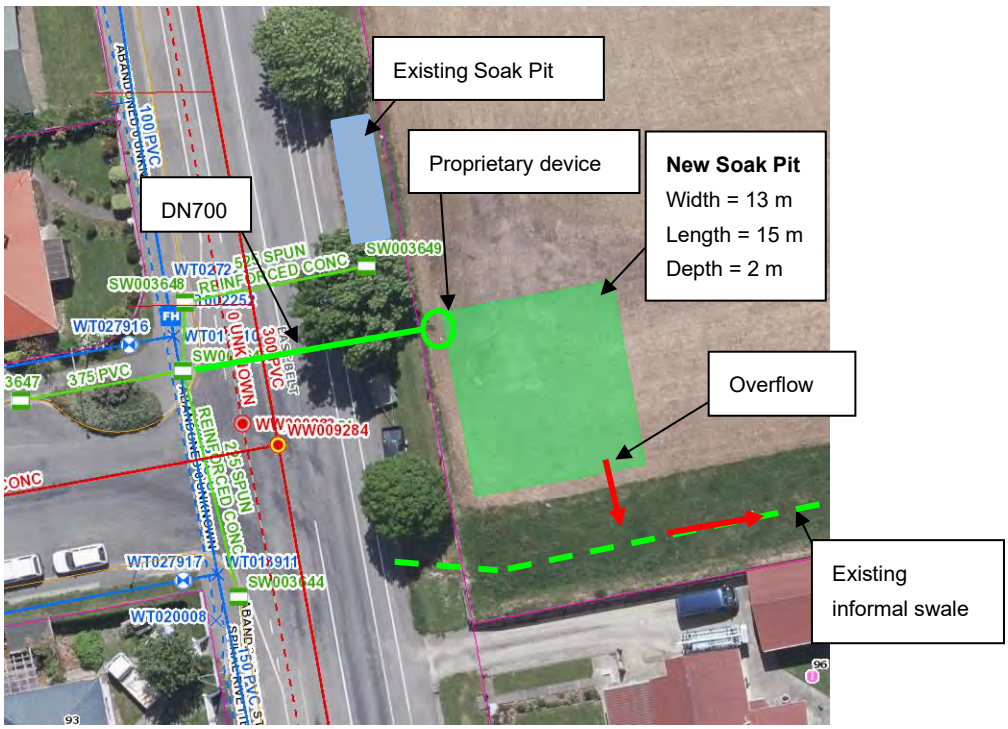


Figure 11. Large soak pit corner of Keir Street and East Belt

2. Convey the runoff down Keir Street toward the grassed area, which could have an increased soakage area beneath the proposed rain garden to accommodate the yellow enclosed section, see Figure 12.

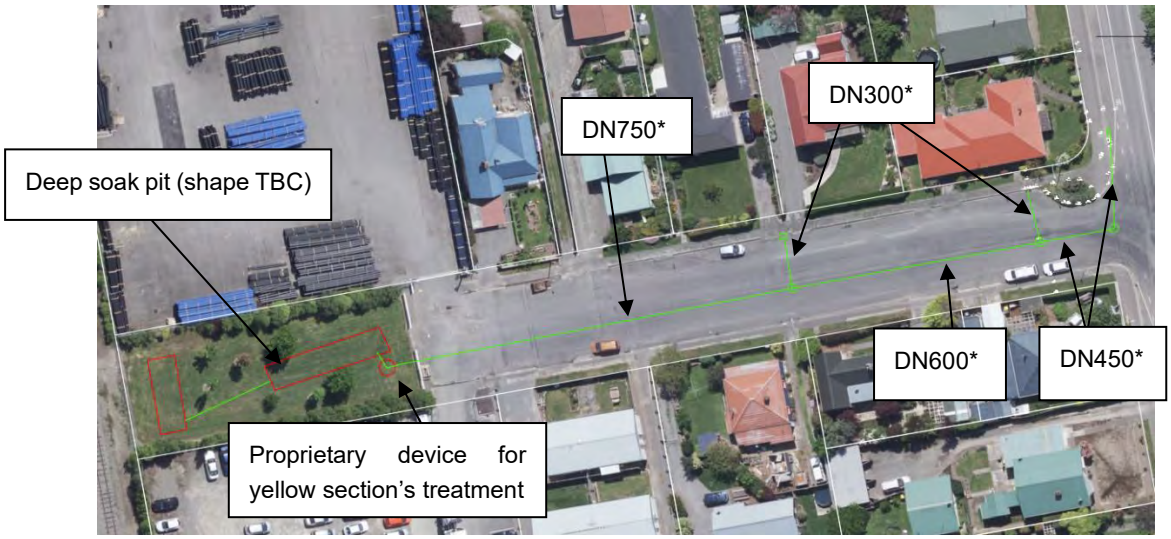


Figure 12. Deep soak pit on Keir Street

*Pipe sizes shown are indicative only and would be confirmed during a subsequent design stage.

8. RANGIORA HIGH SCHOOL CONSULTATION

On 21/09/2020 Claudia Button met with the Rangiora High School business manager, David Lowe, and briefly spoke to the principal, Karen Stewart, about converting the garden areas outside the school to rain gardens. The school representatives were happy to have these areas replaced as rain gardens and would like to have low level native plants in them as part of the treatment system. David commented that whilst parking is an issue around the school, they would not mind if some parks on the east side were taken up with rain gardens, if required. They expressed an interest in removing the tall vegetation for short vegetation on the eastern side of East Belt to the south of the school as the students often hide in there, see Figure 113. If/when construction is planned, it would be preferable it happen during school holidays to minimise disruption to school.

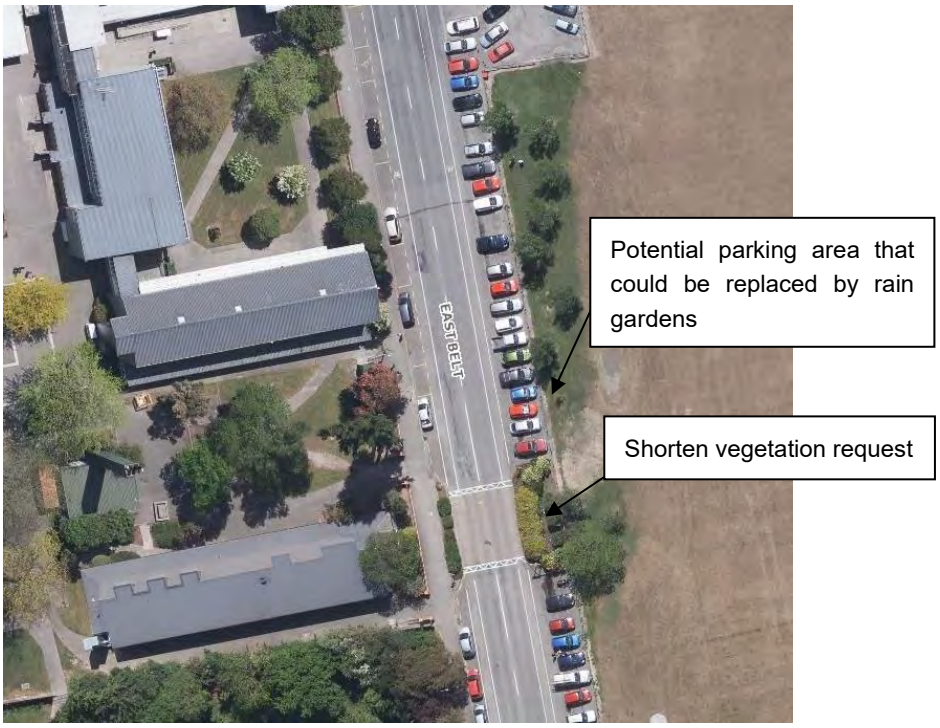


Figure 113. School suggestion for area potentially to be used for rain gardens and request for shorter vegetation

The school were interested in using the rain gardens as an educational opportunity and David wanted some more information about rain gardens to pass onto the science teachers so it can be planned into their school programme next year. Some ideas that have been discussed with the school are:

a. Urban stream syndrome (build-up of nutrients, gross pollutants, heavy metals etc in urban water ways and how it effects the ecosystems within the streams)
b. Contaminants from everyday activities ie roofs, cars, fertilizers etc.
c. Water cycle and how urban/impermeable areas effect it
d. Treating first flush and what it is.
e. Rain garden media used to treat the stormwater and how it treats it
f. Use of native plants within the rain gardens

Some interactive opportunities that were also discussed included:

a. Investigating which native plant varieties that would work best in Rangiora climates. In addition to this they could put together different combinations of plants and if it could be treated as a study location for the wider Waimakariri area.
b. Looking at the types of pollutants that the rain garden could treat from the catchment (nitrogen, phosphorus, sediment, etc.)
c. Investigating where the key discharge points from the school are and understanding the stormwater system at the school.
d. Monitoring the soakage rate in the rain gardens as it deteriorates over time due to the system becoming clogged
e. Ecosystems provided by the rain gardens

9. GREENSPACE CONSULTATION

Greenspace have an interest in the infrastructure in the area and are open to converting the gardens into rain gardens. Grant MacLeod agreed that the rain gardens would be a great educational opportunity for the Rangiora High School students and there are possibilities to involve the students if the school allows it, such as the options stated above.

A concern raised was around maintenance and the use of plants that will not grow large enough to become a nuisance to remove when the time comes to dispose of them i.e. kowhai tree and grasses/tussocks. Another point raised is that the media mix will be considered contaminated and will have to be disposed of at a special location when the media becomes requires replacement.

10. BUDGET ESTIMATIONS

With multiple options for some of the enclosed sub-catchments, Table 11 displays the chosen options that were priced.

Table 11. Treatment options costed

CATCHMENT	PRICED ITEM
Purple	Enlarge existing garden area to 26.3 m^2 and rapid infiltration chamber beneath
Green	• Retrofit existing gardens with rain gardens • Link disposal chambers west to east with a DN300 pipe • Treat remainder of flow with VC60 and construct rapid infiltration chamber beneath southernmost garden areas.
Red	• Retrofit existing areas with rain gardens to treat some runoff • Convey flow west to east with 3xDN450 • Treat remaining flow with VC60 and soak away to ground with large soak pit that allows vehicles to park overtop
Pink	• Rain garden sized to treat 1 in 2 year event and dispose of 1 in 5 via rapid infiltration beneath the rain garden • Kerb and channel manipulation for flow to go east to west into the rain garden
Neon blue	Utilise natural existing swale and existing soak pit
Yellow	• Cascade separator – CS6 to treat stormwater runoff • Flow sent down Keir Street towards grassed area, with enlarged rapid infiltration chamber beneath proposed rain garden

It was assumed that professional fees would equal 10% of the subtotal and an additional 30% contingency was added to reflect the conceptual nature of design. The cost estimate for the options described in Table 11 is in the order of $835,000.

The extreme scenario where only the jellyfish membrane proprietary devices are used instead of other devices increased the estimated cost to in the order of $1.9 million.

The cost estimation breakdown is attached as Appendix A.

11. SUMMARY

The preferred solution is Option 3 – rain gardens upstream and proprietary devices downstream where insufficient area exists. This means the Rangiora High School students are able to learn from and study the rain gardens retrofitted into the existing gardens if the school choses too. The runoff that is unable to be treated by a rain garden is able to be subsequently treated downstream with proprietary devices, without impacting parking capacity. Other options considered did not provide the required level of service, required an area than what is not available or rated lowly in the MCA.

The estimated cost of the recommended option was $835,000 and the maximum cost estimation for proprietary devises was in the order of $1.9 million. These prices are dependent on the level of treatment required, where the higher price indicates higher quality treatment. Therefore, lower

quality treatment with a cost estimation of $835,000 is recommended as this provides a better level of treatment than what exists currently.

Further infiltration testing will be carried out at the Keir Street grassed area and near the existing rain gardens to confirm infiltration rates for detailed design of rain gardens and rapid infiltration chambers during the detailed design stage.

APPENDIX A. Cost Estimate Breakdown

TRIM reference: 201002131421

WAIMAKARIRI DISTRICT COUNCIL

MEMO

FILE NO AND TRIM NO:	DRA-20-26/ 211101175363
YOUR REF:	PD001706
DATE:	3 November 2021
MEMO TO:	Kalley Simpson, 3 Waters Manager
FROM:	Claudia Button, Graduate Engineer
SUBJECT:	East Belt Rain Gardens – Addendum to Concept Design Memo

1. BACKGROUND

This memo is an addendum to the Concept Memo, see TRIM 201002131418. The scope has been revised to capture and treat as much runoff as possible using the existing garden areas, rather than catering for a specific return period design storm. The project scope has been amended to focus mainly on the area near Rangiora High School. The reasoning for this is due to the cost associated with the previous scope, and the potential learning opportunity for students at Rangiora High School. Water sensitive urban design has been a main focus for the addendum.

2. TREATMENT OPTIONS

Water sensitive urban design options considered included rain gardens, permeable pavement and tree pits. See examples below:

Rain gardens

Figure 1. Roadside Rain Garden (Source: https://www.watersensitivesa.com/wp-content/uploads/Plant-Species-Selection-in-Stormwater-Biofilters-Wetlands_S-Kennedy_Handouts.pdf)

Permeable Pavement

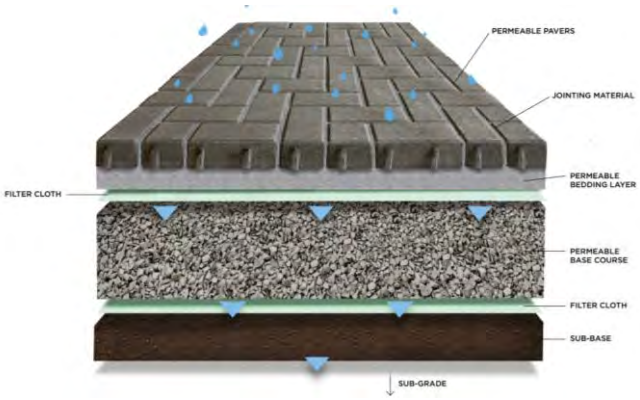


Figure 2. Permeable Pavement diagram (Source: Firth https://www.firth.co.nz/assets/Uploads/Brochures/Permeable-Paving-Guide-WEB.pdf)

Tree pits

Figure 3. Tree pit, surrounded by pavers (Source: https://www.geveko-markings.com/cases/stunning-tree-pits-with-geopavex/)

3. ISSUES

Being near a high school, it was important to consider how changes to the area nearby could impact upon the school and the students attending. Keeping the pathway width as wide as possible, and maintaining the existing accessibility is essential. Not inhibiting areas where buses park and students are dropped off were important.

Most stormwater runoff is coming from the western side of East Belt, where there is the least amount of area for stormwater management. Piping runoff across East Belt will help with providing more area for stormwater to be treated and disposed to ground.

4. ASSUMPTIONS

It was assumed that the stormwater runoff that passes through the rain gardens is to discharge to ground, not connect to a below ground stormwater network.

Sumps upstream of rain gardens will have their sump inlet changed either to a blocked inlet or a back entry sump with a higher inlet elevation to what currently exists. This is to force runoff from the road through the rain gardens for treatment. Some sumps have connections from the school stormwater network. It is assumed most of the runoff from the school is quite clean due to it being mostly roof run off and pedestrian walkways, so does not require treatment as much as the road runoff does. Excess stormwater which exceeds the ponding capacity of the rain gardens will spill over the weir within the rain garden and enter the stormwater network via the next downstream sump.

Pipe sizes to convey flow across roads are to be DN300 for all locations.

5. OPTIONS CONSIDERED

Locations where the three types of water sensitive design could be incorporated have been considered and are displayed below in Figure 4, Figure 5 and Figure 6.

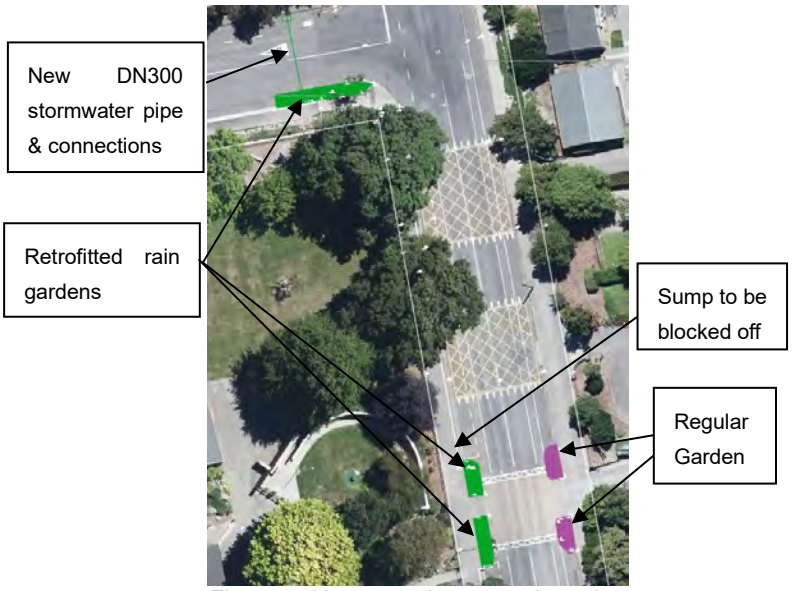


Figure 4. Upper section upgrade options

Upper Section Improvement Description:
Retrofitting existing garden areas was the most achievable outcome for this area. During the rain event 29 January 2021, ponding up to the footpath was witnessed on the south side of Wales Street. An increased garden area is recommended to improve treatment and infiltration capacity in this area. On the western side where there is no kerb and channel between the gardens, bridge blocks will be used to connect the gardens instead of scruffy domes and pipework due to cost.
Due to services on the eastern side in the kerb and channel it is proposed to not excavate the garden material out. Instead these gardens could have the plants replaced to mimic the look of the rain gardens.

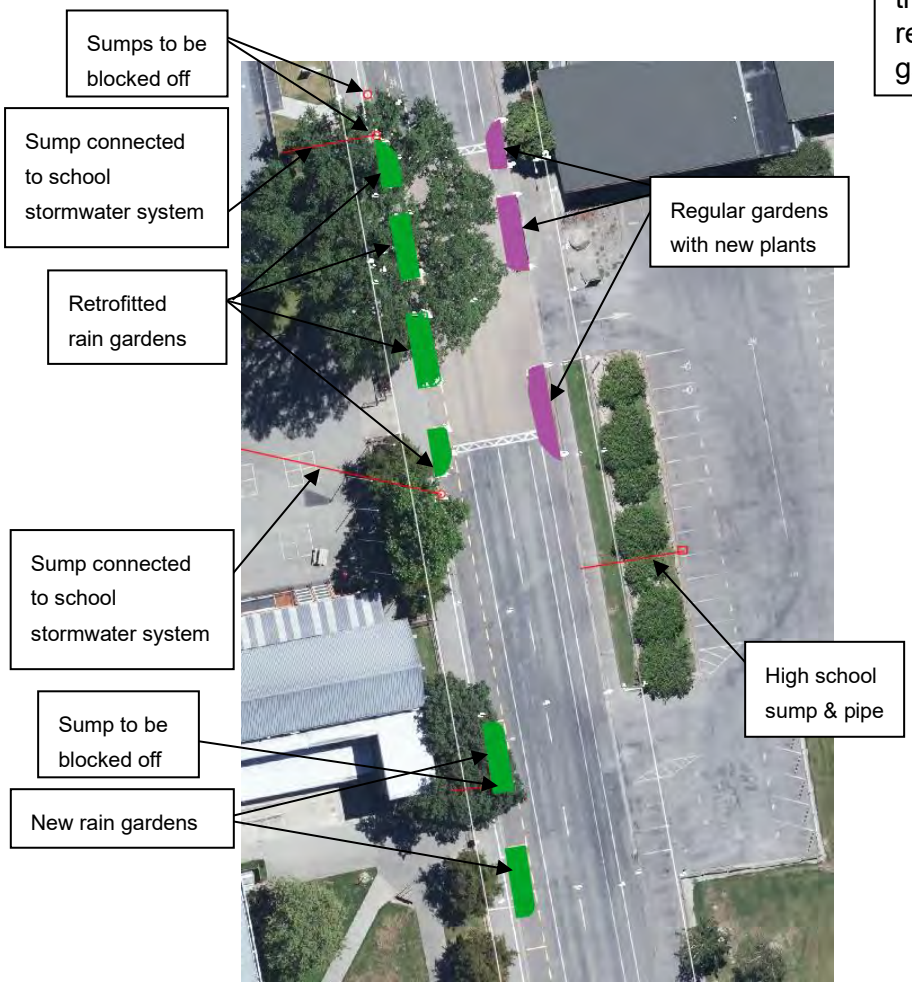


Figure 5. Mid-section upgrade options

Mid-Section Improvement Description: Retrofitting existing garden areas was the most achievable outcome for this area.

Due to services along the eastern side of East Belt, the gardens along this section are only to have the plants replaced to mimic what exists on the western side.

On the western side where there is no kerb and channel between the gardens, bridge blocks will be used to connect the gardens instead of scruffy domes and pipework due to cost.

Two new rain gardens are to be constructed where the old disabled parking was.

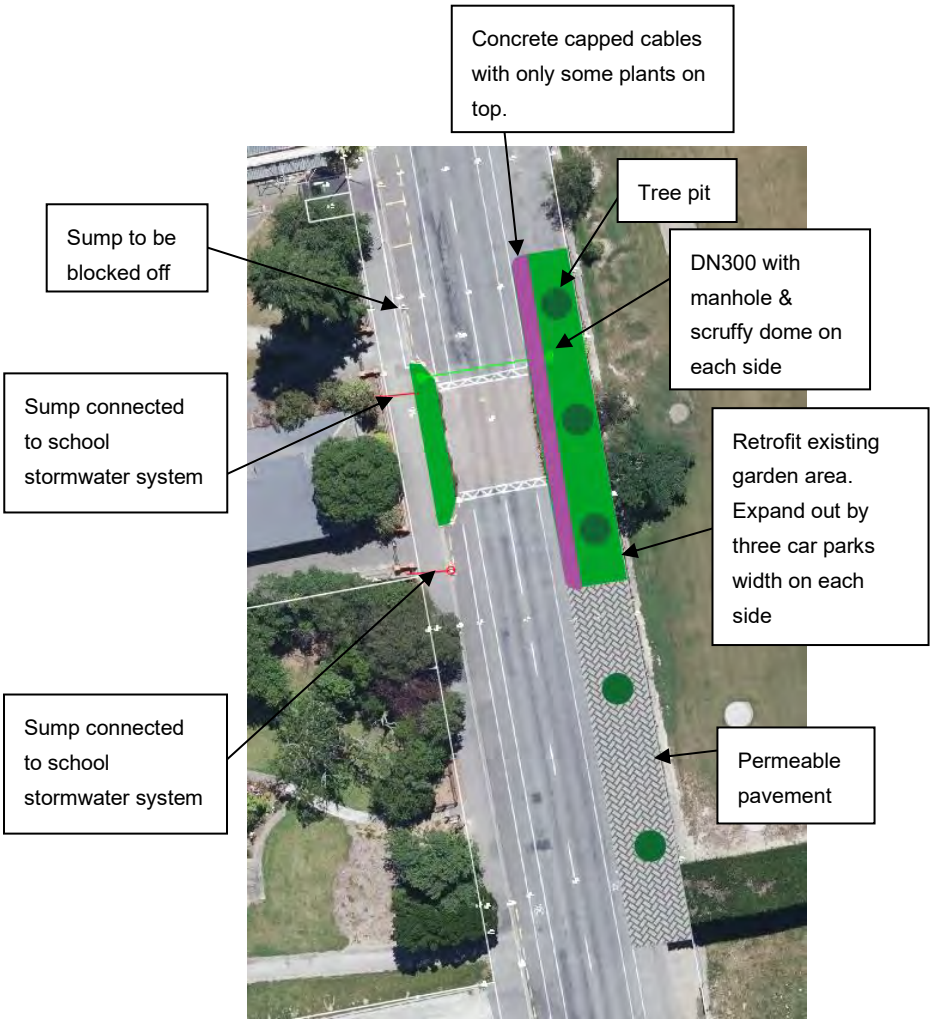


Figure 6. Lower section upgrade options

Lower Section Improvement Description:
Retrofit existing garden areas with rain gardens. Increase size of western garden by 6m on each side to increased infiltration capacity in this section. In the location of the enable cable, concrete cap over the cable and scarcely plant small plants over top.

One stormwater pipe connection across East Belt to area where there is additional infiltration capacity.

Where the chipped parking area is on the southern side of the new rain garden, cut out the swale area and reconstruct with permeable pavers.

Along the permeable pavers section, install tree pits for additional treatment/infiltration capacity. Recommended spacing is 15-20m.

Excess runoff will continue to run down the western side of East Belt until it reaches the sumps that connect to the soakpit. It will then either soakaway here, or flow back across to the eastern side.

6. ROADING CONSULTATION

Tim Donaldson from the Roading Team was consulted on the design options, shown in black. Design considerations/thoughts are shown in purple. Comments provided were:

- Most of East Belt has deep dish kerb and channel, so make sure the rain garden is lowered enough for flows to reach the area of the rain garden. *When replacing the existing gardens, the area will be excavated and reinstated with adequate levels to ensure ponding across the garden area. Detailed design could consider having a threshold elevation where ponding occurs below, and overtops this flow block when the rain garden is at its maximum capacity.*
- Tim asked about having provision for replacing some of the deep dish kerb and channel in the area where rain gardens are being retrofitted with flat channel, so that the crossing blocks can be removed. *This would only work in areas where the existing gardens are replaced, not along the entire length of East Belt.*
- Asked about maintenance in relation to bark/mulch that gets picked up during storm events. *Rain gardens do not use bark/mulch, as it is susceptible to floating when the rain gardens fill with water so has been designed out already.*
- From a maintenance point of view, would prefer to have rounded corners on concrete surrounds so that the sweeper trucks can manoeuvre around them. Instead of sharp corner concrete edges which requires manual sweeping with a broom. See examples below:

Bad kerb & channel

Good kerb & channel

Overall likes the idea of rain gardens, permeable pavement and tree pits along this section to help with stormwater management.

7. UTILITIES INVESTIGATION

Potential utility clashes were investigated using before you dig information.

Chorus cables are all within the footpath and are not at risk. There is a high voltage power cable that runs along the eastern side which presents some risk as it is either on the outer edge of the footpath or under kerb and channel. This limited what options were viable along majority of the eastern side of East Belt.

Enable runs along the eastern and western sides of East Belt, and on the north side of Wales Street. The cable down the western side is within the footpath and it was assumed it would not interfere with retrofitting rain gardens on that side. On the eastern side of East Belt, the existing garden areas are to have the plants replaced to mimic what is on the western side.

Where there is space for rain gardens within the berm, the area where the enable service exists will be concrete capped. The remainder of the area not clashing with enable will be converted to a rain garden.

8. COST ESTIMATION

A high level cost estimate is shown in Table 1. The cost estimates include a 30% contingency and 10% professional fees cost, for each section. It is possible to mix and match different elements of the different sections.

The 2022/23 budget for the East Belt Rain Garden project is $150,000. Based on cost estimates completed for the design in the 2021/22 financial year, there should be some carry over to the 2022/23 financial year. Currently this is estimated to be approximately $45k.

Table 1. High level cost estimate

Portion of Upgrade	Cost Estimate
Upper section	$56,000
Mid-section	$66,000
Lower section – rain gardens + tree pits	$168,000
Lower section – permeable pavement	$92,000
Total	$382,000

A full breakdown of the costs are shown in Appendix A.

9. RECOMMENDATIONS

Based on the estimated budget available for construction in the 2022/23 financial year, $195k it is not possible to upgrade all three sections along East Belt. There are a few combinations of upgrades that could be achieved, see Table 2.

Table 2. Upgrade Options

Option	Upgrades	Cost Estimate
1	Upper Section Mid-Section	$122,000
2	Upper Section Lower Section – permeable pavement	$148,000
3	Lower Section – Rain gardens + tree pits	$168,000

Option 3 is recommended as it provides the largest area for stormwater infiltration, which will be the most beneficial to the area. Rain gardens and tree pits will provide a learning opportunity for the students at Rangiora High School.

Option 1 and 2 would provide limited stormwater infiltration for the cost associated with upgrading those sections.

10. SUMMARY

There are multiple options to upgrade the stormwater network on East Belt, in the vicinity of Rangiora High School. Based on the combination of 2021/22 and 2022/23 budgets, it is recommended to construct rain gardens and tree pits in the lower portion of the school area. This will improve stormwater runoff volumes downstream from this point and provide an educational opportunity to the students of Rangiora High School.

Appendix A – High Level Cost Estimate

TRIM 211101175365

East Belt Rain Gardens							
Costed by Claudia Button				Date: 1/11/2021			
				Engineer's Estimate			
Item	Description	Quantity	Unit	Rate		Amount	
1.0	PRELIMINARY AND GENERAL						
1.1	Site Establishment	100%	LS		12% of sub-total	$	29,846.06
1.2	Setting-Out	100%	LS				
1.3	Erosion & Sediment Control	100%	LS				
1.4	Traffic Management	100%	LS				
1.5	Health & Safety	100%	LS				
1.6	As-built Information	100%	LS				
1.7	Location & Protection of Existing Services including potholing	100%	LS				
1.8	CCTV Stormwater pipes to be abandoned to determine existence of laterals	100%	LS				
2.0	STORMWATER INFRASTRUCTURE						
2.1	Upper Portion						
2.1.1	Remove existing vegetation	100%	LS	$ 1,000.00	Estimate	$	1,000.00
2.1.2	Rain gardens media	45.2	m2	$ 138.30	Calculated using quote for media mix and quotes for other materials online	$	6,251.16
2.1.3	Rain garden plants	64.6	m2	$ 27.00	Av. quote from CON 20/31	$	1,744.20
2.1.4	Concrete surround with reinforcement	58	m	$ 200.00	Estimate	$	11,600.00
2.1.5	Cut to waste	45.2	m3	$ 60.00	Av tender rate CON 20/31. Assuming 1m excavation below garden & pavement sections	$	2,712.00
2.1.6	Supply and install DN300 RCRRJ Class 2 pipe (incl. trench reinstatement), up to 1.0m deep	12	m	$ 423.06	CON 19/58 SPC ave tender rate 2.1.3	$	5,076.72
2.1.7	Supply & install standard single 450mm square sump with grate	1	ea.	1836.42	Av tender rate CON 20/31 4.2	$	1,836.42
2.1.8	Break out existing sump and dispose of	1	ea.	$ 1,180.00	av tender rate CON 20/25	$	1,180.00
2.1.9	DN600 manhole with low profile scruffy dome	1	ea.	$ 2,817.40	CON 20/38 av tender price 4.5.3	$	2,817.40
2.1.10	Reseal road shoulder adjacent to new concrete surround	100%	LS	$ 2,000.00	Estimate	$	2,000.00
2.1.11	Bridge Blocks	3	m	$ 70.00	Estimate	$	210.00
2.2	Mid Portion						
2.2.1	Remove existing vegetation	100%	LS	$ 1,000.00	Estimate	$	1,000.00
2.2.2	Rain Gardens - media	76	m2	$ 138.30	Calculated using quote for media mix and quotes for other materials online	$	10,510.80
2.2.3	Rain gardens - plants	117	m2	$ 27.00	Av. quote from CON 20/31	$	3,159.00
2.2.4	Concrete surround with reinforcement	100	m	$ 200.00	Estimate	$	20,000.00
2.2.5	Cut to waste	76	m3	$ 60.00	Av tender rate CON 20/31. Assuming 1m excavation below garden & pavement sections	$	4,560.00
2.2.6	Reseal road shoulder/replace pavers adjacent to new concrete surround	100%	LS	$ 3,000.00	Estimate	$	3,000.00
2.2.7	Bridge Blocks	12	m	$ 70.00	Estimate	$	840.00
2.3	Lower Portion						
2.3.1	Remove existing vegetation	100%	LS	$ 1,500.00	Estimate	$	1,500.00
2.3.2	Rain Gardens - media	224	m2	$ 138.30	Calculated using quote for media mix and quotes for other materials online	$	30,979.20
2.3.3	Rain gardens - plants	280	m2	$ 27.00	Av. quote from CON 20/31	$	7,560.00
2.3.4	Concrete Surround with reinforcement	131.849556	m	$ 200.00	Estimate	$	26,369.91
2.3.5	Tree pit - media	35.3	m2	$ 138.30	assumed same as rain garden	$	4,887.93
2.3.6	Tree pit - plants	5	ea.	$ 75.00	Estimate	$	375.00
2.3.7	Tree pit - concrete surround	66.0	m	$ 120.00		$	7,916.81
2.3.8	Permable Pavers	245	m2	$ 183.40	$2 for a 200mmx100mm paver + 1m of basecourse, geotextile fabric etc. below the pavers based on CON 20/31	$	44,933.00
2.3.9	Cut to waste	469.0	m3	$ 60.00	Av tender rate CON 20/31. Assuming 1m excavation below garden & pavement sections	$	28,140.00
2.3.10	Supply and install DN300 RCRRJ Class 2 pipe (incl. trench reinstatement), up to 1.0m deep	14	m	$ 423.06	CON 19/58 SPC ave tender rate 2.1.3	$	5,922.84
2.3.11	DN600 manhole with low profile scruffy dome	2	ea.	$ 2,817.40	CON 20/38 av tender price 4.5.3	$	5,634.80
2.3.12	Reseal road shoulder/replace pavers adjacent to new concrete surround	100%	LS	$ 2,000.00	Estimate	$	2,000.00
2.3.13	Concrete capping around services	100%	LS	$ 3,000.00	Estimate	$	3,000.00
	Subtotal					$	248,717.19
	Total					$	278,563.25
	Professional fees (10%)					$	27,856.33
	Contingency (30%)					$	74,615.16
	TOTAL (GST EXCLUSIVE)					***$***	***381,034.74***

WAIMAKARIRI DISTRICT COUNCIL

MEMO

FILE NO AND TRIM NO:	DRA-20-26 / 230403046730
DATE:	04 April 2023
MEMO TO:	Jason Recker, Stormwater and Drainage Asset Manager
FROM:	Claudia Button, Project Engineer
SUBJECT:	East Belt Rain Gardens – Final Conceptual Design

1. BACKGROUND

This report is to finalise the conceptual design for the East Belt Rain Gardens project. It is a confirmation of design options that were investigated during the Conceptual Memo (TRIM 201002131418) and Addendum to Concept Memo (TRIM 211101175363).

2. ISSUES

Flooding has been a reoccurring issue at the southern end of East Belt, specifically at the Keir Street intersection. In 2020 a soak pit was constructed near the Keir Street intersection to help soak away stormwater runoff. In recent flooding events in May/June 2022 there was a service request received that related to the soak pit overflowing across East Belt due to a high volume of stormwater runoff overloading the soak pit (DR2200907). Improvements suggested to be undertaken with the East Belt Rain Gardens project are to help alleviate downstream flooding as much as practical, rather than meet level of service requirements as per the Waimakariri District Council Engineering Code of Practice.

3. WORKSHOP OUTCOMES

Due to the likelihood of clogging in permeable pavement suggested in this area, this type of stormwater solution is not recommended to be pursued for the stormwater improvements in this area. The catchment is likely to yield a high sediment load which would inhibit the permeability of the pavement and not improve the stormwater in the area.

Tree pits suggested in previous reports are also to be avoided, and preference given to low growing rain garden plants instead. This is due to the roots binding with sediment quickly, increased safety requirements to protect people in vehicles and they are known to be prone to collapsing over time. Depending on the location of the tree pits relative to groundwater, and the depth the root zone may expand to where if interception with groundwater is experienced the root zone could be saturated and inhibit growth and functionality of the tree pits. Additionally, maintenance of replacing the trees would be more difficult than removing multiple smaller plants used in rain gardens.

Rain gardens were the agreed best solution going forward for this area. In addition to the classic rain garden, it was suggested an infiltration swale/trench be integrated into the design for this area. This is to help with infiltrating as much runoff as possible that passes through each rain garden. This increases the storage and infiltration capacity of each garden upstream, to improve downstream flooding. Plant selection will require taking this

into account, as it will not be a typical rain garden design. Consideration is required to reduce the sediment load entering the rain gardens to ensure they do not clog prematurely from the potentially high sediment load in this area as experienced with other rain gardens in Christchurch and other areas.

4. CONCEPTUAL DESIGN

Rain gardens are to be retrofitted into existing rain garden areas, and where possible areas of existing garden are to be enlarged to maximise the storage and infiltration capacity of rain gardens. As described in previous design memos the majority of stormwater runoff is from the western side of East Belt where there is minimal footprint to create a rain garden. Stormwater should be conveyed across to the eastern side where practical as there is a greater area to store and infiltrate water.

To reduce the volume of sediment entering the rain garden areas, concrete aprons with a barrier should be incorporated into the design at each entry point along the kerb and channel to collect sediment prior to it entering the rain garden. Additionally, small indents (sediment grooves) in the kerb and channel preceding the rain gardens should be considered to capture additional sediment prior to the sediment forebay, see Figure 1.

Figure 1. Sediment Groove (Manningham Council, 2015)

Instead of installing a typical rain garden with a specific media for the entire volume of the rain garden. These rain gardens will appear to be a classic rain garden on the upper half. On the lower half there will be an infiltration trench base to allow a greater capacity of water to be discharged to ground during rain events. It is proposed to use river run gravels (or similar) wrapped in geotextile cloth beneath the rain garden media. This will operate as a hybrid of the two where some filtration of contaminants will occur due to the rain garden media used in the top half, and an increased drainage capability beneath to infiltrate stormwater to ground. Refer to Figure 2 for a sketch.

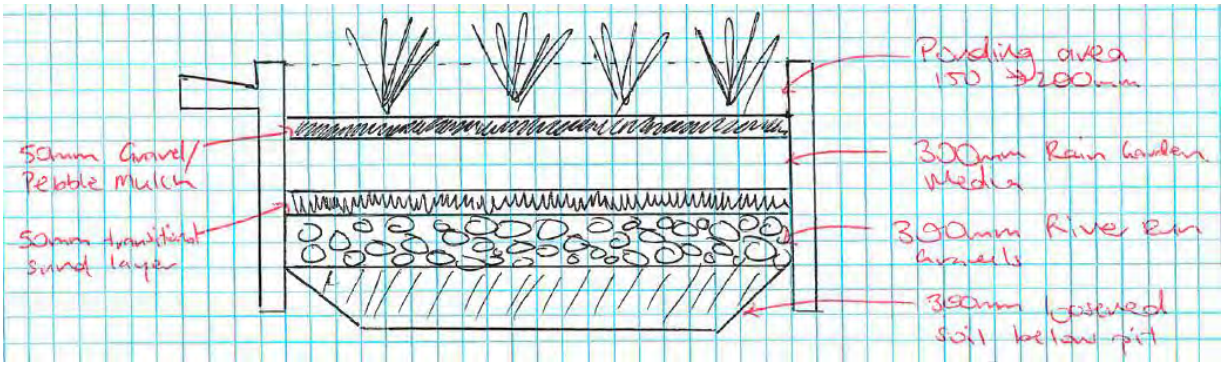


Figure 2. Infiltration Trench / Rain Garden Hybrid Sketch

The “Upper Section” improvements will remain the same as described in the addendum report (TRIM 211101175363), see information below.

“Retrofitting existing garden areas was the most achievable outcome for this area. During the rain event 29 January 2021, ponding up to the footpath was witnessed on the south side of Wales Street. An increased garden area is recommended to improve treatment and infiltration capacity in this area. On the western side where there is no kerb and channel between the gardens, bridge blocks will be used to connect the gardens instead of scruffy domes and pipework due to cost. Due to services on the eastern side in the kerb and channel it is proposed to not excavate the garden material out. Instead these gardens could have the plants replaced and gravel mulch laid to mimic the look of the rain gardens.” Refer to Figure 3 below.

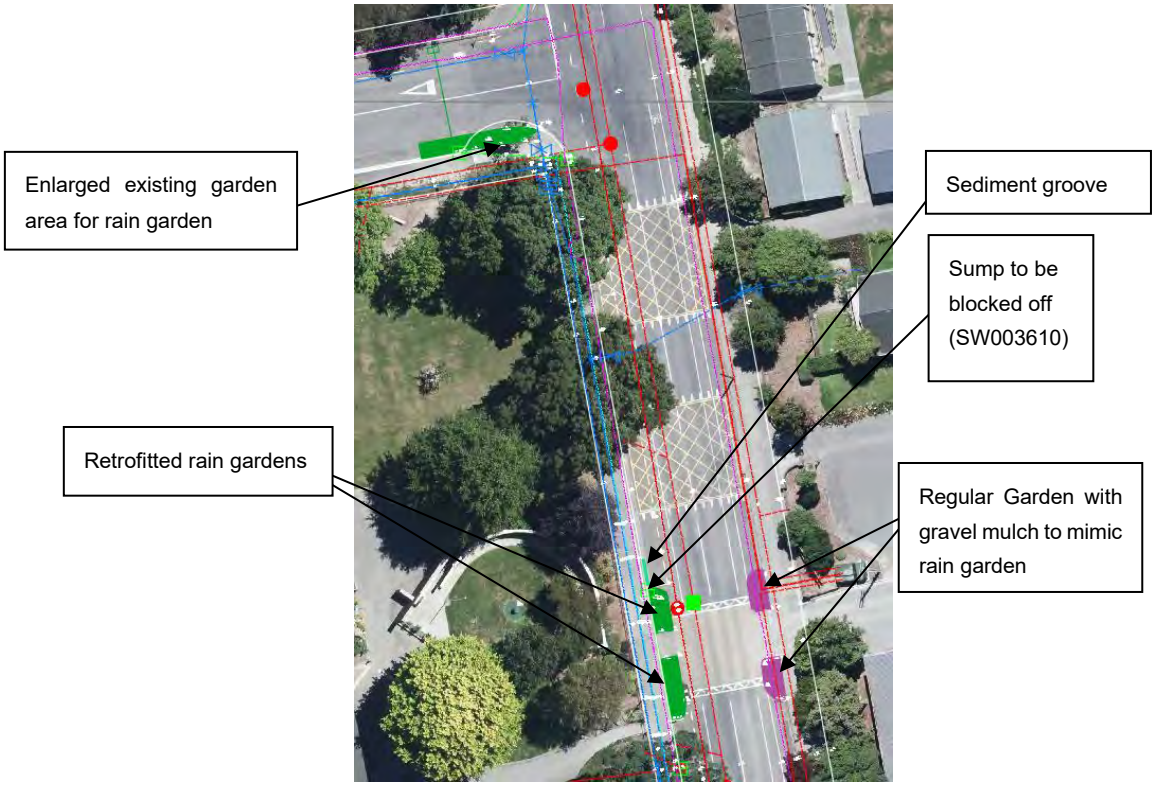


Figure 3. Upper section upgrades

The mid-section upgrades will remain mostly the same as the addendum report. Two areas of rain gardens have been removed at the southern end of the portion to reduce the cost of the project. With this change it will only be retrofitting existing gardens, rather than installing two new garden areas on the entrance/exit point at the southern end of the school. Refer to Figure 4 for revised area for mid-section upgrades.

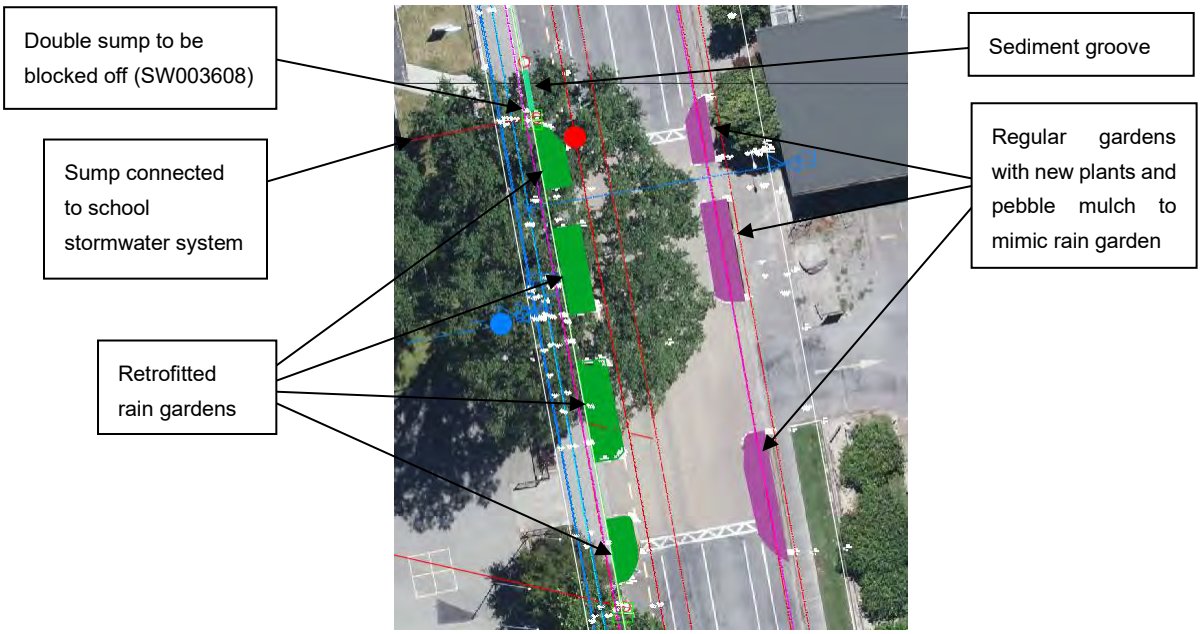


Figure 4. Mid-section upgrades

The lower section has had the permeable pavement and tree pits removed from the design options. The size of the large rain garden on the eastern side of East Belt has been reduced to ensure it is affordable. The concept design cost estimate includes 25% construction contingency which will be refined at detail design and may allow for a larger rain garden area at detailed design. This is recommended to be considered if budget allows due to the large available area on the eastern side. Alternatively, the garden on the western side could remain a "regular garden" and the garden on the eastern side be expanded which will increase the value for money of conveying water to the eastern side.

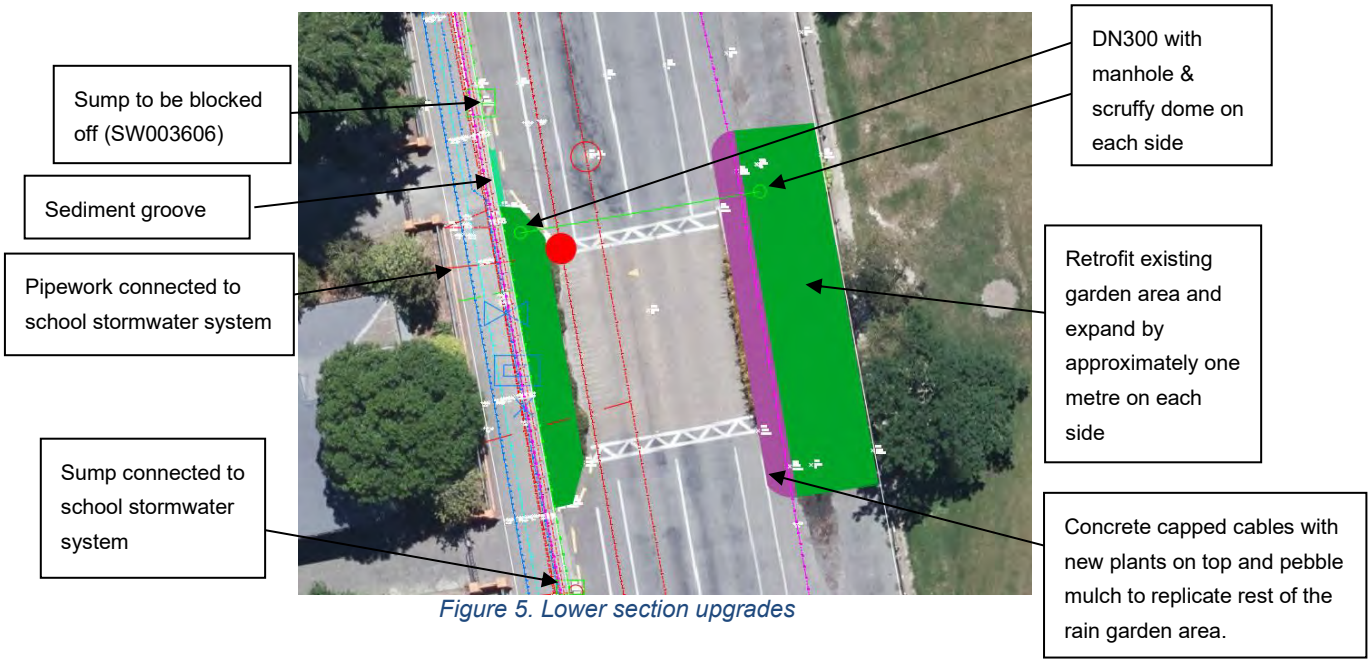


Figure 5. Lower section upgrades

5. COST ESTIMATE

The East Belt Rain Gardens project is funded by the East Belt Rain Gardens & Soakpit budget (PJ 101349.000.5123). The engineer's high level cost estimate for professional fees and construction costs versus the available budget for respective years is shown in Table 1 below.

Table 1. Financial summary for East Belt Rain Gardens Project

Financial Year	Budget	Engineer's Estimate
2022/23	$90,000*	$90,000*
2023/24	$210,000	$215,500
Total	**$300,000**	**$305,500**

*includes carryover

The high level cost estimate for the design is 3% over the available budget for the construction works for the 2023/24 financial year, as shown in Appendix A. The estimate includes 25% construction contingency which will reduce as the design is progressed into further detail and more confidence can be placed on the quantities. The cost estimate will be further refined during detailed design to ensure the design is affordable based on recent tendering rates Council has received for other projects with similar line items. Due to high inflation costs over the last year some items may have increased in price. This will be included in the next cost estimate.

6. RECOMMENDATION

It is recommended that this finalised conceptual design be progressed to detailed design. Although the engineer's estimate is greater than the available budget, the design can be further refined and greater confidence be placed on the engineers estimate for tendering work in future for construction next summer (2023/24), while Rangiora High School is on summer break.

7. REFERENCES

Manningham Council. (2015). *Zero Additional Maintenance Water Sensitive Urban Design Handbook.*

APPENDIX A: HIGH LEVEL COST ESTIMATE (TRIM 230404046869)

Item	Description	Quantity	Unit	Engineer's Estimate Rate		Amount
1.0	**PRELIMINARY AND GENERAL**					
1.1	Site Establishment	100%	LS		12% of sub-total	$ 17,445.58
1.2	Setting-Out	100%	LS			
1.3	Erosion & Sediment Control	100%	LS			
1.4	Traffic Management	100%	LS			
1.5	Health & Safety	100%	LS			
1.6	As-built Information	100%	LS			
1.7	Location & Protection of Existing Services including potholing	100%	LS			
1.8	CCTV Stormwater pipes to be abandoned to determine existence of laterals	100%	LS			
	Sub-total					$ 17,445.58
2.0	**STORMWATER INFRASTRUCTURE**					
2.1	**Upper Portion**					
2.1.1	Remove existing vegetation	100%	LS	$ 1,000.00	Estimate	$ 1,000.00
2.1.2	Rain gardens media	45.2	m3	$ 138.30	Calculated using quote for media mix and quotes for other materials online	$ 6,251.16
2.1.3	Rain garden plants	64.6	m2	$ 27.00	Av. quote from CON 20/31	$ 1,744.20
2.1.4	Concrete surround with reinforcement	58	m	$ 250.00	Estimate	$ 14,500.00
2.1.5	Cut to waste	45.2	m3	$ 60.00	Av tender rate CON 20/31. Assuming 1m excavation below garden	$ 2,712.00
2.1.6	Supply and install DN300 RCRRJ Class 2 pipe (incl. trench reinstatement), up to 1.0m deep	12	m	$ 423.06	CON 19/58 SPC ave tender rate 2.1.3	$ 5,076.72
2.1.7	Supply & install standard single 450mm square sump with grate	1	ea.	$ 1,836.42	Av tender rate CON 20/31 4.2	$ 1,836.42
2.1.8	Break out existing sump and dispose of	1	ea.	$ 1,180.00	av tender rate CON 20/25	$ 1,180.00
2.1.9	DN600 manhole with low profile scruffy dome	1	ea.	$ 2,817.40	CON 20/38 av tender price 4.5.3	$ 2,817.40
2.1.10	Reseal road shoulder adjacent to new concrete surround	100%	LS	$ 2,000.00	Estimate	$ 2,000.00
2.1.11	Bridge Blocks	3	m	$ 70.00	Estimate	$ 210.00
2.1.12	Remove existing kerb and channel	3	m	$ 52.86	CON 19/65 rev 2 average tender price	$ 158.57
2.1.13	Supply and install sediment groove kerb and channel	3	m	$ 196.53	CON 19/65 rev 2 average tender price + 20%	$ 589.59
2.2	**Mid Portion**					
2.2.1	Remove existing vegetation	100%	LS	$ 1,000.00	Estimate	$ 1,000.00
2.2.2	Rain Gardens - media	46	m3	$ 138.30	Calculated using quote for media mix and quotes for other materials online	$ 6,361.80
2.2.3	Rain gardens - plants	87	m2	$ 27.00	Av. quote from CON 20/31	$ 2,349.00
2.2.4	Concrete surround with reinforcement	62.8	m	$ 250.00	Estimate	$ 15,700.00
2.2.5	Cut to waste	46	m3	$ 60.00	Av tender rate CON 20/31. Assuming 1m excavation below garden & pavement sections	$ 2,760.00
2.2.6	Reseal road shoulder/replace pavers adjacent to new concrete surround	100%	LS	$ 3,000.00	Estimate	$ 3,000.00
2.2.7	Bridge Blocks	12	m	$ 70.00	Estimate	$ 840.00
2.2.8	Remove existing kerb and channel	3	m	$ 52.86	CON 19/65 rev 2 average tender price	$ 158.57
2.2.9	Supply and install sediment groove kerb and channel	3	m	$ 196.53	CON 19/65 rev 2 average tender price + 20%	$ 589.59
2.3	**Lower Portion**					
2.3.1	Remove existing vegetation	100%	LS	$ 1,000.00	Estimate	$ 1,000.00
2.3.2	Rain Gardens - media	130	m3	$ 138.30	Calculated using quote for media mix and quotes for other materials online	$ 17,979.00
2.3.3	Rain gardens - plants	180	m2	$ 27.00	Av. quote from CON 20/31	$ 4,860.00
2.3.4	Concrete Surround with reinforcement	82.4	m	$ 250.00	Estimate	$ 20,600.00
2.3.5	Cut to waste	180.0	m3	$ 60.00	Av tender rate CON 20/31. Assuming 1m excavation below garden	$ 10,800.00
2.3.6	Supply and install DN300 RCRRJ Class 2 pipe (incl. trench reinstatement), up to 1.0m deep	14	m	$ 423.06	CON 19/58 SPC ave tender rate 2.1.3	$ 5,922.84
2.3.7	DN600 manhole with low profile scruffy dome	2	ea.	$ 2,817.40	CON 20/38 av tender price 4.5.3	$ 5,634.80
2.3.8	Reseal road shoulder/replace pavers adjacent to new concrete surround	100%	LS	$ 2,000.00	Estimate	$ 2,000.00
2.3.9	Concrete capping around services	100%	LS	$ 3,000.00	Estimate	$ 3,000.00
2.3.10	Remove existing kerb and channel	3	m	$ 52.86	CON 19/65 rev 2 average tender price	$ 158.57
2.3.11	Supply and install sediment groove kerb and channel	3	m	$ 196.53	CON 19/65 rev 2 average tender price + 20%	$ 589.59
	Subtotal					$ 145,379.81
	Total					$ 162,825.38
	Professional fees (10%)					$ 16,282.54
	Contingency (25%)					$ 36,344.95
	TOTAL (GST EXCLUSIVE)					***$ 215,452.87***

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR DECISION

FILE NO and TRIM NO:	DRA-02-04/ 230321039464
REPORT TO:	UTILITIES AND ROADING COMMITTEE
DATE OF MEETING:	18 April 2023
FROM:	Jason Recker, Stormwater & Waterways Manager
SUBJECT:	87 Dunns Avenue Bank Improvements
SIGNED BY: (for Reports to Council, Committees or Boards)	Department Manager / Chief Executive

1. SUMMARY

1.1 This report seeks approval to carry out rock placement works along Kairaki Creek (Saltwater Creek) adjacent to 87 Dunns Avenue Bank in Pines Beach.

1.2 The property owner at 87 Dunns Avenue has contacted the Waimakariri District Council (WDC) regarding an erosion issue along Kairaki Creek adjacent to their property.

1.3 The property owner believes the erosion of the bank has increased due to drain maintenance performed by WDC over the past few years. They are concerned that the erosion along the bank is now threatening the structural integrity of their house (see attachment ii).

1.4 It was observed from a site visit that the property owner has previously attempted to stabilise the banks in two locations with chain fencing and rock. The property owner also purchased 18 concrete blocks (900 mm) and was proposing to have them installed along the bank adjacent to his property to mitigate any further erosion. Before installation of the concrete blocks, the property owner requested advice from Council staff regarding the required consents.

1.5 Council staff believe it is highly unlikely waterway maintenance has increased the erosion along the bank. This opinion is based on site inspection and reviewing historic aerials of this section of Kairaki Creek.

1.6 To maintain waterway capacity, it is necessary for the periodic removal of built-up sediment in waterways where sediment commonly accumulates, and periodic removal of vegetation that may grow into the waterway.

1.7 WDC is responsible for waterway maintenance and it appears there is a bank stability issue for this section of Kairaki Creek. Any works carried out by the Council are primarily for waterway management with the objectives being to improve waterway conveyance and minimise future maintenance costs.

1.8 Council staff obtained advice from AECOM with geotechnical and structural experience to review the concrete block solution, explore alternative solutions and consenting requirements (see attachment i). This advice was obtained in order for the landowner to

make a more informed position on potential options available to support the building and the consents required.

1.9 The concrete block option is not recommended by AECOM due to the considerable constructability, environmental, health and safety risk associated with this solution.

1.10 After an internal discussions it was determined that the placement of rock along the bank would improve the ability for Council to maintain this section of the waterway and may provide some mitigation to any future erosion. It will not however provide any substantial improvement to support the building.

1.11 The rock placement was outlined in AECOM's recommendation as an option that can be designed and constructed in accordance with the Canterbury Regional Council Code of Practice for Defences Against Water.

1.12 Rock placement for bank stabilisation is an effective erosion control practice for armouring slopes and channel banks. There are many benefits over most hard engineering techniques, including its ability to adjust to minor bed and bank movements, and its ability to integrate with vegetation.

1.13 The placement of rock along the bank from a constructability and cost standpoint is the recommended option (see attachment iii). The estimated cost for placement of rock along the bank is $25,000.

1.14 These works would be funded by the drainage maintenance allocation from the Better Off Funding.

ATTACHMENTS:

i. Aecom Recommendation Email (TRIM: 230321039465)
ii. Site Photos (TRIM: 230330044799)
iii. Proposed Improvements Map (TRIM: 230321039467)

2. RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** report No. 230321039464

(b) **Approves** the Council carrying out the rock placement works along Kairaki Creek (Saltwater Creek) adjacent to 87 Dunns Avenue Bank in Pines Beach for a sum of $25,000.

(c) **Notes** that this work will be funded by the drainage maintenance allocation from the Better Off Funding.

(d) **Notes** that $1,050,000 of the Better Off Funding was previously allocated by Council to 'Rural Land Drainage - Maintenance projects prioritised by staff in response to Climate Change' (refer TRIM 220911157300).

(a) **Circulates** this report to the Kaiapoi-Tuahiwi Community Board for their information.

3. BACKGROUND

3.1 The landowner at 87 Dunns Avenue, The Pines Beach has contacted the Waimakariri District Council (WDC) regarding an erosion issue along Kairaki Creek adjacent to the back of the property.

3.2 The property owner believes the erosion of the bank has increased due to drain maintenance performed by WDC's maintenance contractor over the past few years. They are concerned that the erosion along the bank is now threatening the structural integrity of the house (see attachment ii).

3.3 It was observed from a site visit that the property owner had previously attempted to stabilise the banks in two locations with chain fencing and rock. The property owner also purchased 18 concrete blocks (900 mm) and was proposing to have them installed along the bank adjacent to his property to mitigate any further erosion. Before installation of the concrete blocks, the property owner requested advice from Council staff regarding the required consents.

3.4 Council staff believe it is highly unlikely waterway maintenance has increased the erosion along the bank. This opinion is based on site inspection and reviewing historic aerials of this section of Kairaki Creek.

3.5 To maintain waterway capacity, it is necessary for the periodic removal of built-up sediment in waterways where sediment commonly accumulates, and periodic removal of vegetation that may grow into the waterway.

3.6 WDC is responsible for waterway maintenance and it appears there is a bank stability issue for this section of Kairaki Creek. Any works carried out by the council are for waterway management with the objectives being to improve waterway conveyance and minimise future maintenance costs.

3.7 Council staff obtained advice from AECOM with geotechnical and structural experience to review the concrete block solution, explore alternative solutions and consenting requirements (see attachment i). This advice was obtained in order for the landowner to make a more informed position on potential options available to support the building and the consenting required.

3.8 The concrete block option is not recommended by AECOM due to the considerable constructability, environmental, health and safety risk associated with this solution.

3.9 After an internal discussions it was determined that the placement of rock along the bank would improve the ability for Council to maintain this section of the waterway and may provide some mitigation to any future erosion. It will not however provide any substantial improvement to support the building.

3.10 The rock placement was outlined in AECOM's recommendation as an option that can be designed and constructed in accordance with the Canterbury Regional Council Code of Practice for Defences Against Water.

3.11 Rock placement for bank stabilisation is an effective erosion control practice for armouring slopes and channel banks. There are many benefits over most hard engineering techniques, including its ability to adjust to minor bed and bank movements, and its ability to integrate with vegetation.

4. ISSUES AND OPTIONS

4.1. Council has Two Options:

4.1.1 **Option One** – Council approves carrying out the rock placement works along Kairaki Creek adjacent to 87 Dunns Avenue in Pines Beach.

This **is** the recommended option for the following reasons:

- Council staff have identified that there is bank stability issue along this section of Kairaki Creek. The rock placement works would be in accordance with WDC's responsibility for waterway maintenance which include improving conveyance and minimising future maintenance costs.

- As a local authority, the Council is covered with Canterbury Regional Council Code of Practice for Defences Against Waters to perform the rock placement work.

4.1.2 **Option Two** – Council does not approve carrying out the rock placement works along Kairaki Creek adjacent to 87 Dunns Avenue in Pines Beach.

WDC maintains Kairaki Creek to ensure the hydraulic capacity of the channel is not compromised, this includes weed and silt removal and also addressing bank collapses. However, where buildings or other structures have been placed on the bank it is generally up to the property owner to put in measures to protect these assets. Council therefore could advise the property owner that this is a matter for them to address.

This is **not** the recommended option for the following reasons:

- If the bank erosion along the back of the property continues the Council will find it more difficult to undertake maintenance along this section of the stream.

- Based on consultation with the property owner, financially providing for a recommended alternative and the ECAN consent process is not feasible.

4.2. The Management Team have reviewed this report and support the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are not likely to be affected by or have an interest in the subject matter of this report.

5.2. Groups and Organisations

There are not groups and organisations likely to be affected by, or to have an interest in the subject matter of this report.

5.3. Wider Community

It is possible that performing these works could set a precedent that properties adjacent to waterways would expect improvements similar to those proposed in this report.

6. IMPLICATIONS AND RISKS

6.1. Financial Implications

6.1.1 The estimate for the rock placement work is $25,000.

6.1.2 These works would be funded by the drainage maintenance allocation from the Better Off Funding.

6.1.3 Better Off Funding is a package which supports the goals of the Three Waters Reform Programme by supporting local government to invest in the wellbeing of their communities in a manner that meets the priorities of both the central and local government.

6.2. Sustainability and Climate Change Impacts

6.2.1 The recommendations in this report have considered sustainability and climate change and do not have any adverse or direct impact.

6.2.2 87 Dunns Avenue in Pines Beach is in a high hazard area that is subjected to high sea level rise, increased risk of flooding and coastal inundation.

6.2.3 Any work carried out by the Council is primarily for waterway maintenance. It is not Council's responsibility to provide protection of private property from natural events and climate change.

6.3. Community Implication

6.3.1 There has been significant consultation with the property owner at 87 Dunns Avenue. Upon council's decision to carry out bank improvement works or not, the council will follow up with the property owner to inform them of the decision.

6.4. Risk Management

There are risks arising from the adoption/implementation of the recommendations in this report.

6.4.1 The rock placement work is in close proximity to the property's buildings.

6.4.2 If the Council approves carrying out the rock placement works, there is a risk of setting a precedent for Council to be financially responsible for other properties adjacent to waterways with erosion issues.

6.5. Health and Safety

6.5.1 There are not health and safety risks arising from the adoption/implementation of the recommendations in this report.

7. CONTEXT

7.1. Policy

7.1.1 This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. Legislation

7.2.1 This matter is covered under the Local Government Act.

7.3. Community Outcomes

7.3.1 The Council's community outcomes are relevant to the actions arising from recommendations in this report.

- There is a safe environment for all.

7.4. Delegations

7.4.1 The Utilities & Roading Committee has the delegated authority to approve physical works for Kairaki Creek adjacent to 87 Dunns Avenue in Pines Beach, as part of the Better Off Funding allocated to ‘Rural Land Drainage - Maintenance projects prioritised by staff in response to Climate Change’ as part of Approval to Submit Three Waters Reform - Better Off Application & Funding Agreement report refer TRIM 220911157300).

Jason Recker

From: Ray, Jeff <Jeff.Ray@aecom.com>
Sent: Tuesday, 13 December 2022 7:40 AM
To: Patel, Kiran; Jason Recker
Subject: RE: 87 Dunns Avenue Bank Stabilisation Advice

[THIS EMAIL IS FROM AN EXTERNAL SOURCE] DO NOT CLICK links or attachments unless you recognise the sender email

Hi Kiran and Jason,

Apologies for the delay.

Thank you for your query, please see some high level advice for the query on 87 Dunns Avenue. I've also noted a few assumptions below that will need to be confirmed / completed prior to any design or construction work being carried out on this site. Please note that further investigation is recommended prior to construction being completed.

Introduction:
It is understood that there has been erosion along the true left (north east) bank of Kairaki Stream adjacent to 87 Dunns Avenue in the Pines Beach area. The property owner is interested constructing mitigation measures to prevent erosion on the property along the stream bank. The mitigation measure proposed by the property owner is to place concrete blocks along the stream bank which is assumed to form a retaining structure along the stream.

The stream banks appear to be comprised of fine sediments based on the photos provided. These soil conditions are very susceptible to erosion and scour even at relatively low velocities. Armouring of the stream bank with concrete blocks is a potential solution but has a number of risks, namely under-cutting and scour at the ends of the armouring where it transitions to the existing channel.

Based on the proximity to the coast and the confluence with the Waimakariri River, it is assumed that Kairaki Stream is tidal. The daily changes in water levels can be enough to erode fine silty/sandy soils which appear to be present on this site. The flood flow / capacity of the stream is unknown. Further analysis is required to determine the tidal effects and flood impacts and the appropriate mitigation measures to prevent erosion without posing adverse effects on neighbouring properties.

Below, are tabulated options and potential risks associated with these options. There are planning considerations listed below that will apply to all options. Please note that this is only a high level review and therefore not all risks have been highlighted or investigated. Without more information, a recommendation cannot be provided. However, Option 3 – Stream Naturalisation and Option 4 – FlexMSE Vegetated wall will likely have the fewest risks and provide the best outcomes of the options assessed. Further investigation should be carried out prior to construction being undertaken.

Options and Associated Risk Discussion
Option 1: Concrete blocks (Landowner's proposed solution): To place 18 x 900 mm cubic concrete cubes. These cubes would be placed in the channel along the bank to prevent further erosion. **Viability (will it work):** It is assumed that this solution will consist of excavating the stream bank, placing extensive geotextile fabric and a suitable foundation material (thick layer of AP40 or similar) for the concrete blocks to bear on. The same cross-sectional area of the stream will need to be maintained to ensure that no filling within the waterway is undertaken that could reduce the capacity of the stream. This will in essence create a gravity retaining wall to

maintain the usable property area while providing a hard surface adjacent to the water in an attempt to prevent erosion.

While the face of the concrete blocks will provide a hard surface, the natural bank and bed material will still be suspetible to scour underneath and behind the blocks. The scour risk will be especially severe at the ends of the block wall. Here the stream banks change from a batter slope to a vertical face (of the block). This creates rills and flow turbidity leading to increased scour at each end.

Constructability:
This solution may present some constructability challenges. This includes the following:

- Deep excavation along an active waterway.
- Access to site for excavation.
- Safe lifting platform area to allow crane to move blocks into place.
- Integrating the wall into the adjacent buildings and driveway bridge abutment.

Aesthetics aside, while this option is likely cost effective this option has a lot of risks. This includes risk of scour, constructability issues, environmental issues.

Risks:

- **Constructability –** As stated above there could be some constructability issues around craning the blocks into place and excavating the banks of the river.
- **Scour:** As mentioned above, there is a risk of scour around the blocks and especially at each end of the block wall.
- **Health and Safety** – There is a health and safety risk during construction with craning the blocks into place and also the steel hooks will result in a tripping hazard that will need to be mitigated. Other risks could be present that haven't been mentioned here.
- **Planning** – There are numerous planning challenges especially around working within a waterway. This is elaborated on further below.
- **Environmental Risks –** There are several environmental risks associated with the construction and operations of the concrete block option. An environmental management plan will be required for construction. The hard surface is not the most environmental option in a natural waterway. If scour occurs this could pose a risk to the local environment which may include inanga (whitebait) spawning areas.

Option 2: Timber Retaining Wall: Construct a timber retaining wall along the bank of the stream to prevent erosion.

Viability:
Similar to the option above, the same cross-sectional area of the stream will need to be maintained to ensure that no filling within the waterway is undertaken that could reduce the capacity of the stream. Therefore, this option would be to install timber piles and timber planks to retain the existing bank of the stream similar to the option above.

This option has similar challenges to the option above. The challenge of the wall transitioning from vertical to a batter slope can be partially mitigated by flaring the wall inward at a 45 degree angle and burying the flared sections. Scour can still occur if not constructed properly. This option is constructed using modular pieces that are easy to fabricate on site which somewhat helps with constructability. This option is still fairly cost effective while maximising the usable land.

Constructability:
This solution may present some constructability challenges. This includes the following:

- Auguring piles adjacent to live waterway.
- Access to site for pile installation.
- Integrating the wall into the adjacent buildings and driveway bridge abutment.

Aesthetics aside, this option is reasonably cost effective and helps overcome some challenges. The risk of scour is reduced, constructability issues are reduced but still present, environmental issues may still be present.

Risks:

- **Constructability –** As stated above there some constructability issues are minimised. There may still be access issues for auguring the piles for the wall.
- **Scour:** As mentioned above, the scour risk around each end of the timber wall can be reduced using flared ends but scour risk is still present.
- **Health and Safety** – The health and safety risk during construction is reduced through the modular construction of the timber wall (no major lifting required). Other risks could be present that haven't been mentioned here.
- **Planning** – There are numerous planning challenges especially around working within a waterway. This is elaborated on further below.
- **Environmental Risks –** There are several environmental risks associated with the construction and operations of the timber retaining wall option. An environmental management plan will be required for construction. The hard surface is not the most environmental option in a natural waterway. If scour occurs this could pose a risk to the local environment which may include inanga (whitebait) spawning areas.

Option 3: Stream naturalisation: Excavate the eroded sections of stream bank to a flatter grade and vegetate the slope with appropriate species.

Viability:
Similar to the options above, the same cross-sectional area of the stream will need to be maintained to ensure that no filling within the waterway is undertaken that could reduce the capacity of the stream. A full naturalisation of the stream banks involves excavating the stream banks to a shallower batter and planting the stream banks with appropriate vegetation. The banks can also be lined with a bio-degradable matting to allow the plants to establish.

This option can tie into the adjacent embankments / vegetation to make for an easier transition through the eroded section of the stream bank. Vegetation provides the best protection against scour and erosion and provides a good environmental and aesthetic outcome. This option would require additional usable 'land-take' to provide the flatter batters without filling withing the stream cross-section. This may not be acceptable to the land owner.

Constructability:
This solution likely presents the least constructability challenges. There are a few challenges remaining including:

- Working adjacent to live waterway. This solution still provides reduced challenges.
- Access to site. Excavation along the stream bank will always be a challenge.

Risks:

- **Constructability –** As stated above this solution has the least associated constructability issues.
- **Scour:** As mentioned above, being a vegetated system provides the most scour protection.
- **Health and Safety** – This option provides health and safety risks during construction are mitigated the most (no major lifting required). Other risks could be present that haven't been mentioned here.
- **Planning** – There are numerous planning challenges especially around working within a waterway. Stream naturalisation will likely comply with most planning requirements.
- **Environmental Risks –** Being fully vegetated, stream naturalisation has the fewest environment risks as it will mimic the natural waterway.

Option 4: FlexMSE Vegetated Wall System: Construct a soil bag system that can be vegetated.
https://www.advancelandscape.co.nz/shop/Ground+Reinforcement.html

Viability:
Similar to the options above, the same cross-sectional area of the stream will need to be maintained to ensure that no filling within the waterway is undertaken that could reduce the capacity of the stream. The FlexMSE system is fully modular and can be constructed in areas that are difficult to access. They are smaller than the concrete blocks (and gabion baskets) and therefore would require less excavation.

This option can tie into the adjacent embankments / vegetation to make for an easier transition through the eroded section of the stream bank. Vegetation provides the most protection against scour and erosion. This option would still maximise usable land and is reasonably cost effect. This option is able to be vegetated which provides a better environmental outcome and aesthetic value.

Constructability:
This solution likely presents the least constructability challenges. There are a few challenges remaining including:

- Working adjacent to live waterway. This solution still provides the least challenges.
- Access to site. The fully modular system mitigates this challenges.

Risks:

- **Constructability –** As stated above, along with stream naturalisation, this solution has the least associated constructability issues.
- **Scour:** As mentioned above, being a vegetated system provides the most scour protection.
- **Health and Safety** – Being a fully modular system the health and safety risks during construction are mitigated the most (no major lifting required). Other risks could be present that haven't been mentioned here.
- **Planning** – There are numerous planning challenges especially around working within a waterway. This system will likely comply with most planning requirements.
- **Environmental Risks –** Being a vegetated system, the FlexMSE system has the fewest environment risks as it has the ability mimic the nature waterway.

Planning Considerations – Applies to all options listed above:

All options listed above come under the definition of defence against water:

Defence against water	means any structure or equipment, including any bu stopbank, retaining wall, rock or erosion protect (including anchored tree protection) or reservoir, th stopping, diverting, controlling, restricting or otherv

The applicable rule is below. The site is located within inanga spawning habitat so those timeframes would need to be avoided. Condition 3 of that rule couldn't be met if the landowner did the work themselves and WDC may be willing to do that work on behalf of the landowner. That would mean resource consent would be required for the landowner to install the concrete cubes. If earthworks are required it is likely a consent would be required from WDC also as the earthworks would be within 20m of a stream.

5.138 The installation, maintenance, use and removal of defence associated deposition of substances on, in or under the excavation associated diversions and discharges of sedimer bed of a lake or river is a permitted activity, provided the f

1. The activity does not prevent access in any way to la including defences against water; and
2. Other than for the use of defences against water the act bed of any river or lake listed as a high naturalness wat within a salmon spawning site listed in Schedule 17, or i during the inanga spawning season of 1 March to 1 June

Alternative solution:
If WDC were to get involved in an alternative solution, if timber walls, sheet piles, gabion baskets, FlexMSE vegetated wall or rock slope can be designed and constructed in accordance with the CRC Code of Practice for Defenses Against Water (attached), then it could be a permitted activity and not require resource consent from CRC. Assuming no extra earthworks would be required. If stream realignment was proposed, there would likely be more consent requirements around earthworks and vegetation within riparian margins, deposition in the bed of a river and diversions. Earthworks and potential requirements under the WDC District Plan in relation to the site being within a flood hazard zone would apply as the works are within 20m of a stream and could exceed volume/area limits.

Jeff Ray
M +64 21 675 612
jeff.ray@aecom.com

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From: Patel, Kiran <Kiran.Patel@aecom.com>
Sent: Monday, 12 December 2022 4:46 pm
To: Ray, Jeff <Jeff.Ray@aecom.com>
Cc: Jason Recker <jason.recker@wmk.govt.nz>
Subject: RE: 87 Dunns Avenue Bank Stabilisation Advice

Hi Jeff,

Please could you give Jason an update on 87 Dunns Ave.

Regards

Kiran

From: Jason Recker <jason.recker@wmk.govt.nz>
Sent: Monday, 12 December 2022 3:37 PM
To: Patel, Kiran <Kiran.Patel@aecom.com>
Subject: RE: 87 Dunns Avenue Bank Stabilisation Advice

Hi Kiran,

I wanted to check on the status of the 87 Dunns Ave. stabilisation advice.

I spoke to your colleague, Jeffrey about this while you were out. I believe he was going to have something put together within a couple of days. I unfortunately do not have his email. Could you check on this for me?

Thanks,

Jason Recker | **Stormwater and Waterways Manager**
3 Waters
Phone: 0800 965 468 (0800 WMK GOV)

DDI:+6432603516

WAIMAKARIRI DISTRICT COUNCIL

waimakariri.govt.nz

From: Jason Recker
Sent: Tuesday, 29 November 2022 11:14 AM
To: Kiran.Patel@aecom.com
Subject: 87 Dunns Avenue Bank Stabilisation Advice

Hello Kiran,

I have a landowner who is having erosion issues along the back of his property at 87 Dunns Avenue (see picture below). While the council believes this to be a private issue, we would like to offer him some high-level advice.

We are looking for roughly 1-2 days of work from AECOM that could provide us with high-level advice on the following:

1. Review of the landowner's proposed solution: The landowner has purchased 18 - 900 mm cubic concrete cubes. These cubes would be placed in the channel along the bank next to his house to prevent further erosion.
    a. Issues and challenges – constructability/long term issues
    b. Will it work?

2. Alternative solutions: timber walls, sheet piles, gabion baskets, rock slope, stream realignment (build out bank)
    a. High level pros/cons
    b. Rough cost estimate

3. Comment on the consenting for the landowner's proposed solution and recommended alternative solution.

Again, we are only seeking high-level advice (approximately 1-2 days of work). The purpose of this work is to give context to the landowner in terms of the approach they take. Could you let me know your availability and time frame to do this work? My understanding is it could be billed to the flood response work.

Please give me a call if you any questions on my mobile: 027 339 4316

Kind regards,

Jason Recker | **Stormwater and Waterways Manager**
3 Waters
Phone: 0800 965 468 (0800 WMK GOV)

DDI:+6432603516

WAIMAKARIRI DISTRICT COUNCIL

87 Dunns Avenue, The Pines Beach

Date: 21/03/2023
Author: jason.recker@wmk.govt.nz

Photo Map

0 2.5 5 7.5 10
Metres
Scale 1:235 @ A3

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Map Created by WAIMAP Utilities at 7:37:20 PM

Photo 1 - Kairaki Creek Bank adjacent to 87 Dunns Avenue

Photo 3 - Area between the Kairaki Creek Bank and the house at 87 Dunns Avenue

Photo 2

Concrete Cubes purchased by property owner for bank improvements.

WAIMAKARIRI DISTRICT COUNCIL

87 Dunns Avenue, The Pines Beach

Date: 21/03/2023
Author: jason.recker@wmk.govt.nz

Proposed Bank Improvements at 87 Dunns Avenue

0 2.5 5 7.5 10
Metres
Scale 1:235 @ A3

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Map Created by WAIMAP Utilities at 7:37:20 PM

WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR INFORMATION

FILE NO and TRIM NO:	EXT-01-19 / 230308032102
REPORT TO:	UTILITIES AND ROADING COMMITTEE
DATE OF MEETING:	18 April 2023
AUTHOR(S):	Don Young, Senior Engineering Advisor Peter Daly, Journey Planner / Road Safety Coordinator
SUBJECT:	Patronage figures for Public Transport Boardings from Park and Ride Sites

ENDORSED BY: (for Reports to Council, Committees or Boards)	General Manager	Chief Executive

1. SUMMARY

1.1. This report is to update the Utilities & Roading Committee on public transport patronage trends for the Park and Ride (P&R) sites within the district.

1.2. This information provides useful background when considering possible projects relating to multi-modal objectives.

2. RECOMMENDATION

THAT the Utilities and Roading Committee:

(a) **Receives** Report No. 230308032102;

(b) **Notes** the increase in boardings at these locations, over the past 18 months of Park and Ride operation;

(c) **Circulates** this report to the Rangiora Ashley Community Board and the Kaiapoi Tuahiwi Community Board for information.

3. BACKGROUND

3.1. During the 2020/21 financial year, several Park and Ride facilities were established in the district, and new “Direct” bus services was started by ECan, from both Kaiapoi and Rangiora.

3.2. The ‘Direct’ bus service is a very quick way to travel by bus from the Park and Ride facilities into Christchurch City, due to the limited number of stops along the route.

3.3. The Park and Ride facilities were established at;

a. Kaiapoi Central (near New World),

b. Kaiapoi South (off Wrights Rd),

c. Rangiora North (River Road),

d. Rangiora Central (White St) and

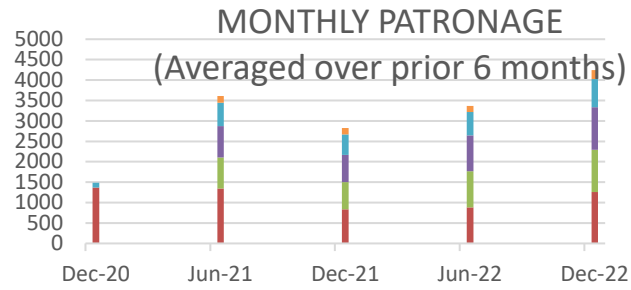
e. Rangiora South (South Belt).

3.4. It has been some time since the Council received updated patronage numbers from ECan. However, the attached information has now been received.

4. ISSUES AND OPTIONS

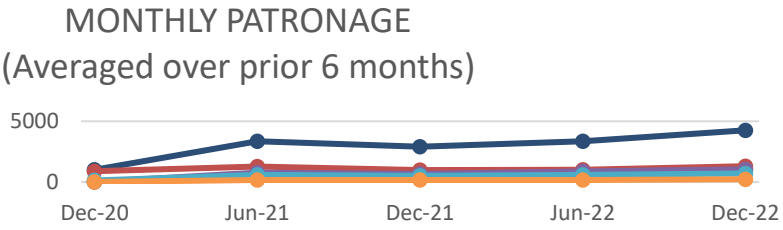
4.1. The data provided by ECan has been summarised in the graphs below.

4.2. It is noted that the White St and South Belt stops show some usage before the P&R service started. This was because these were bus stops under the original arrangements (prior to the Park & Ride sites being developed).



	Dec-20	Jun-21	Dec-21	Jun-22	Dec-22
Kaiapoi Southern Park and Ride	0	164	156	150	221
South Blt near Bush St	120	576	496	570	696
Northern Park and Ride (River Rd)	0	764	668	880	1037
Kaiapoi Central Park and Ride	0	764	668	880	1037
White St near Rata St	1365	1342	835	884	1257
TOTAL ALL PARK & RIDE STOPS	1005	3344	2911	3347	4259

TABLE 1 - Monthly patronage per P&R site



	Dec-20	Jun-21	Dec-21	Jun-22	Dec-22
TOTAL ALL DISTRICT BUS STOPS	17521	19420	15677	17036	20385
TOTAL ALL PARK & RIDE STOPS	1005	3344	2911	3347	4259
White St near Rata St	884	1257	985	1013	1297
Kaiapoi Central Park and Ride	0	584	606	735	1008
Northern Park and Ride (River Rd)	0	764	668	880	1037
South Blt near Bush St	120	576	496	570	696
Kaiapoi Southern Park and Ride	0	164	156	150	221

TABLE 2 - Monthly patronage of all P&R usage, plus per site

4.3. The main conclusions are that overall, the Park and Ride usage has increased significantly, albeit with a dip due to the impacts of Covid. Even with this dip, there has been a 27% increase over the last 18 months since the Park and Ride service was first established. (Note it is a 46% increase over the last 12 months since normal conditions resumed.)

4.4. The most popular sites are Rangiora North Park & Ride (River Rd), Rangiora Central (White St) and Kaiapoi Central (New World). All of these have shown a steady increase over the last twelve months.

4.5. It is also worth noting that total bus patronage (not graphed but shown in the top line of Table 2) has also increased. While there are ups and downs, it is an increase of 16% over the last 2 years (averaging at 8% per year).

4.6. In summary, the boardings at the Park & Ride sites have shown a steady increase over the last 1-2 years, indicating that the bus service being provided are being utilised by the public.

4.7. It is expected that a factor in this increase is the Governments subsidy on public transport, making the cost of public transport 50% less expensive to address the cost of living issue.

4.8. Environment Canterbury has a plan to introduce a lower cost fare structure on bus routes across Canterbury. However, introduction of this plan has been stalled by the Governments extensions of the half-price fare initiative. ECans plan will potentially be implemented once the Government's initiative is concluded.

4.9. Environment Canterbury is also progressing their involvement in the Governments National Ticketing Solution programme, a centralised, standardised approach to paying for public transport, and providing a common customer experience no matter where you are in the country.

4.10. As regards the Timaru MyWay bus programme, Environment Canterbury has indicated Waimakariri is geographically very different to Timaru, and does not lend itself to successful MyWay implementation.

Implications for Community Wellbeing

There are implications on community wellbeing by the issues and options that are the subject matter of this report. Having an efficient public transport service is an important element of providing good options to our community by supporting health & wellbeing, provides inclusive access and provides transport options other than private motor vehicle.

4.11. The Management Team has reviewed this report and supports the recommendations.

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are not likely to be affected by or have an interest in the subject matter of this report.

5.2. Groups and Organisations

There are no groups and organisations likely to be affected by, or to have an interest in the subject matter of this report.

5.3. Wider Community

The wider community is likely to be affected by, or to have an interest in the subject matter of this report. A well-informed community is critical to assist the Council making good forward decisions.

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

There are no financial implications of the decisions sought by this report.

6.2. Sustainability and Climate Change Impacts

The recommendations in this report do have sustainability and/or climate change impacts. Increasing the Council's investment in public transport, and increasing the community uptake, provides an important contribution towards greenhouse gas emissions reduction.

6.3 Risk Management

There are no risks arising from the adoption/implementation of the recommendations in this report, as it is only receiving information.

6.3 Health and Safety

There are no health and safety risks arising from the adoption/implementation of the recommendations in this report.

7. CONTEXT

7.1. Consistency with Policy

This matter is not a matter of significance in terms of the Council's Significance and Engagement Policy.

7.2. Authorising Legislation

Not applicable.

7.3. Consistency with Community Outcomes

The Council's community outcomes are relevant to the actions arising from the recommendations in this report, in particular ensuring *Transport is accessible, convenient, reliable and sustainable.*

7.4. Authorising Delegations

This Utilities & Roading Committee is the appropriate authority to consider this report.