WAIMAKARIRI DISTRICT COUNCIL

REPORT FOR DECISION

FILE NO and TRIM NO:	RDG-32-123-08 / 250319046056
REPORT TO:	COUNCIL
DATE OF MEETING:	1 April 2025
AUTHOR(S):	Rob Kerr, REL Programme Manager Joanne McBride, Roading and Transport Manager
SUBJECT:	Rangiora Eastern Link: Decision on preferred route
ENDORSED BY: (for Reports to Council, Committees or Boards)	General Manager / pp Chief Executive

1. SUMMARY

1.1. This report seeks Council approval for the preferred route of the Rangiora Eastern Link (REL).

1.2. The proposed arterial route has been planned since the 2001 Rangiora Transport Study and included in key planning documents such as the Canterbury Regional Land Transport Plan, Long Term Plan, and Proposed District Plan.

1.3. The attached Strategic and Economic Cases support this decision and will inform the request for co-funding from the National Land Transport Programme. The key transport challenges identified include:

1.3.1. Severe congestion due to growing traffic volumes.

1.3.2. Insufficient transport links for new growth areas, and

1.3.3. Increased travel volumes increasing safety risks.

1.4. Addressing these issues will improve travel times, reliability, safety, and support economic growth. The Economic Case assesses options to achieve these benefits. The analysis considers various solutions, concluding that expanding transport capacity is necessary. A shortlist of routes has been developed.

1.5. Elected members and community stakeholders provided feedback on the shortlist of options, summarised in the report. Input from affected landowners was also sought and correspondence is appended to this report. A cross-agency group, including Council, NZ Transport Agency, and Ngāi Tūāhuriri representatives[1], assessed the shortlisted options against investment objectives and key criteria and this has led to this recommendation.

1.6. The assessment supports adopting the designated route west of the Wastewater Treatment Plant (WWTP) but notes that all three shortlisted eastern options also achieve investment goals. Key findings include:

[1] Mandated staff from Whitiora on behalf of Te Runanga o Ngāi Tūāhuriri

1.6.1. All shortlisted options improve congestion and travel reliability.

1.6.2. Widening Southbrook Road is the least cost option but has negative impacts, including increased traffic, community severance, and safety risks. It is not recommended.

1.6.3. An arterial link to Youngs and Fernside Road was considered but is not recommended due to higher costs and greater impacts on residents and the environment.

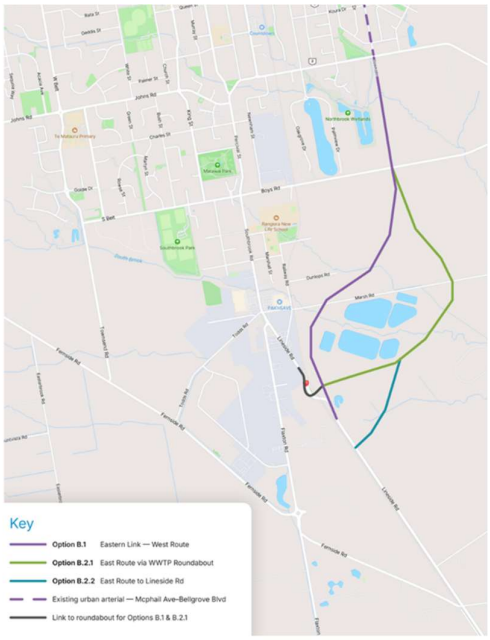
1.6.4. Eastern link variations show strong economic outcomes with high benefit-cost ratios.

1.6.5. Option B.2.1 has partial landowner support but also some opposition

1.6.6. Eastern routes (B.2.1, B.2.2) avoid creation of residual triangular land parcels on the north side of Marsh Road.

1.6.7. The Lineside Road connection (B.2.2) is rated slightly lower due to impact on a high-value waterway and lack of a level crossing upgrade.

1.6.8. The eastern routes (B.2.1, B.2.2) reduce usable WWTP land available for future expansion[2] by approximately 4ha, while the designated route (B.1) would reduce usable land by approximately 2.5ha.



1.7. The choice is between the designated west route (B.1), which minimises delivery risks, and the eastern route (B.2.1), which benefits urban form.

1.8. If WWTP constraints and landowner impacts are prioritised, the west route (B.1) is preferred. If urban form and development potential are given more weight, the east route (B.2.1) is preferable.

1.9. As the designated route is already in the Proposed District Plan, the eastern option would need materially greater benefits to be preferred. Staff conclude that the constraints on WWTP expansion and landowner impacts outweigh the urban benefits of the eastern route. Therefore, the recommended option is B.1 (west of WWTP).

1.10. To improve safety and avoid extensive upgrading of Station Road, the concept design is proposed to exclude a westbound connection from REL to Marsh Road.

Attachments:

i. Multi criteria analysis
ii. Summary of traffic impacts
iii. Correspondence from neighbours
iv. REL Transport Assessment of Options (Trim no. 250319046069)
ii. REL - Strategic and Economic cases (Trim no. 250319046050)

[2] For clarity, this is for expansion beyond what is currently required in the next 50 years

2. RECOMMENDATION

THAT the Council:

(a) **Receives** Report No. 250319046056.

(b) **Adopts** Option B.1 Rangiora Eastern Link, west of Wastewater Treatment Plant (WWTP) as the preferred route for the Rangiora Eastern Link

(c) **Agree** that the Concept Design does not include a connection from the REL to Marsh Rd westbound.

(d) **Endorses** the Rangiora Eastern Link Strategic and Economic Cases. (250319046050)

3. BACKGROUND

3.1. The Rangiora Transport Study (2001) identified the need to relieve congestion and service growth areas in the future and proposed the Rangiora Eastern Link (REL) and other interventions as a package of measures. A Scheme Assessment Report (2005) advanced investigations of a route for the proposed Rangiora Eastern Link including an initial capital cost estimate.

3.2. A series of planning processes, notably the East Rangiora Structure Plan and subsequent Outline Development plans each show the REL as fundamental to the development of east Rangiora.

3.3. A Notice of Requirement (2021) was prepared for the Proposed Waimakariri District Plan to establish a Designation for the land required for a route west of the Wastewater Treatment Plant. A range of technical studies were completed to address potential areas of risk and environmental impact to support the Notice of Requirement.

3.4. Development Contributions were agreed with the developers Bellgrove through a Private Development Agreement, and these are now reflected in the Development Contributions Policy, with growth to fund 50% of the $35 million cost estimate. Parts of the Rangiora Eastern Link north of Northbrook Road have already been constructed (or will be constructed) through agreement with developers as part of the subdivision process for residential land.

3.5. While the project was not included in the 2024-27 National Land Transport Plan, co-funding for the Business Case and Concept Design was confirmed by NZ Transport Agency in December 2024.

3.6. The 2024-27 Long Term Plan includes allowance for the project, with construction in FY28 and FY29, noting that, following community feedback, this is dependent on receiving co-funding from the National Land Transport Plan

3.7. Further technical studies, including Intersection modelling (2024), concept development for key locations (Koura Creek and Lineside Road intersection), soil contamination and a Transport Assessment have been prepared in support of the Business Case and the decision being invited by this report.

3.8. An Investment Logic Map workshop was held with membership of elected members and senior staff from NZ Transport Agency and Council, to inform the strategic case and the decision making that is subject to this report.

3.9. Finally, following a competitive tender process, WSP has been commissioned to prepare the concept design, subject to confirmation of the route of the REL

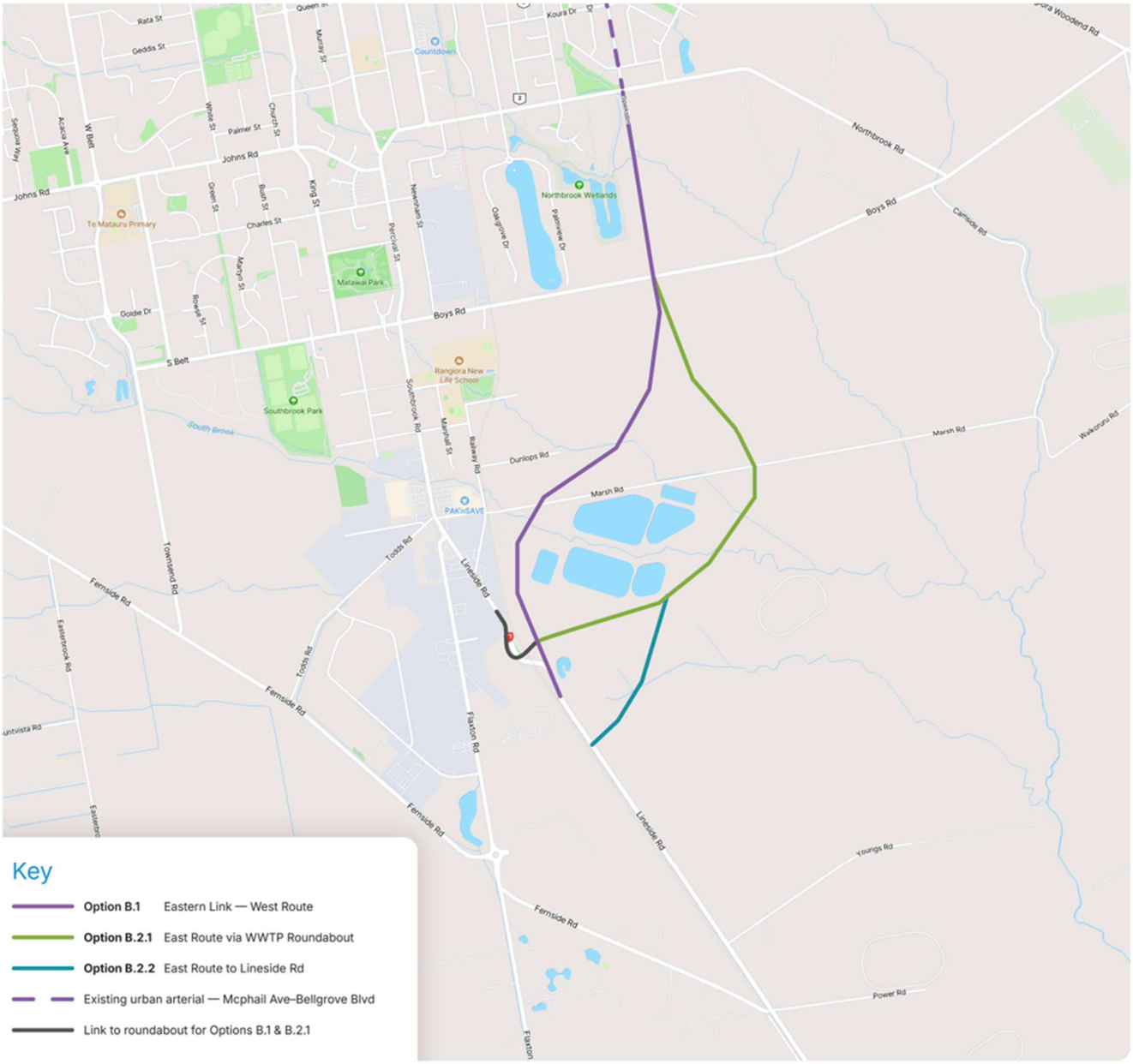
4. ISSUES AND OPTIONS

4.1. The key decision being invited through this report is the route of the Rangiora Eastern Link. There are four shortlisted options:

- Option A Four laning Southbrook Rd
- Option B.1 REL, west of WWTP
- Option B.2.1 REL, east of WWTP
- Option B.2.2 REL directly to Lineside Rd

4.2. To aid clarity, these are differentiated in the text as:

- REL Options (B.2.1, B.2.1, B.2.2)
- West vs. East of WWTP (specific comparison between B.1 and B.2.1)
- Direct to Lineside Road (B.2.2)



Understanding different viewpoints

4.3. A drop-in session with Elected Members was held on 19th February. There was a range of views expressed at the session and written feedback received from nine members only.

4.4. Of those who provide written feedback, there was support for route REL directly to Lineside Road as well as the other REL options, with no support for four laning Southbrook Road. This is summarised in the table below:

		Preferred	Support also	Oppose	Comment
A	Four laning Southbrook Rd				
B.1	REL, west of WWTP	2		1	Expected by community
B.2.1	REL, east of WWTP	2	2	1	
B.2.2	REL directly to Lineside Rd	4	1		Lowest cost
Alt option	REL to Fernside Rd	1	3		Resolve issue at Fernside Rd also

4.5. Feedback from immediate neighbours is varied and written correspondence has been received from several, and these are appended to this report.

4.5.1. The response from the neighbours along the southern boundary of the Wastewater Treatment Plant is varied, with three either supporting or not opposing all the routes (REL east or west of the plant), with one opposed to the REL routes east of the WWTP routes (B.2.1 and B.2.2) which would bring the road nearer to their property.

4.5.2. One owner prefers the routes which are further away, for example Option B.2.1 or a more eastern route again but accepts the closer option subject to mitigation of safety and access for their property.

4.5.3. The Spark family, as landowners to the north of Marsh Road and to the east of the Wastewater Treatment Plant, support the REL east of the WWTP options, and their email is attached which sets outs their reasons. This less impact on the farming operation and avoiding creation of triangular shaped land parcels as well as a more welcoming entrance centred around the values of the Southbrook and Middlebrook Streams.

4.5.4. The owners of the land that would be bisected by the REL directly to Lineside Road has stated that the farming may not be viable in the medium term and encourages Council to take a long-term view on the options.

4.6. It is noted that an arterial link to Youngs and Fernside Road was considered in the long list and could assist in resolving the known safety issue at Fernside Rd, however is not recommended due to the materially increased cost, lower benefit cost ratio and high impact on private property and people living in the area.

4.7. The impact of this longer alternate route would mean that land acquisition and consenting of the project is likely to be difficult, particularly as there are viable and effective alternatives that do not result in the same level of impact.

4.8. To support Council in their decision making, a cross-agency group of senior staff from Council, NZTA and Whitiora (on behalf of Ngāi Tūāhuriri) assessed the short-listed options against a series of criteria ranging from the investment objectives, key success factors, risk, cost as well as economic metrics including the benefit cost ratio. This is summarised in the following paragraphs with the detailed multi-criteria analysis included as an attachment.

Consideration of four laning of Southbrook Road

4.9. Option A: Four laning of Southbrook Rd is physically possible and would be able to be achieved within the existing road reserve. To assist understanding, this is similar to the design of Curletts Road in West Christchurch.

4.10. However, it does not deliver the full range of benefits and would result in increased severance, poor outcomes for cyclists, reduced accessibility for business and residents accessing the corridor, and heightened risk for pedestrians, and particularly children crossing the road.

4.11. Despite Option A being the lowest cost option ($21 Million), it has a much lower benefit cost ratio (2.0) than the other options and hence is not considered to provide the value for money that investment in the REL would provide.

4.12. On that basis, it is recommended that this option is not considered further, and the remainder of this discussion focuses on the three shortlisted variations of the REL.

How well does each option achieve the objectives of relieving congestion, serving growth and improving safety

4.13. A Transport Assessment with associated traffic modelling has been prepared for the project. This is included as the attachments along with a summary plan of the modelling outcomes.

4.14. The analysis found that the Rangiora Eastern Link:

- Supports the growth of up to 5,000 new homes in East Rangiora
- Provides 3-4 minutes in lower travel time from East Rangiora (300-400 hours each day)
- Saves approximately 7,000 kilometres per day (VKT) in driving distance, leading to consequent sustainability benefits.
- Reduces the traffic volume across Lineside Road level crossing down from 17,600 vpd (vehicles per day) to 11,000 to14,000 per day (depending on the option)
- Limits traffic volume to 19,200 vpd on Lineside Road instead of 23,000 vpd today.
- And maintains a population of approximately 40,000 people within 10 minutes' drive of Southbrook and its employment and retail opportunities.

4.15. In summary, the analysis found that each of the shortlisted options provides good benefits in terms of travel time and reliability with some relatively minor variation in resulting traffic volumes and intersection delays.

4.16. As such, the decision on which route to progress should be based on the ability to deliver the project and the impact of each option.

Is the project likely to be funded and delivered?

4.17. Any project needs to be (1) affordable, (2) provide value for money, and (3) be able to be delivered. These are the critical success factors.

4.18. The three shortlisted REL options each have similar and very promising benefit cost ratios and total forecast costs and hence can be considered to provide value for money. Further, because they are similar to the current budget and 50% of funding is likely to come from

development contributions, they each provide excellent value for money for public investment (ratepayer and taxpayer) and so are considered affordable.

4.19. In terms of risks to delivery, a key difference between the two shortlisted REL options to the east of the WWTP and the route to the west of the plant (along the designation in the proposed district plan) is the effect on people and property and related risk to delivery of the project.

4.19.1. Whereas the route west of WWTP is distant from residential property and primarily passes through land owned by the Council or the Spark Family (with land proposed for rezoning), the two routes east of the WWTP pass immediately adjacent to several existing residential properties and, in the case of the route directly to Lineside Road, requires acquisition of private land that has not previously been identified.

4.19.2. As noted above, one landowner opposes the route east of the WWTP, while all landowners are comfortable or do not oppose the route west of the WWTP. The Spark Family prefer the route east of the WWTP and the landowner affected by the route directly to Lineside Road may be a willing seller and does not see farming the land as viable in the long term.

4.19.3. If Option B.1 west of the WWTP is preferred, which follows the designation in the proposed District Plan, limited resource consents[3] are required, there is some distance to neighbours and land acquisition is more assured.

4.19.4. Conversely, a full consenting[4] and land acquisition process will need to be advanced for work outside the designation. Further, the two routes east of the WWTP pass close to existing homes and (for option B.2.2) require land acquisition on land not previously identified.

4.19.5. In other projects, this would be expected to raise the risk of drawn-out consenting and land acquisition processes that may not be successful due to the impact on neighbours and property owners. However, in this case, the feedback from neighbours indicates that there is support for all routes from most landowners, with one opposing.

Is there a difference in terms of impacts or opportunities?

4.20. The environmental impact and the impact on Te Ao Maori are similar across Options B.1 West of WWTP and B.2.1 East of WWTP, with only the option B.2.2 (direct to Lineside Road) being scored lower due to crossing an additional high value waterway[5].

4.21. Option B.2.2 Direct to Lineside Rd has a slightly lower safety score due to maintaining, rather than upgrading, the existing level crossing.

4.22. As noted above, there is impact on the neighbours of the eastern routes due to the proximity to homes, albeit that this is moderated somewhat by the support of some of these neighbours.

4.23. The two variations of eastern link that pass to the east of the Wastewater Treatment Plant would avoid creating triangular shaped parcels adjacent to Marsh Road (noting that land

[3] An Outline Plan will need to be prepared and submitted, however provided that the proposal aligns with the notice of requirement then this is unlikely to be declined. Some consents may be required for the length of new road south of the dual roundabout (Lineside/Southbrook)
[4] Note that the project was not accepted to be included in Schedule 2 of the Fast Track Approvals ACT.
[5] South-Southbrook Stream

use is constrained due to proximity to the wastewater plant) and perhaps better support any future urban expansion to the east beyond the proposed district plan horizon.

4.24. Finally, a key consideration is that the routes both east and west of the Wastewater Treatment would each impact operations and constrain the ability of the wastewater plant to be extended.

4.24.1. The cost of relocating the operations yards, including the civil defence and animal shelter, has been allowed for in the cost estimates for the route west of the Wastewater Treatment Plant and a re-configuration of the area would bring benefits.

4.24.2. The potential constraint on future expansion of the wastewater plant beyond the current 50 year planning horizon created by a route east of the wastewater treatment plant may be material as it would reduce the useful land available for expansion by 4ha.

4.24.3. While the loss of useful land by the route west of the wastewater treatment plant would be approximately 2.5ha, however this shape is long and narrower, being located alongside the railway line.

Staff Recommendation

4.25. It is fair to conclude that there are not compelling reasons to prefer one shortlisted route option for the Rangiora Eastern Link over another. They each will deliver the transport benefits, provide value for money and are similar in cost. However, there are differences between each option with pro's and con's which should be considered.

4.26. The two options which avoid crossing the South-Southbrook Stream to link directly to Lineside Road are preferred as they lead to an upgraded level crossing, reduce impacts on both the environment and Te Ao Maori, and avoid the need to acquire and sever a large farm paddock.

4.27. The two remaining route options - east or west of the wastewater plant - can be distinguished by their respective benefits and impacts. The eastern route offers advantages for urban form by avoiding residual triangular shaped land parcels north of Marsh Road, while the western (designated) route has a lower impact on the future expansion of the Wastewater Treatment Plant and presents a lower risk to project delivery.

4.27.1. As the potential constraint on expansion of the Wastewater Treatment Plant, impact on residential properties south of the wastewater plant, and the associated risk to obtaining consents, is considered a higher priority, then Option B.1 (West of WWTP) is the recommended option.

4.27.2. If benefits to urban form and future industrial development scenarios were given greater weight, then Option B.2.1 (East of WWTP) could be considered.

4.28. Given that the designated route is included in the Proposed District Plan, staff suggest that the benefits of the eastern route would need to significantly outweigh those of the designated route to justify a change in preference. While the eastern route does provide tangible benefits to urban form by avoiding creating triangular shaped parcels, staff do not consider these benefits sufficient to override concerns related to impacts on future expansion of the Wastewater Treatment Plant, people, property, and project delivery risk.

4.29. Therefore, staff recommend Option B.1 (REL west of the WWTP, designated route) as the preferred option.

Connection to Marsh Road

4.30. A consideration regardless of which option to be progressed, is that an intersection of Marsh Rd and the REL would create a new route to Pak'nSave and Southbrook Road, that would create safety issues. The rail crossing at Marsh Road is already a sub-standard rail crossing with a very poor safety record and the dramatic increase in traffic (6,000 vpd) would require significant investment to upgrade this level crossing, as well as re-configuration of Station Rd and a new signalised intersection at Southbrook Road.

4.31. The cost of this work would be significant but would bring marginal benefit over the route created by the REL. As such, staff recommend that the Concept Design is prepared on the basis that there is no westbound connection from the REL onto Marsh Road.

4.32. For the avoidance of doubt, there would be an eastern connection (towards the Cam River and Tuahiwi). Access to the Wastewater Treatment Plant and other neighbouring properties would remain via Marsh Rd (west) from Station Road as currently. Those wishing to travel towards Rangiora would use the Rangiora Eastern Link and access Southbrook via the roundabout at the southern end of the new road link.

Implications for Community Wellbeing

There are implications on community wellbeing by the issues and options that are the subject matter of this report. In particular, some route options have a greater impact on individual residents and their property than others, while the benefits of the REL for the overall community are material.

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

5. COMMUNITY VIEWS

5.1. Mana whenua

Te Ngāi Tūāhuriri hapū are likely to be affected by, or have an interest in the subject matter of this report.

Whitiora, on behalf of Ngāi Tūāhuriri, have participated in the assessment of these options that have led to this advice. They support the recommendation in this report noting that they do not have a preference between the routes to the west or east of the wastewater plant (options B.1 and B.2.1).

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. NZTA have participated in the workshops that have led to this advice and are co-funding the project.

There is a financial interest for the developers in East Rangiora and the wider district, and this is reflected in the development contributions levied for the project.

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 as the benefits of the project extend

6. OTHER IMPLICATIONS AND RISK MANAGEMENT

6.1. Financial Implications

The current schedule of Development Contributions shows two DC's levied for the REL:

- A DC of $3,352 /lot + GST on all new lots created in the Outer East Rangiora development area, and
- A further DC of $1,942.01/lot + GST on all new lots created in the District.

These contributions are forecast to fund 50% of the $35 million estimated project cost. The balance of the 50% is anticipated to be co-funded (51%) by the National Land Transport Plan, noting that this is subject to decisions in 2027.

In the Long Term Plan, the Rates funded potion (LoS) is forecast at $8.58 Million and included for construction in FY28 and FY29.

Capital Cost		$35 M	
Less Development Contributions	District Wide	$8.76 M	25% 4950@ $1942/lot
	East Rangiora	$8.76 M	25% 2614@ $3352/lot
Residual Cost of project		**$17.5 M**	
		⇩	
Local share (LOS rates)	49%	$8.58M	
NLTP share	51%	$8.92M	

6.2. Sustainability and Climate Change Impacts

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

- Reduction in 7,000 kilometres travelled per day (VKT), leading to reductions in carbon emissions,
- Travel time reliability will increase the attractiveness of public transport,
- An alternative public transport route, and
- strengthen active transport connection through the east of the town.

6.3 Risk Management

There are risks arising from the options in this report and these are set out in the main body.

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

The Land Transport Management Act, and Local Government Act are relevant in this matter.

7.3. **Consistency with Community Outcomes**

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

The following outcomes are applicable:

Environmental

…that values and restores our environment…

- *The natural and built environment in which people live is clean, healthy and safe.*

Economic

…and is supported by a resilient and innovative economy.

- *Infrastructure and services are sustainable, resilient, and affordable.*

Social

A place where everyone can have a sense of belonging…

- *Our community has equitable access to the essential infrastructure and services required to support community wellbeing.*

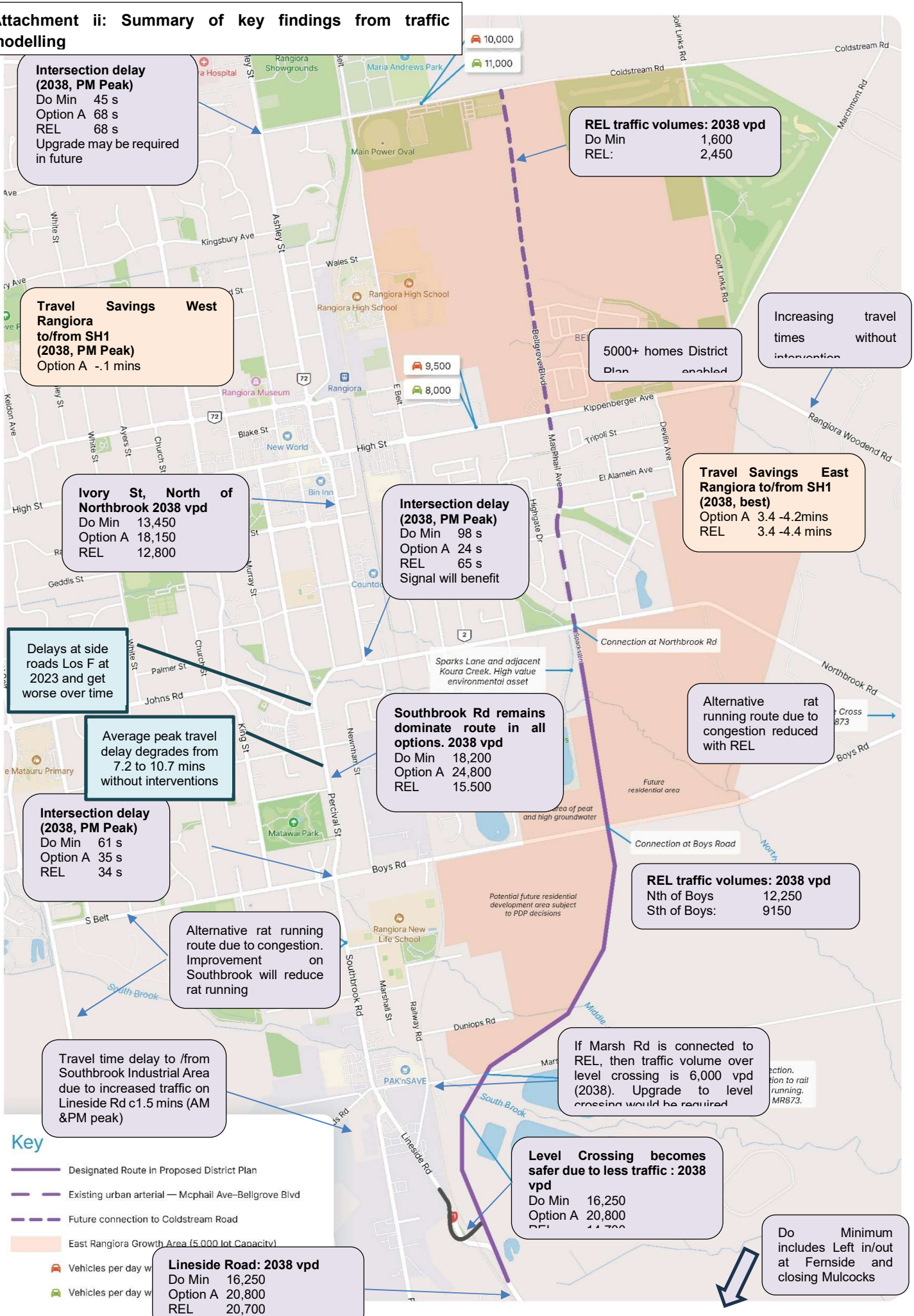
7.4. **Authorising Delegations**

The Council has the authority to receive this report and approve the preferred route of the Rangiora Eastern Link Road.

Attachment i) Multi Criteria Analysis undertaken to support decision making on route of the Rangiora Eastern Link

Type of Criteria	Criteria	Considerations	Option A: Four Laning Southbrook Road	Option B.1 : REL west of WWTP (designated route)	Option B.2.1 REL east of WWTP	Option B.2.2 REL east of WWTP to Lineside Rd
Investment Objectives	Improve accessibility from East Rangiora development area to SH1 by 3 minutes by 2038 (30%)	Measure 1: Travel time improvement from Area of East Rangiora greenfield land to SH1 (Lineside Road) Measure 2: Proportion of population living within 10 mins (am peak) of Southbrook Industrial Area (%) Measure 3: Reduce sideroad delays accessing Southbrook Road (secs)	2	2	2	2
	Reduce am peak travel time between Lineside and Northbrook Road by 40% by 2038 (55%)	Measure 1 Proportion of population within 10 mins of Southbrook Measure 2 Time to travel from Southbrook to Northbrook Road (Mins) Measure 3:Improvement in travel time reliability (comparing peak to inter-peak) (%)	2	2	2	2
	Improve the Infrastructure Risk Rating on strategic roads in South Rangiora to Medium or better by 2038 (15%)	Measure 1: Number of deaths and serious injuries Measure 2: Infrastructure risk rating > medium Measure 3: Ease for locals to cross the road (and access)	-2	2	2	1
Critical success factors	Affordability	Current budget is $35 million	2	1	1	1
	Deliverability (achievability)	Note advice in slide pack, Consenting, schedule, construction and land acqusition key risks	2	2	0	0
	Value for money	Economic metrics below	1	3	3	3
Opportunities and Impacts	Te ao Māori	Workshop deliberations	-1	-1	-1	-2
	Environment and ecology	Workshop deliberations	-1	-1	-1	-2
	Social and Landscape	Workshop deliberations	-3	1	1	1
	Private Property and immediate neighbours	Workshop deliberations	-3	2	0	-1
Economic indicators	Benefit Cost Ratio	Stantec Economic Assessment	2	4.8	4.3	5.0
	BCR (Govt)	Stantec Economic Assessment	2.2	7.7	6.7	8.0
	Net Present Value ($millions)	Stantec Economic Assessment	33.6	223.8	194.6	221.2
	First year rate of return	Stantec Economic Assessment	6%	5%	6%	3%
Cost	Capital Cost (P_{50}-P_{95})	Programme Manager	$21.5 -$31M	34.9- 52.4 M	$35.7 - 53.6M	$32.9 - 49.4 M
	Public sector cost (P50-P95)	Programme Manager	$5.4 - $7.75	$17.5 - 26.2 M	$17.9 - 26.8M	$16.5 - 14.7M

Attachment ii: Summary of key findings from traffic modelling



Intersection delay (2038, PM Peak)
Do Min 45 s
Option A 68 s
REL 68 s
Upgrade may be required in future

REL traffic volumes: 2038 vpd
Do Min 1,600
REL: 2,450

Travel Savings West Rangiora to/from SH1 (2038, PM Peak)
Option A -.1 mins

5000+ homes District Plan enabled

Increasing travel times without intervention

Travel Savings East Rangiora to/from SH1 (2038, best)
Option A 3.4 -4.2mins
REL 3.4 -4.4 mins

Ivory St, North of Northbrook 2038 vpd
Do Min 13,450
Option A 18,150
REL 12,800

Intersection delay (2038, PM Peak)
Do Min 98 s
Option A 24 s
REL 65 s
Signal will benefit

Delays at side roads Los F at 2023 and get worse over time

Average peak travel delay degrades from 7.2 to 10.7 mins without interventions

Southbrook Rd remains dominate route in all options. 2038 vpd
Do Min 18,200
Option A 24,800
REL 15.500

Alternative rat running route due to congestion reduced with REL

Intersection delay (2038, PM Peak)
Do Min 61 s
Option A 35 s
REL 34 s

REL traffic volumes: 2038 vpd
Nth of Boys 12,250
Sth of Boys: 9150

Alternative rat running route due to congestion. Improvement on Southbrook will reduce rat running

Travel time delay to /from Southbrook Industrial Area due to increased traffic on Lineside Rd c1.5 mins (AM &PM peak)

If Marsh Rd is connected to REL, then traffic volume over level crossing is 6,000 vpd (2038). Upgrade to level crossing would be required

Level Crossing becomes safer due to less traffic : 2038 vpd
Do Min 16,250
Option A 20,800

Do Minimum includes Left in/out at Fernside and closing Mulcocks

Lineside Road: 2038 vpd
Do Min 16,250
Option A 20,800
REL 20,700

iii. Correspondence from neighbours

484 Lineside Road
(affected by Option B.2.2 Direct to Lineside Rd)
From email received 13 March 2025

To whom it may concern.

Having met with Rob and Anna last week to view the options for the Rangiora Eastern Link Route. I was invited to write a letter expressing my thoughts. As I said to them short to medium term I didn't see my property as a viable farming option. Rising costs of compliance, rates, power and general expenses is eroding any potential profit margins. So short to medium term I see the property in some sort of housing/ lifestyle development.

How this is affected by the Eastern Link Road is the unknown. Personally I think the council needs to look more into the future rather than short term fixes. Population growth is inevitable for the Rangiora and surrounding district. The roading needs to represent that future outcome. If you have travelled to overseas countries you will understand how poor our roading infrastructure is.

As far as my property is concerned regarding the Eastern Link Route, I ask that thought is given to how this can work in with the best use of the land. And hence not devalue the asset that already exists but add to it.

Regards Richard Smith
12 March 2025

Spark Family
Email received 12 March 2025

Dear Mayor Dan Gordon and Councillors,

Re: Council: Meeting 1 April 2025

We understand that the realignment of the Rangiora East Link Road (REL) will be discussed at the above Council meeting. We would like to make a statement to be noted at the above meeting regarding this matter. Our points are:

Our family owns the land between Spark Lane and Marsh Road including a southern boundary with the Southbrook Stream south of Marsh Road. Over recent years we have had several meetings with WDC staff regarding the pending REL, have been supportive of the concept, and have contributed ideas on alignment with WDC Engineers.

We are in support of the REL as we believe Rangiora needs an alternative entrance from the south. The REL will ease the congestion in Southbrook and also provide Rangiora a prime opportunity to create an aesthetic and welcoming main entrance to the town.

We see the construction of this route as a priority for Rangiora and are keen to continue to work with the Council in order to start construction as soon as possible.

Currently the REL designation south of Boys Road is for the REL to curve in a south west direction and run between the wastewater ponds and the railway before joining up with Lineside Road.

We believe that this original designation is not the best alignment for the REL.

We believe the REL should go to the east of the wastewater ponds. **This will;**

1. Provide a more convenient boundary line for our remaining dairy farm land. The original alignment would create a triangle south west corner boundary to the farm which will be inefficient to farm and require a new bridge over the Middlebrook Stream.

Alternatively, if the REL travels relatively straight from Boys to Marsh Road, and east of the wastewater ponds as we suggest, although heavily impacted, it leaves our farm with a straighter and more functional boundary.

2. Provide superior future opportunity for land development to the east and west of the REL. We understand that the medium to long term growth modelling for Rangiora and the Waimakariri District predicts future eastern growth between Rangiora and Woodend/Ravenswood. We believe the alignment of the REL needs to take a long term view, as the REL will be critical to facilitate future growth to the east of Rangiora.

3. The area between the Southbrook and Middlebrook Streams provides a great opportunity for biodiversity, recreation such as walkways and dog park, as well as an aesthetic and welcoming entrance into Rangiora. We believe the REL alignment east of the wastewater ponds provides a great opportunity for the town to be able to enhance these two lowland, spring fed waterways and create a very appealing entrance to Rangiora.

4. There is a considerable amount of WDC infrastructure either on, under, or adjacent to the original designation between the wastewater ponds and railway line. If the REL goes east of the wastewater ponds as we suggest, the WDC infrastructure should not be affected.

5. Alignment of the REL to the east of the wastewater ponds will create a more functional shaped area of potential Light Industrial zoned land between the wastewater ponds and our proposed future residential development further north.

Summary

Thank you for the opportunity to share our views on the future alignment for the REL. The REL is an exciting project for Rangiora and we believe the REL alignment on the eastern side of the wastewater ponds is in the best long term interests of the district.

Yours sincerely

Richard and Geoff Spark
Spark Bros Ltd

SJ & CE Hannah feedback on REL Project
570 Lineside Road
Received 17 March 2025

We would like to submit the following feedback in relation to the Rangiora Eastern Link (REL) Project. We thank Rob Kerr and the Waimakariri District Council for the opportunity to meet with them on the evening of Monday 3rd March 2025 to be advised of the proposal. Given the very short (2 week) time allowed for us to provide our feedback on the project proposal, this feedback is not as comprehensive as we would have liked it to be.

Our comments on some of the options proposed:

Long term, we believe that option C would be the most effective in servicing the needs of the residential spread to the Northeast of Rangiora, however we note that this is not included in the shortlist of options proposed. Our reason for this is covered below under General comments.
Financially it appears that Option A would be the most cost-effective solution, however we note and agree with the comments made about the potential opposition to this from land owners making it prohibitive and also do not believe that long-term, this would be the best solution as it would simply "move the problem" (the congestion) further up the road.
Option B.2.1 we believe to be a suitable option and would not have a significant impact on ourselves or our property, we would support this as an option, however we understand and agree that there is the potential for opposition from other affected landowners which may exclude this.

We see that option B.1 appears to be the preferred route and offers the "path of least resistance" to resolve the congestion issues faced by Southbrook.
As an affected party to this option, we agree that this is beneficial and have, since purchasing our property in 2007 known that this project was in the planning and at least part of the reason that Waimakariri District Council retained a parcel of land from the front of our property during the sale to us (having originally purchased this property some time prior with this plan in mind).

As an affected party, we submit the following feedback, comments and questions for consideration and are open to working with Waimakariri District Council on ways to mitigate our concerns, in order for this project to be successful;

The safety and visibility of entering and exiting our property will be negatively affected by this plan.

Currently (especially with the NZTA beautification planting outside our property) visibility of traffic approaching our driveway from the right (Rangiora side) is already problematic and dangerous. Vehicles approaching our driveway are often travelling at speed (the current speed limit being 100kmph). Initial approaches to NZTA regarding these safety concerns were left unanswered, and we have adapted to the situation over time.
Vehicles typically accelerate heavily after exiting the rail crossing bend, often encroaching the road shoulder, meaning that we can not wait very close to that line in order to get the best visibility.

At this point, we have a restricted view of vehicles entering the rail crossing and use this to ascertain the best time to exit. This is not always reliable given that some drivers accelerate aggressively on exiting the bend.

We also feel that with the proposed re-routing of the road bending backwards (north) from our driveway, we will be unable to get a clear line of sight to judge oncoming traffic from the right (Rangiora side).

We feel that (regardless of any notified speed restrictions which may be placed on the south side of the proposed round about) vehicles having a "longer run up" will then be passing our driveway at greater

speeds (in both directions) than they are currently. This will make exiting our driveway significantly more dangerous. In addition, when we are towing either a trailer, or our caravan (8.5m in length), this would make exiting our driveway in either direction very unsafe.

Turning LEFT FROM our Driveway
Oftentimes, when exiting our driveway to turn left at the moment, we find that oncoming traffic is approaching faster than expected and have to pull into the narrow shoulder and onto grass verge (avoiding the Green NZTA sign) to wait for the traffic to pass before joining the road.

For traffic travelling towards Rangiora currently, as they pass our driveway "most" are already slowing down in preparation for entering the rail crossing, however with the proposed road, traffic will not be slowing down as the new roundabout is much further away and therefore the higher speed of the vehicles travelling north and south, coupled with the reduced visibility of traffic approaching from the north, will make exiting our driveway to turn right and head into Rangiora incredibly dangerous, especially if we are towing a trailer or caravan.

Turning RIGHT INTO our Driveway
Currently, if we are travelling north, from Kaiapoi and want to turn right to enter our driveway, we are able to see vehicles entering the north side of the railway crossing and judge if it is safe to turn right from the road. In many cases it is not, and rather than pull off to the left (as recommended in the NZ Road Code), as it is difficult due to the yellow sign warning road users of the rail crossing, we will usually continue into Southbrook and use the NPD forecourt to turn around and then approach our driveway again from the north to allow us to safely turn left into it. We are happy with the proposed roundabout offering us the opportunity to use that to complete the manoeuvre instead.

Turning RIGHT FROM our Driveway
However, given the current layout of Lineside Road south of our property, there is no option for us to do the same thing if we are not able to safely turn right from our driveway; there is no option for us to turn left and then safely turn right into either Fernside or Mulcocks road to turn around and then re-join Lineside road from there to travel north (esp. if towing a trailer). This may be included under the SH71 Lineside Safety Upgrade (noted under General comments) however as no detail on this is available, we can not clarify this.
To partially mitigate this, a merge lane could be installed opposite our driveway which may help by allowing us to turn right out of the driveway, enter the merge lane and then wait for a safe gap before joining the north bound traffic.

Turning left INTO our Driveway
Currently, when travelling south from Rangiora and making the turn into our driveway, we indicate that we are turning left as soon as we have passed the driveway for 580 Lineside Road and pull over to part of the shoulder (as long as there are no visible hazards in it from discarded rubbish) and complete the turn. Due to the speed of following traffic, we have had some "near misses" from people nearly "rear-ending" our vehicles as we slow down. If we are towing a trailer or caravan however, this is not possible and we must stay in the lane, whilst indicating and slowing down to be able to safely complete the turn, again this has resulted in several "near misses" from impatient drivers who are unable to pass us due to oncoming traffic.

To mitigate the safety risks of the increased speed of traffic approaching our driveway from the right, we note that there is a proposed MAX 60km sign included as vehicles exit the roundabout travelling south, followed by a MAX 80km sign a few metres before our driveway. However, in reality, many drivers will ignore these and be travelling much faster, **we are not clear what the actual (notified) speed limit of the road will be and would like some clarification on this and would suggest that any increase in speed limit should be on the south side of our driveway.**

Clarification required on the total width of the road
We note that the "blue area" noted on the map (P451A) provided by Robb Kerr, WDC at our initial meeting to discuss this (3-March-25) is significantly narrower as is passes outside our property than it is along the

rest of the proposed road. We have presumed that this “blue area” encompasses the grass verge (road reserve) however Rob was not able to confirm this during our telephone conversation on 14-March-25.
We also note that further along the proposed road, on the north side of the roundabout, dimensions for the road including both the blue areas and the active user path are 33.5m, however no similar dimensions are given for the road and the blue area outside of our property, other than showing that the blue area is significantly narrower.
Given that it is a State Highway at the point it passes our driveway, we are interested in understanding the recommended dimensions required under legislation. We have found a document from 2002 online (https://www.nzta.govt.nz/assets/resources/state-highwaygeometric-design-manual/docs/shgdm-part-6.pdf) but are unsure if this is the current version.

We would like clarification on what the total width of the road, plus shoulder, gravel, plus verge (road reserve) will be and that this will allow for us to safely enter and exit our driveway whether in a vehicle alone or one towing a trailer or caravan.

Removal of vegetation
To mitigate the visibility risks from the proposed design of the road, we presume from the map provided that the NZTA beatification planting will have to be removed as part of the proposed works (this is on the outside of our property in the current road reserve) which will be welcomed. We also expect that at least some of the shelterbelt on our property, along with some other trees within the council owned part of the property will need to be removed.

However, in doing this, we will then be left with our property being fully exposed to wind (esp. the strong Nor-West winds, remove the shelter from the elements for our stock, remove the noise barrier (noise from vehicles and the trains) along with having no privacy (security issue) for our property and have increased light pollution from vehicles travelling south from the roundabout. Currently the illuminated sign at Morrison’s Car Yard is visible from our outside area at night and the security lights from Carters shine brightly over the area where our shed is.

The vegetation and direction of traffic currently allow us privacy as only brief glimpses of the property are available to vehicles passing by, with the proposed route from the roundabout, full view of the house and sheds will be available for some time during the journey. All of which are significant concerns for us.

These could be mitigated by installing a fence of 6-8ft in height along the boundary of the property on the north and northeast side of the property. Installing any fence would provide a “blank canvas” for “taggers” which is not ideal either. This could be addressed by planting of suitable flaxes or other low maintenance, tall shrubs in front of the fence on the north side which would potentially reduce the risk of tagging long term. However, installing a fence on the west side of the property (where the driveway is) will not fix the issue of visibility and safety issues mentioned previously.

Rob also mentioned about an option maybe to install “earth bunds” (presumably on our property) but without some more discussion, we do not know if this would be a suitable option.

Another option to explore in regard to the safe entry and exit of our property, could be to relocate the driveway entrance to the corner where the driveway for 508 Lineside Road is. We have not explored this in any detail due to the time constraints on providing this feedback.

We do not know what the best solution is for mitigating any of the concerns we have, but are willing to openly discuss options with WDC and would like assurance from WDC that if the proposal B.1 get approval, we will be fully consulted with ample time provided for consideration.

The project will have a negative impact on our right to have “peaceful enjoyment of our property”

As mentioned previously, the relocation of the road to the area northeast of our property boundary will mean that we will have increased road noise, increased light pollution and decreased privacy and security.

Currently on the northeast boundary of our property, there is the driveway to the properties 580,582 etc, and the council storm water facility. Neither of these generate much in the way of noise or light pollution and albeit any vehicles travelling on the driveway have full view of our property, there are not significant numbers of these to cause concern.
As mentioned previously, the illuminated sign at Morrison's Car Yard is visible from our outside area at night and the security lights from Carters shine brightly over the area where our shed is. The proposed road is more in the line of sight with our back garden and therefore the lights from the traffic at night will shine straight through to our entertainment area. This will be more noticeable during the winter months when the deciduous trees drop their leaves.

We anticipate that this along with the noise of the traffic from that direction will also increase and have an impact on our use of our back garden. Currently, the house and garage buildings provide sound-proofing, however there is nothing similar on the north side of the house to offer the same or similar protection.

Privacy and security are also a serious concerns for us, vehicles travelling south from the roundabout will have a full view of our shed and equipment lending us to be more vulnerable to thieves. We have had several incidences over the last few years of unauthorised persons entering our property at various times of the day and night and due to this, we have installed security cameras.

These could be mitigated by installing a fence of 6-8ft in height along the boundary of the property on the north and northeast side of the property along with planting as suggested previously.

General comments and questions

Location of the Toby and Town Supply Water Feed
During the installation of the stormwater facility, something affected our well water supply and we were required to connect to the town supply system. The toby for this is located at the end of the driveway for 508 Lineside Road and the water pipe goes from that point, across our front paddock to the shed where the pump is located. We presume that the location of the pipe was documented by the WDC contractor who undertook this work and that this is attached to our property files as we were not given any documentation.

Moving the Stormwater Facility
The original installation of the stormwater facility meant that the flow of water through our creek has dropped, what impact will there be on the stream flowing through our property as and when this is re-located. We are aware that a contractor was sent some time last year to clear out the stream, will this be something that is repeated if the re-location is going to increase the flow?

Location of the Active Travel Route
The map currently shows the active travel route running alongside the proposed road on the north side of the roundabout, we do not understand why the road reserve verge will not separate active users from vehicle users on the new section of road on the north side of the proposed round about. Two laned roundabout
We note that the proposed roundabout shows that one lane of traffic spits into 2 to go around the roundabout and then remains 2 lanes on the other side, before merging into one lane again. Given the current merging issues found in Southbrook outside Kennards Hire going north and at the Southbrook/Southbelt/Boys Road junction, that consideration will be made on making one lane straight over and the other to turn down into Southbrook, otherwise, we suspect there will be issues.

Location of Power Lines and Poles
There are 2 power poles outside the property's northeast boundary, one in the line of the proposed road and the other on the boundary fence. The one in the line of the proposed road is either the start or end of the line. Has the removal, relocation of these been considered and will this have any impact on our property?

NZTA Lineside Road Safety Upgrade

We remember, some time ago that there was information published on this some years prior and was referred to in this STUFF article (26-June-21)
https://www.stuff.co.nz/national/125548132/north-canterbury-residents-fed-up-with-lack-ofaction-at-dangerous-intersection

"About $16.6 million had been earmarked, with work expected to be finished in 2023-24. The project, which would involve public consultation, would include installing a median barrier along the length of Lineside Rd and investigating ways to make the intersection safer.

The funding had been "endorsed" and was likely to be confirmed in August, she said."

At our meeting with Rob on 03-March-2025, we asked if this project would be aligning with the above mentioned project in order to future proof and provide consistency, however Rob advised that the above project was not in the current pipeline and may be 20 years before construction.

However the NZTA infographic https://www.nzta.govt.nz/assets/planning-andinvestment/nltp/2023/regional-summaries/canterbury-map-2023.pdf shows that SH71 Lineside Road improvements is labelled as "underway"?

We suggest, from a lay-person's perspective that "Option A" noted on the "REL Long List map" in red would appear on the face of it, to solve BOTH the issue with congestion in Southbrook AND the safety issues with Lineside Road.

iv. REL Transport Assessment of Options
Bound Separately Trim Ref 250319046069

v. REL – Draft Strategic and Economic Cases
Bound separately Trim Ref 250319046050

Transportation Assessment of Options

Rangiora Eastern Link

Prepared for:
Waimakariri District Council

7 March 2025

Prepared by:
Stantec New Zealand

Project/File:
310206347

Stantec New Zealand

Revision Schedule

Revision No.	Date	Description	Prepared by	Quality Reviewer	Independent Reviewer	Project Manager Final Approval
A	7 March 2025	Draft Report	Martin Peat	Chris Rossiter	Sam Rudge	Matt Soper

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Prepared by: _____
Signature

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Approved by: _____
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Table of Contents

List of Appendices

1 Introduction

The Rangiora Eastern Link (REL) is a significant infrastructure project for Waimakariri District Council (WDC), consulted on as part of the Long-Term Plan 2024-34. Stantec was engaged by Council to prepare an options assessment, economic evaluation and transportation analysis to quantify the impact of the project on the transport system. This assessment takes a step back to reassess alternatives and confirm the preferred option from a transport perspective and thereby inform the business case. Strategic options have been developed in collaboration with WDC staff.

1.1 Background

The Rangiora Eastern Link (as well as southern and western routes) were originally proposed in the Rangiora Transport Study (Beca, 2001) and a subsequent Scheme Assessment Report (Opus, 2005) developed alignment options for study and provided preliminary details for the selected alignment.

This early work identified a need to establish connections to the east, south and west which:

- Provide alternative routes into Rangiora
- Reduce congestion on the Rangiora north-to-south strategic route (Ashley Road to Southbrook Road corridor)
- Service the expected household growth to the east and west of the town and, industrial development to the south

> *"The Outline Development Plan includes provision for significant residential development to the east of Rangiora. This development is likely to put increasing pressure on the Percival Street, Southbrook Road route south. A link from Northbrook Road to Lineside Road is proposed to ease the pressure on the Percival Street, Southbrook Road route."*
>
> Scheme Assessment Report (Opus 2005)

With the continued growth in Rangiora and in support of the District Plan, Waimakariri District Council has been actively working on this project including the preparation of a Notice of Requirement (NOR) in 2021 for the new road designation. Developer contribution policy advice (WSP, 2022) included traffic modelling of the route designation. Recent work completed in 2024 included intersection modelling and design to determine the location and form of the southern intersection with Lineside Road and the relationship with railway crossing.

The current REL designation in Figure 1-1 is ~3 km new road between Lineside Road and Northbrook Road aligned west of the wastewater treatment plant.

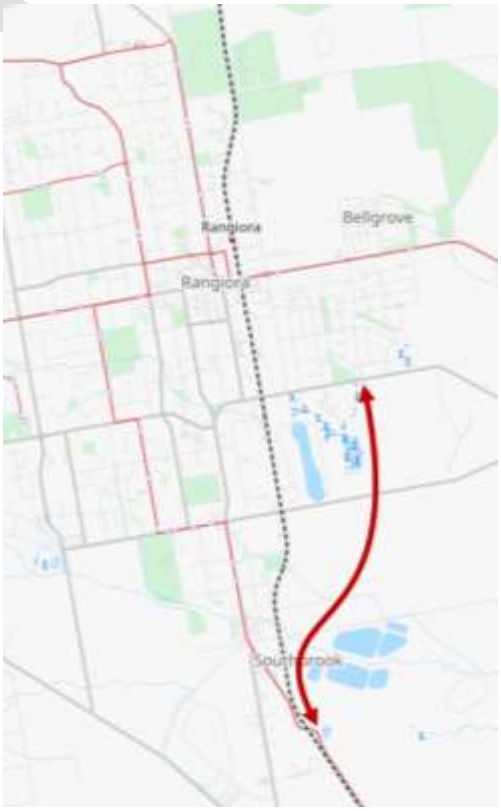


Figure 1-1 Existing REL designation

Figure 1-2 provides local area context of the key roads referenced in this report.

Figure 1-2 Rangiora map identifying key roads references in this report

1.2 Project Description

The proposed project connects Northbrook Road in the north and Lineside Road in the south via a new greenfields road. At the northern end, it connects with new roads through previous and current development areas, which continue across Kippenberger Ave to Coldstream Road at the northeastern edge of Rangiora. Road segments north of Northbrook Road will be built as residential development progresses, connecting the route through to Coldstream Road. At the southern end, a new roundabout is planned to link the new road to Southbrook Road (and the Southbrook Industrial area) to the west and Lineside Road (State Highway 71) to the south.

This new route is expected to reduce congestion through Southbrook, provide an alternative route to State Highway 1, and support the planned housing and business growth to the east of Rangiora.

1.3 Purpose of the Report

This transportation assessment of options for the Rangiora Eastern Link has been prepared to identify and evaluate options and assess their impact on the transport system. This report is provided to support the business case being prepared by Council.

2 Summary of Headline Results

The “headline results” from the analysis are presented within Table 2-1.

Table 2-1 Transport Assessment of Options – Headlines

Capacity/economic prosperity		
Impact on system reliability	Travel time reliability – motor vehicles	Travel time reliability benefits are expected with the reduction in congestion during the peak periods.
	Travel time delay	Delays encountered at key intersections along the Southbrook Road route are reduced by 1.5 to 3.5 min in 2038. Delays also decrease on the minor road (priority) approaches to Southbrook Road.
Impact on network productivity and utilisation	Access to key economic destinations (all modes)	By improving travel time reliability, reducing delays and increasing north-south capacity, the options make it faster and more efficient for goods and people from around Rangiora to reach SH1 and economic hubs in Christchurch City. However, freight from the Southbrook industrial area will face increased travel times to reach SH1 due to the increase in traffic using Lineside Road.
Access/reliability		
Impact on user experience of the transport system	Traffic – throughput	Short list options attract up to +3,000 additional vehicles per day to Lineside Road in 2028, increasing to around +4,500 vehicles per day in 2038. Southbrook Road has a forecast two-way volume of approximately 23,400 vehicles in 2028, increasing to 28,000 vehicles per day with four laning. The eastern link alignment will carry approximately 10,000 vehicles per day. SH71 Lineside Road has a two-way daily volume of approximately 17,000 vehicles which increases to around 20,000 vehicles per day.
	Travel time	Both options will improve travel times by around 1 to 1.5 minutes in the peak direction on Southbrook Road in 2028 and by 1.5 to 3.5 min in 2038. They also enable more traffic to reach Lineside Road meaning travel times increase in the order of 30 to 80 seconds, decreasing the net benefit. For access to eastern Rangiora, travel times to SH1 improve by up to 2.5 minutes with four laning and up to 3.5 minutes with the new road.
Resilience		
Impacts on system vulnerabilities and redundancies	Availability of a viable alternative to a high-risk and high-impact route	Four laning of Southbrook Road provides an extra lane in each direction in the event of an incident on this route. Route resilience is provided by REL as an additional route from the Ashley River to SH71 Lineside Road which detours around the town centre.
Safety		
Impact on social cost of deaths and serious injuries	Crashes by severity	REL will improve safety in two ways: (1) it will be designed as an arterial road, making travel safer; (2) it will attract traffic away from Southbrook Road, Rangiora-Woodend Road and other local roads, consequently providing a safety benefit on those roads.
	Deaths and serious injuries	

3 Growth and Development

Rangiora has a population of about 20,000 and is expected to grow to about 30,000 people by 2048. Future residential growth directions are proposed to the east (predominantly) and west of the current town.

Figure 3-1 Rangiora Residential Growth Areas[1]

Greenfield development yields in Rangiora have been sourced from WDC's summary of residential rezoning recommendations[2]. Most of these areas are depicted in the operative Waimakariri District Plan Outline Development Plan (ODP) accompanying Table 3-1. This table includes a breakdown of the planned development and staging agreed with WDC to calculate future year vehicle trip generation in the transport models.

Table 3-1 Eastern development areas and assumed staging as number of lots (by forecast year)

Development Area	2028	2038	2048
School farm	-	-	840
Sparks A	275	550	550
Sparks B	-	480	480
South East Rangiora	-	625	625
South East Rangiora (additional lots)	-	155	155
Belgrove (south)	-	720	720
Belgrove (main)	1040	1300	1300
Small holdings	-	133	265
Golf links	-	357	357
Greg Kelley	-	27	27
Belgrove (additional lots)	-	94	94
Total	**1,315**	**4,441**	**5,413**

[1] Rangiora Town Centre Strategy Blueprint 2030.pdf
[2] https://www.waimakariri.govt.nz/__data/assets/excel_doc/0035/166598/s42A-Residential-Rezonings-Summary-Table-FINAL.xlsx

4 Modelling Methodology

Transport modelling has been used to assess the impacts of the options. This section outlines the assumptions regarding road network and land use that are inherent in this modelling.

The basis of the traffic modelling is the Christchurch Assignment and Simulation Traffic (CAST) Model version 23a which sits under the higher-level Christchurch Transport Model (CTM). The CAST model includes Greater Christchurch and is designed for high-level analysis, such as the impacts of major infrastructure or land use changes over a large area.

The limitations of Saturn are its relative ability to estimate operational outcomes, such as at an intersection level, compared to more specialised microsimulation tools. Such tools are more applicable for use in design and operational planning compared to route identification. Therefore, Saturn represents the most appropriate existing tool to assess large-scale changes to the transport network.

A full validation and calibration of the CAST model was completed in 2021 (version 21a) which updated the 2018-year base model and provided a high-level check of the updated 2021-year model. Version 23a uses the same traffic demands as v21a and includes incremental network updates. Validation of the model included 6 screenlines of counts in the Waimakariri District.

Transport modelling for the previous transport assessment was completed in 2021 using CAST v18. The modelling used to inform development contributions in 2022 was derived from CAST v21a and provided a check of the validation criteria of CAST base model which concluded the overall validation appeared be sound and suitable for use. The performance of Lineside Road (SH71) was noted in WSP's reporting, suggesting the CAST model under-estimates traffic flows travelling south from Rangiora by around one quarter to one half, likely decreasing the probability of over estimating forecast trip making on the Eastern Link consideration.

Appendix A includes a check of the validation on Southbrook Road and routes to/from SH1.

4.1.1 Model Years and Time Periods

The CAST model covers three time periods as follows:

- AM peak period: 07:00 to 09:00 with a peak hour starting at 08:00
- Inter peak period: average hour between 09:00 and 16:00
- PM peak period: 16:00 to 18:00 with a peak hour starting at 16:30

The base year of the model remains as 2018 with a 2021 model most closely representing current conditions. Future year models for 2028, 2038 and 2048 are available for option testing and the results are reported upon.

Daily traffic volumes (AWT, average weekday totals) are reported herein which have been calculated using the standard CAST model method in Equation 4-1.

Equation 4-1 Calculation of Daily traffic volumes from the CAST model

$$Daily = (AM_{LV} \times 2 + IP_{LV} \times 7 \times 0.931 + IP_{LV} \times 2) \times 1.303 + (AM_{HCV} \times 2 + IP_{HCV} \times 7 \times 0.964 + IP_{HCV} \times 2) \times 1.185$$

where:

* Light vehicle (LV) and Heavy vehicle (HCV) flows are for the AM, IP, PM
* AM and PM are average hour volumes from the two hour peak

4.1.2 Development Trip Generation

Development in eastern Rangiora, outlined in Table 3-1, is represented in the model across 12 zones. Forecast trip generation is estimated using the following process:

- Determine model zone based on development area
- Estimate the number of residential lots in each zone using the s42A-Residential-Rezonings
- Calculate the trip rate for each zone using an estimated Medium Density Residential[3] daily trip rate of 7 trips per household and a peak hour rate of 0.8 trips
- Estimation the distribution of trips per day across time slices for each model period using CAST daily factors
- Calculate inbound / outbound proportions and origins/destinations based on similar adjacent 'donor' zones
- Assimilate development zone demands into the CAST model demand matrices.

The full development of the Eastern Development of some 5,400 households equates to additional 37,900 daily vehicle trips and 4,300 peak hour vehicle trips.

The models future years already includes additional population growth and therefore these calculations are in addition to this of that growth. Consequently, the growth in western Rangiora seen in Figure 3-1 has not also been added to the model as to not overestimate growth.

[3] NZ Transport Agency Research Report 453 – Trips and parking related to land use (2011)

5 Impact of Do Minimum

The Do Minimum is equivalent to Do Nothing for this project and forms a baseline for comparing options. It is comprised of committed projects (outlined below) and known development areas (as covered in the previous section).

5.1 Do Minimum Assumptions

The suite of CAST models contains an agreed set of projects and network changes represented in the model. A full list of the network assumptions is contained in **Appendix B**. On reviewing these with WDC, the following additional network assumptions were included in the Do Minimum models.

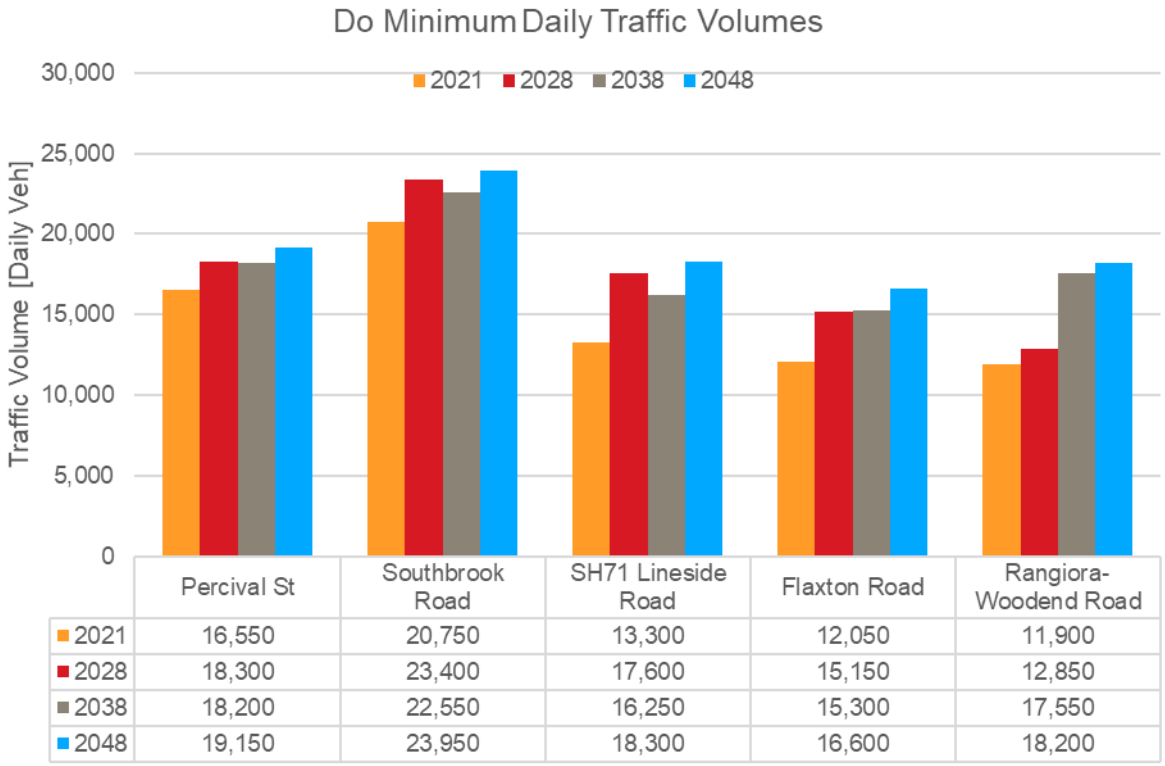
Table 5-1 Do Minimum network assumptions for future year models

Scheme / Project	Detail	2028	2038	2048
Fernside Road rail crossing	Left in/left out in all years	✓	✓	✓
Mulcocks Road rail crossing	Close in all years	✓	✓	✓
Blackett St - Keir St extension	Remove project in all years	✕	✕	✕
Woodend bypass	Bring forward to 2038	✕	✓	✓
NE Rangiora N-S Collector	MacPhail / Kippenberger to Coldstream	✕	✓	✓
Rangiora Eastern Link (this project)	Removed from CAST base models	✕	✕	✕
Eastern growth area	Local road network to support growth	✓	✓	✓
Western growth area	Local road network to support growth	✓	✓	✓

5.2 Analysis of Future Traffic Conditions

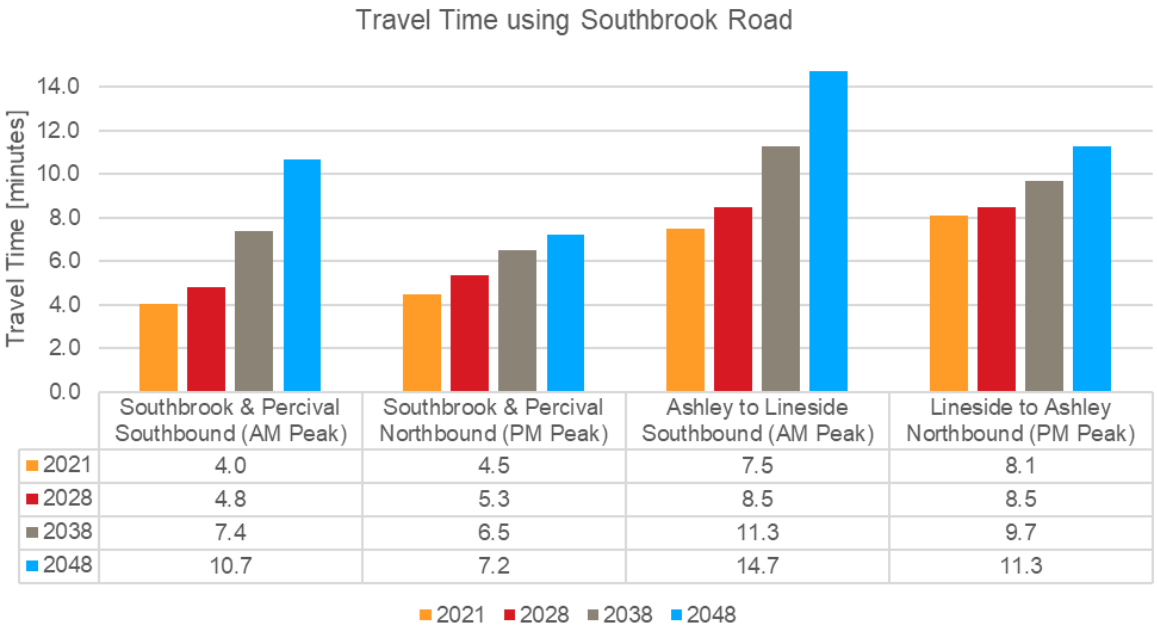
The Do Minimum models demonstrate that traffic volumes are set to increase and, as congestion increases, it will take longer to drive along Southbrook Road and travel across Rangiora.

Figure 5-1 shows that traffic volumes on Southbrook Road, Lineside Road and Flaxton Road plateau as Southbrook Road is at or near capacity. This is reinforced by the travel times presented in Figure 5-2. As development progresses in the eastern growth areas, this also leads to an increase in traffic on the Rangiora-Woodend Road.



	Percival St	Southbrook Road	SH71 Lineside Road	Flaxton Road	Rangiora-Woodend Road
2021	16,550	20,750	13,300	12,050	11,900
2028	18,300	23,400	17,600	15,150	12,850
2038	18,200	22,550	16,250	15,300	17,550
2048	19,150	23,950	18,300	16,600	18,200

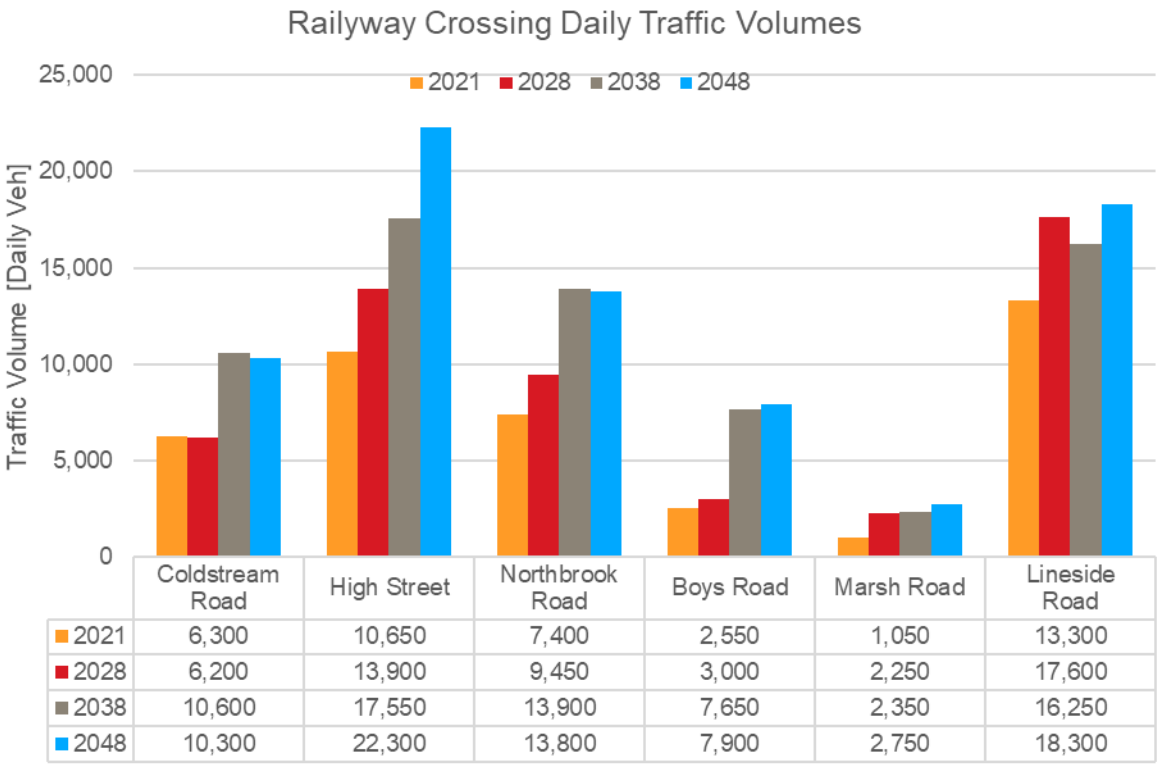
Figure 5-1 Forecast daily traffic volumes on select corridors (veh/day)



	Southbrook & Percival Southbound (AM Peak)	Southbrook & Percival Northbound (PM Peak)	Ashley to Lineside Southbound (AM Peak)	Lineside to Ashley Northbound (PM Peak)
2021	4.0	4.5	7.5	8.1
2028	4.8	5.3	8.5	8.5
2038	7.4	6.5	11.3	9.7
2048	10.7	7.2	14.7	11.3

Figure 5-2 Forecast travel times on Southbrook Road routes (in minutes)

Daily traffic volumes travelling east-west across the level crossings are also set to increase. The exception is the railway crossing on Lineside Road where the upstream effects of Southbrook Road somewhat limit the daily traffic increase past 2028. This is demonstrated in Figure 5-3.



	Coldstream Road	High Street	Northbrook Road	Boys Road	Marsh Road	Lineside Road
2021	6,300	10,650	7,400	2,550	1,050	13,300
2028	6,200	13,900	9,450	3,000	2,250	17,600
2038	10,600	17,550	13,900	7,650	2,350	16,250
2048	10,300	22,300	13,800	7,900	2,750	18,300

Figure 5-3 Forecast daily traffic volumes at railway crossings (veh/day)

5.2.1 Intersection Performance

The efficiency of the intersections along the north-south route from Ashley Street to Lineside Road were assessed using the CAST model to provide an indication of the Level of Service (LOS). The CAST model is a network-wide modelling tool and does not represent the same level of detail as a micro-simulation model. In general, as the amount of traffic increases, the level of service decreases if no improvements are made to the network.

Intersection LOS for the AM peak (Table 5-2) and PM peak (Table 5-3) show degrading levels of service through to 2048. A weighted average of delay is presented for signalised intersections and roundabouts, and the worst movement at priority intersections, to best demonstrate the changing traffic conditions between forecast years.

- Along Southbrook Road, the CAST model is known to show more delay than recent observations at the South Belt intersection and less delay at the Torlesse Street and supermarket intersections.
- Priority intersections along Percival Street and Southbrook Road, with minor approaches consistently at LOS E/F, show increasing levels of delay meaning it is more difficult to access the north-south corridor.
- The intersection of Ivory Street and Northbrook Road is the southernmost access to the eastern development areas without an eastern link in place. Here the LOS degraded with the uptake of residential development.
- Similarly, an increase in traffic volumes and a corresponding increase in delay at the Coldstream Road intersection coincides with the completion of the Kippenberger Ave to Coldstream Road connection and development through this area.

Table 5-2 Intersection LOS for AM Peak in the Do Minimum networks

Intersection LOS for AM Peak	2028 Do Minimum			2038 Do Minimum			2048 Do Minimum		
	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS
Ashley Street / Coldstream Road	857	**11**	B	1,058	**13**	B	1,304	**24**	C
Ashley Street / High Street	1,333	**25**	C	1,472	**27**	C	1,641	**30**	C
Ivory Street / Northbrook Road	1,309	**23**	C	1,566	**91**	F	1,601	**141**	F
Percival Street / Victoria Street	1,535	**38**	E	1,609	**50**	E	1,632	**62**	F
Percival Street / Johns Road	1,657	**42**	E	1,784	**57**	F	1,807	**73**	F
Percival Street / Charles Street	1,505	**36**	E	1,831	**127**	F	1,871	**179**	F
Southbrook Road / South Belt / Percival Street / Boys Road	2,045	**46**	D	2,066	**56**	E	1,953	**24**	C
Southbrook Road / Torlesse Street	1,873	**7**	A	1,944	**31**	C	1,912	**27**	C
Southbrook Road / Pak 'n Save supermarket	1,972	**7**	A	1,952	**7**	A	1,914	**7**	A
Lineside Road / Todds Road	1,866	**79**	F	1,828	**113**	F	1,810	**243**	F
Lineside Road / Flaxton Road	1,866	**38**	E	1,805	**36**	E	1,777	**39**	E
Kippenberger Ave / MacPhail Ave	781	**11**	B	1,156	**12**	B	1,422	**13**	B
Northbrook Road / MacPhail Ave	287	**6**	A	954	**12**	B	1,030	**12**	B

Table 5-3 Intersection LOS for PM Peak Do Minimum networks (average intersection delay)

Intersection LOS for PM Peak	2028 Do Minimum			2038 Do Minimum			2048 Do Minimum		
	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS
Ashley Street / Coldstream Road	1,115	**17**	C	1,422	**45**	E	1,952	**195**	F
Ashley Street / High Street	1,707	**29**	C	2,075	**36**	D	2,345	**51**	D
Ivory Street / Northbrook Road	1,672	**40**	E	1,955	**98**	F	2,020	**130**	F
Percival Street / Victoria Street	1,787	**73**	F	1,927	**107**	F	1,950	**127**	F
Percival Street / Johns Road	1,908	**64**	F	2,053	**83**	F	2,018	**97**	F
Percival Street / Charles Street	1,850	**74**	F	1,987	**139**	F	2,063	**156**	F
Southbrook Road / South Belt / Percival Street / Boys Road	2,312	**45**	D	2,753	**61**	E	2,978	**66**	E
Southbrook Road / Torlesse Street	2,100	**11**	B	2,306	**14**	B	2,520	**18**	B
Southbrook Road / Pak 'n Save supermarket	2,280	**24**	C	2,361	**32**	C	2,437	**39**	D
Lineside Road / Todds Road	2,146	**127**	F	2,174	**148**	F	2,230	**163**	F
Lineside Road / Flaxton Road	2,107	**74**	F	2,125	**95**	F	2,173	**110**	F
Kippenberger Ave / MacPhail Ave	1,048	**11**	B	1,712	**13**	B	1,824	**14**	B
Northbrook Road / MacPhail Ave	356	**6**	A	996	**11**	B	1,022	**12**	B

6 Options and Alternatives

Optioneering has considered the alternatives for achieving the project objectives. Through the business case to support the REL project, WDC identified investment objectives that focus on:

- Unlocking land for housing
- Reducing travel times
- Improving safety

A range of options and alternatives was developed in collaboration with WDC covering a suite of intervention types. This included optioneering how to make best use of the existing infrastructure through changes to lane configuration or technology, and a review of alternative alignments for REL. The alignment west of the wastewater treatment plants was proposed in 2005 and so this was a chance to explore the connection to Lineside Road and options further east with a fresh lens. These infrastructure options are shown in the Figure 6-1 map, where alternate alignments aim to:

- Increasing the separation between REL and the railway
- Unlock additional rural land east of the treatment ponds
- Create an eastern boundary road

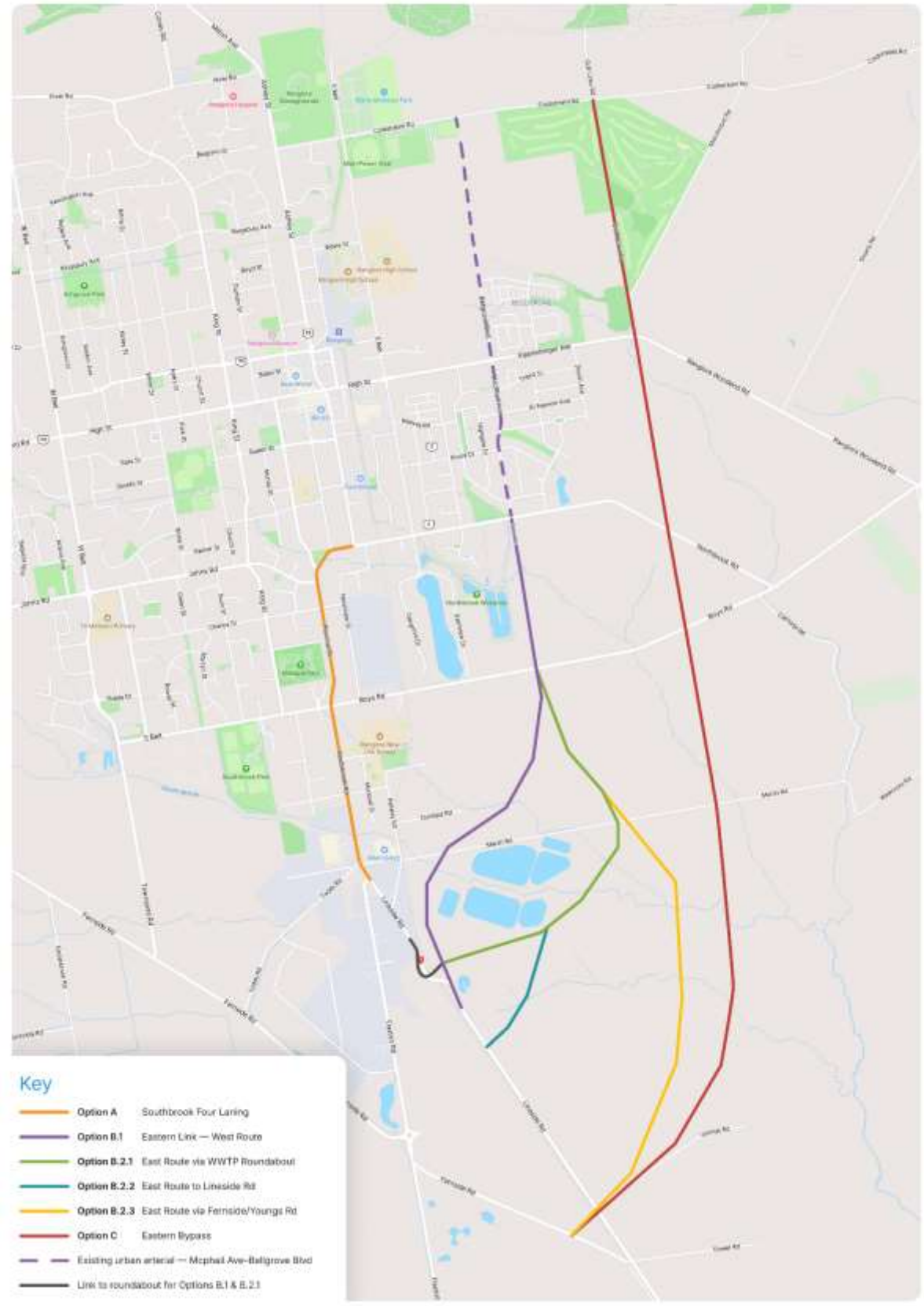


Figure 6-1 Infrastructure long list options for Rangiora Eastern Link where the Option B.1 follows the existing route designation

The Early Assessment Sifting Tool was used for an initial coarse screening to quickly and robustly filter alternatives and options (Table 6-1). **Appendix C** contains this assessment. Eight (8) options were progressed to the subsequent multi-criteria analysis, focusing on criteria that correspond to the key project risks.

Table 6-1 Initial screening of options and alternatives

Intervention Type	Alternative / Option	Early Assessment
Integrated planning	Aligning development pattern with existing network	Discontinue
Manage demand	Time of Use Charging	Progress
	Congestion Charging	Discontinue
Best use of the existing system	Tidal laning (2+1)	Progress
	Four lane Southbrook Road within existing road reserve	Progress
	Increase PT frequency	Discontinue
	Upgrade western route	Discontinue
New infrastructure	Construct REL to Northbrook (West of WWTP) *this is the existing route designation*	Progress
	Construct REL to Northbrook (East of WWTP)	Progress
	Construct REL Lineside (further south) to Northbrook	Progress
	Park and Ride upgrade	Discontinue
	Rapid transit	Discontinue
	New western bypass	Discontinue
	New eastern bypass - Fernside to Coldstream Road	Progress
	Widen and four lane Southbrook Road	Progress

6.1 Long List MCA against key risks

The MCA criteria are provided within Table 6-2. These are a consolidated set of the standard NZ Transport Agency criteria and focus on the differentiation of options. A -3 to +3 scoring scale was adopted where a score of zero has generally been taken as being ‘as per the status quo’, but with consideration that the network is experiencing rapid growth and other network changes are currently progressing. The scoring for specific criteria was owned by the project team and scores were presented back to the WDC project steering group where the short list was agreed.

Table 6-2 MCA Criteria

Theme	Criteria
Investment Objectives	Unlocks land for housing
	Reduces travel times
	Improves safety
Critical success factors	Affordability
	Risk to delivery
	Value for money
	Resilience
Opportunities and Impacts	Environment and Cultural
	Social and Landscape
	People & Property

A breakdown of the individual scores for each option is provided in Table 6-3. From the long list MCA included in Appendix C, four (4) options were progressed to the short list for traffic modelling and economic analysis:

- A.1 – Four laning of Southbrook corridor within the existing road reserve
- B.1 – Eastern Link – alignment west of WWTP
- B.2.1 – Eastern Link – alignment east of WWTP
- B.2.2 – Eastern Link – alignment east of WWTP to Lineside Road

Option A.1 is progressed as the most likely Southbrook Road option, together with variants of Option B.

Table 6-3 Long List MCA – Scoring Overview

		Investment			Critical success factors				Opportunities		
		Unlocks land for housing	Reduces travel times	Improves safety	Affordability	Risk to delivery	Value for money	Resilience	Environment and Cultural	Social and Landscape	People & Property
Southbrook Road											
A.1	Southbrook four laning – existing road reserve	0	1	-3	-1	-2	1	1	0	-2	-3
A.2	Southbrook four laning – within wider road reserve	0	1	-1	-2	-3	1	1	0	-2	-3
A.3	Southbrook three laning – tidal flow 2+1	0	1	-3	-1	-3	1	1	0	-2	-2
Managing Demand											
A.4	Congestion charging / Time of Use	0	1	-1	-2	-3	-3	0	0	-3	-1
Eastern Alignments											
B.1	Eastern Link – west route	3	3	3	-2	3	3	3	-2	0	-1
B.2.1	Eastern Link – east route to WWTP roundabout	3	3	3	-2	2	3	3	-2	0	-1
B.2.2	Eastern Link – east route to Lineside Rd	3	3	1	-2	-1	2	3	-2	0	-2
C	Eastern Bypass	2	2	2	-2	-3	-1	3	-3	-3	-3

Commentary associated with the scoring of the long list included:

- Southbrook Road options provide additional capacity that will assist travel time improvements but are also likely to induce traffic into the corridor
- Additional traffic volumes on Southbrook Road, and more traffic lanes will increase severance across the route. This is compounded by the removal of parking and cycle facilities.
- Southbrook road options are likely to induce more traffic on railway crossings
- The lower cost options are on Southbrook Road, but they are also likely to have a lower range of benefits.
- In general, options outside the existing designation present a risk to delivery. Southbrook Road options will require comprehensive community and stakeholder engagement
- Eastern alignment options bisect the future development area, supporting growth, and provide a more resilient network as an additional north-south route.
- Eastern alignments provide an alternate route to Southbrook Road and are expected to reduce traffic volumes and travel times through Southbrook.

- Option B variants include an upgrade of the Lineside Road railway crossing, benefitting safety and active modes.
- Eastern alignments connecting further south on Lineside Road are untested for technical feasibility and community engagement.
- The Eastern Bypass (Option C) is furthest from existing residential areas and at the outer limits of future urban growth. This diverts traffic further from local social and employment destinations and may degrade community connections.
- Alignments east of WWTP overlap with silent file area SF011 at Tuahiwi.
- Adding an additional lane to Southbrook Road is likely to compromise the cross section, including removal of parking and cycle lanes.

The eastern alignments of Option B variants score highest in the MCA and test the core differences to the existing route designation so on this basis are taken forward in preference to Option C. Four laning of Southbrook Road (Option A.1) considered to have the least risk to delivery of the remaining long list and is taken forward (along with the Do Minimum) as an alternative to constructing a new route.

7 Short List Options

The four options carried forward to the short list are described in Table 7-1.

Table 7-1 Short List Options

Option	Name	Outline details
A.1	Southbrook Four laning – within existing road reserve	• Widening from 12-13m sealed carriageway to 14.4m. • No parking or cycleways. • Rebuild kerbs and widened pavement. • Additional traffic signals at intersections with Northbrook Road, Todds Road and Flaxton Road • Railway Road cycleway route plus allowance for King St to High Street cycleway on road
B.1	Eastern Link - west route	• Designation route. • Shared use path, and rural to urban arterial • Dual lane roundabout at Lineside Road with rail crossing.
B.2.1	Eastern Link – east route to WWTP roundabout	• Route to east of WWTP • Shared use path, arterial and rural to urban arterial • Dual lane roundabout at Lineside Road with rail crossing.
B.2.2	Eastern Link – east route to Lineside Road	• Variation to Option B.2.1 • With a connection to a new roundabout on Lineside Road c400m from rail crossing • Retaining existing Lineside Road rail crossing.

An additional Option B.1a is included as a variation of Option B.1 but with the Marsh Road level crossing closed.

7.1 Provision for Active Modes

The project will provide a north-south route for cycling, connecting to the Passchendaele cycleway in the south.

- Option A.1 provides a cycleway route on Railway Road, parallel to Southbrook Road
- Option B variants provide a shared use path on the western side of the new road and connect to the Passchendaele cycleway with a new pedestrian level crossing (and road crossing) at Lineside Road

7.2 Model Assumptions

Four alignment options are modelled for 2028, 2038 and 2048.

Option	Name	2028	2038	2048
DN	Do Minimum	✓	✓	✓
A	Southbrook Road four laning	✓	✓	✓
B.1	Eastern Link - west route	✓	✓	✓
B.2.1	Eastern Link – east route to WWTP roundabout	✓	✓	✓
B.2.2	Eastern Link – east route to Lineside Road	✓	✓	✓

All options (but not Do Minimum) include the Spark Lane connection to Northbrook Road. Posted speed limits modelled are:

- REL north of Northbrook Road: 50kph
- REL between Lineside Road and Northbrook Road: 60kph

8 Short List Analysis

The short list options are modelled in future years 2028 (circa opening year), 2038 (+10 years) and 2048. The assessment of options focusses on 2038, with analysis of 2028 and 2048 provided for context. Note that Option B2.1 and Option B2.2 modelling results are under review and will be included in the next revision of this report.

This section assesses the transport effects of the options against the Do Minimum network. It focusses on the key outputs from the traffic modelling with extended analysis in **Appendix D**.

8.1 Transport Effects – Traffic Volumes

The REL project will provide a capacity improvement, either in the form of four-laning, or a new arterial road. Capacity improvements by nature will attract additional traffic to the corridor. Table 8-1 and Table 8-2 provide the forecast daily traffic volumes for various sections of Southbrook Road, the REL alignment and other local roads for the 2028, 2038 and 2048 years.

Table 8-1 Forecast daily traffic volumes on key roads for future years in all options

		Do Min	Opt A	Opt B.1a	Opt B.1	Opt B.2.1	Opt B.2.2
2028							
Ivory Street	north of Northbrook Road	12,100	16,450	11,550	11,450		
Percival St	north of South Belt	18,300	23,400	15,900	15,850		
Southbrook Road	north of Station Road	23,400	28,050	20,400	20,300		
Southbrook Road	at level crossing	17,600	20,550	15,250	12,700		
SH71 Lineside Road	south of REL roundabout	17,600	20,550	19,250	18,800		
Rangiora-Woodend Road	east of Golf Links Road	12,850	10,600	11,900	12,300		
Fernside Road	south of Townsend Road	11,700	10,450	11,000	10,750		
2038							
Ivory Street	north of Northbrook Road	13,450	18,150	12,800	12,650		
Percival St	north of South Belt	18,200	24,800	15,500	15,300		
Southbrook Road	north of Station Road	22,550	28,900	19,800	19,400		
Southbrook Road	at level crossing	16,250	20,800	14,700	11,250		
SH71 Lineside Road	south of REL roundabout	16,250	20,800	20,700	18,550		
Rangiora-Woodend Road	east of Golf Links Road	17,550	14,600	16,150	18,050		
Fernside Road	south of Townsend Road	12,450	11,500	11,750	10,900		
2048							
Ivory Street	north of Northbrook Road	16,150	18,900	14,050	14,050		
Percival St	north of South Belt	19,150	25,800	16,200	16,300		
Southbrook Road	north of Station Road	23,950	30,300	20,450	20,300		
Southbrook Road	at level crossing	18,300	21,600	15,200	12,700		
SH71 Lineside Road	south of REL roundabout	18,300	21,600	21,550	21,300		
Rangiora-Woodend Road	east of Golf Links Road	18,200	16,450	18,050	18,050		
Fernside Road	south of Townsend Road	14,200	12,300	12,850	13,000		

The traffic modelling shows:

- Option A induces additional traffic to the Ivory Street – Percival Street – Southbrook Road corridor in all forecast years. Variations of Option B reduce traffic in the corridor.
- Overall - the unlocking of the capacity constraints on Southbrook Road by providing additional north-south capacity allows more traffic to access SH71 Lineside Road.
- Option A, followed by Option B.1a, have the largest reduction in traffic volumes on Rangiora-Woodend Road and Fernside Road (two parallel routes towards SH1)
- Option A has the most traffic using the Lineside Road level crossing (more than the Do Minimum in all forecast years). Option B reduces these volumes relative to the Do Minimum.

Table 8-2 Forecast daily traffic volumes on Eastern Link route for future years in all options

		Do Min	Opt A	Opt B.1a	Opt B.1	Opt B.2.1	Opt B.2.2
2028							
Eastern Link	south of Coldstream Road	-	-	-	-	-	-
Eastern Link	south of Kippenberger Ave	1,700	1,550	3,000	3,000		
Eastern Link	south of Northbrook Road	-	-	6,550	6,550		
Eastern Link	south of Boys Road	-	-	5,750	6,550		
Eastern Link	south of Marsh Road	-	-	6,250	6,100		
2038							
Eastern Link	south of Coldstream Road	1,600	1,550	2,450	2,150		
Eastern Link	south of Kippenberger Ave	3,150	2,850	5,150	4,550		
Eastern Link	south of Northbrook Road	-	-	12,250	11,700		
Eastern Link	south of Boys Road	-	-	9,150	9,500		
Eastern Link	south of Marsh Road	-	-	9,400	7,350		
2048							
Eastern Link	south of Coldstream Road	1,850	1,750	2,500	2,450		
Eastern Link	south of Kippenberger Ave	3,950	3,700	5,950	6,200		
Eastern Link	south of Northbrook Road	-	-	12,600	12,900		
Eastern Link	south of Boys Road	-	-	9,750	11,550		
Eastern Link	south of Marsh Road	-	-	10,200	8,700		

Specifically related to traffic volumes in Table 8-2:

- Traffic volumes between Coldstream Road and Northbrook Road (along MacPhail Ave and the new connector road) increase in all Option B variants

8.1.1 Flow Difference Plots

Flow difference plots show the difference between Option A (Figure 8-1) and Option B1a (Figure 8-2) when each are compared against the Do Minimum.

Figure 8-1 demonstrates that Option A draws additional traffic into the Southbrook Road corridor, some of which was using alternate routes such as:

- To the west destined for the Ashley River via Eastebrook Road and Lehmans Road
- A diversion around Southbrook Road encompassing Fernside Road, Townsend Road and South Belt
- Rangiora-Woodend Road to access the east of Rangiora

Figure 8-1 Flow difference plot comparing Option A with Do Minimum (2038 PM peak)

In general, Figure 8-2 shows that Option B1a has similar wider network changes in traffic patterns, such as decreases in traffic on Fernside Road, Townsend Road and South Belt; and an increase on Flaxton Road and Lineside Road.

The reduction in traffic shown on Southbrook Road in Option B1a is replaced by traffic on the new route (which is not shown as a difference in this image). The model also shows likely rat-running through residential streets such as East Belt and Koura Drive to access REL.

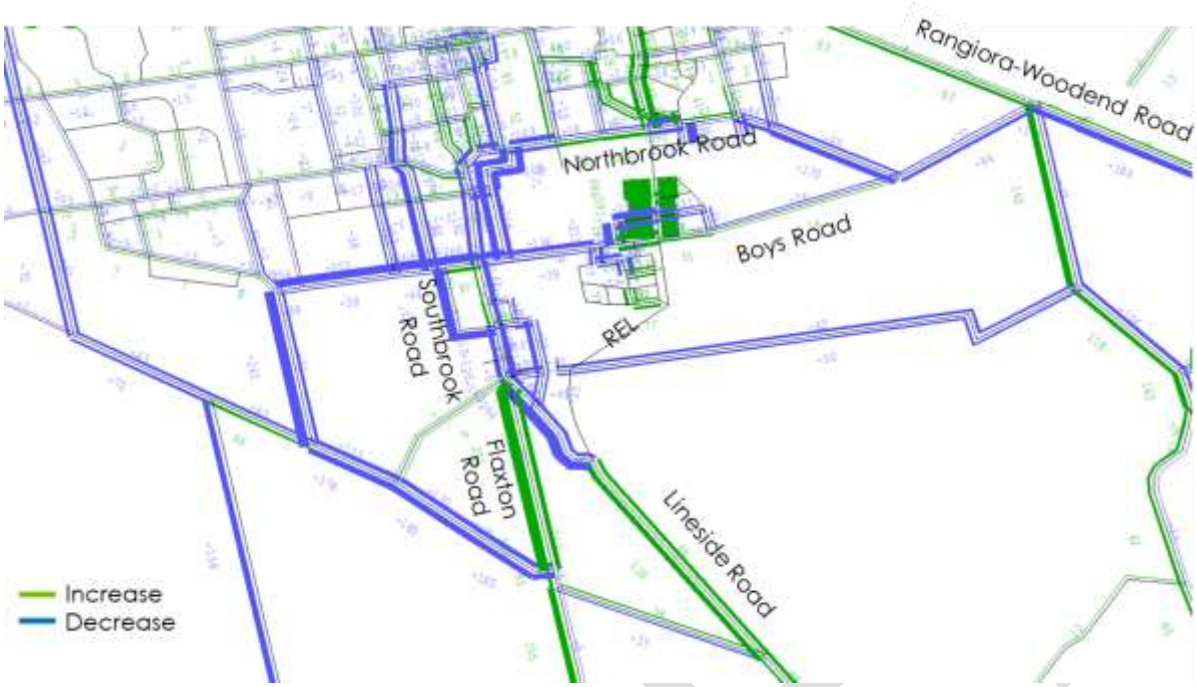


Figure 8-2 Flow difference plot comparing Option B.1a with Do Minimum (2038 PM peak)

8.1.2 Route Analysis Through Rangiora

The following model outputs (taken from the 2038 PM peak) demonstrate how the network is being used by way of 'select link' plots which capture vehicles traversing through points on the network. These show who uses:

- Lineside Road south of REL roundabout (Figure 8-3 and Figure 8-4)
  - » Of the traffic on Lineside Road, more traffic uses Southbrook Road than REL and Southbrook Road remains the dominant route to the centre of Rangiora.

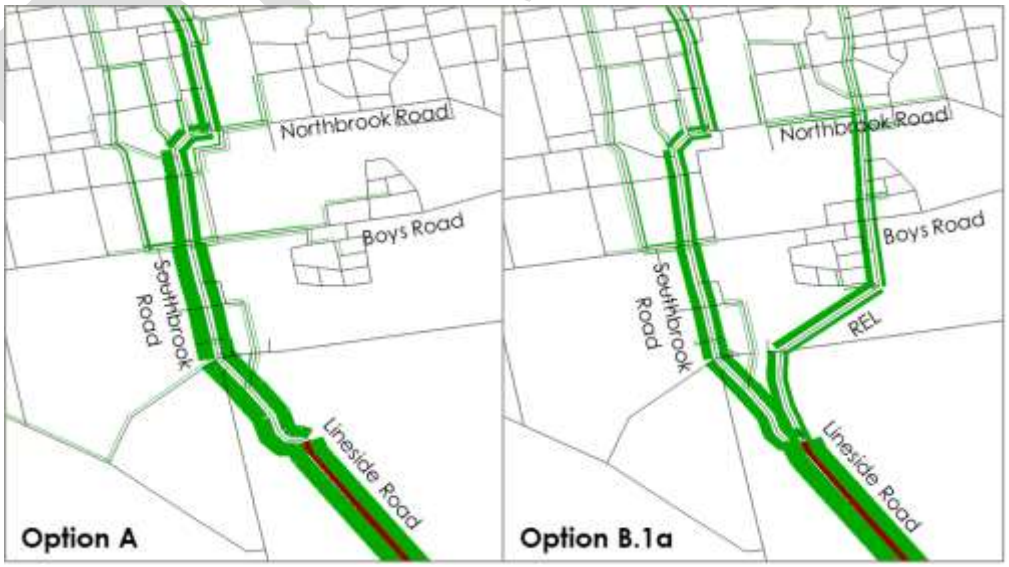


Figure 8-3 'Select Link' showing users of Lineside Road south of REL (from 2038 PM models)

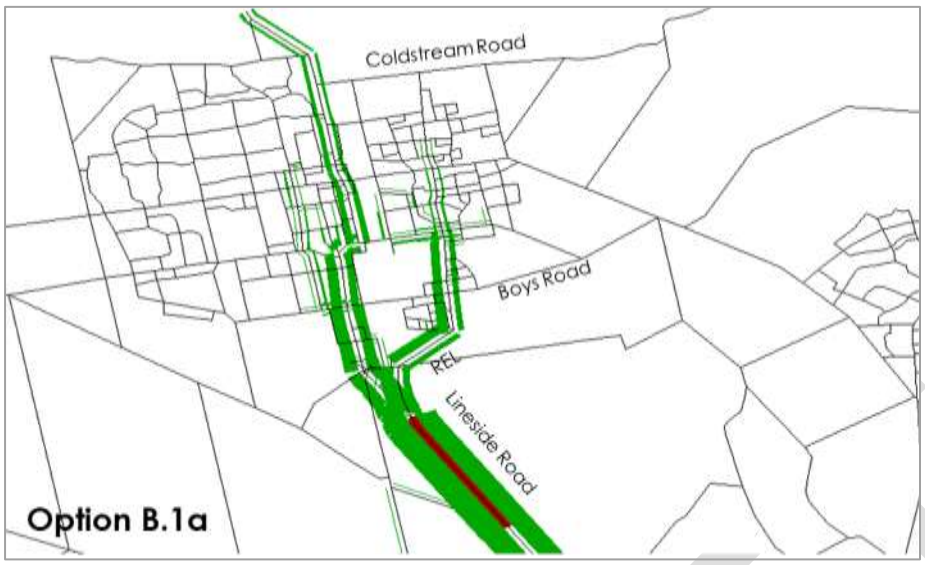


Figure 8-4 A wider 'Select Link' showing users of Lineside Road south of REL (from 2038 PM models)

- REL alignment between Marsh Road and Boys Road (Figure 8-5)
  - » Most traffic on the middle segment of REL is accessing the residential areas and using Lineside Road
  - » Right turn delays further north at Coldstream Road / Ashley Road may be contributing to less traffic using REL as a bypass of the town centre.

Figure 8-5 'Select Link' showing users of REL between Marsh Road and Boys Road (from 2038 PM Option B.1a)

8.1.3 Effect on Railway Crossings

Daily traffic volumes forecast for each option in 2028, 2038 and 2048 are set out in Table 8-3. The key takeaways from this are:

- Once the Coldstream Road to Kippenberger Ave connection is completed (post 2028), there is a notable increase in traffic using Coldstream Road in 2038 and 2048.
- Option A reduces the traffic volumes on Coldstream Road compared to the Do Minimum.
- Option A increases traffic volumes on the High Street crossing in 2028 and 2038. There is minimal change on the High Street crossing for Option B variants in 2028 and 2038 and a decrease in usage in 2048.
- Traffic volumes across the Marsh Road, Boys Road and Lineside Road level crossings are somewhat balanced in the Option B variants. Hence the closure of the Marsh Road crossing means more traffic uses Boys Road and Lineside Road level crossings in Option B.1a
- Less traffic uses the level crossing on Fernside Road in all options compared to the Do Minimum.
- Option A has the most traffic using the Lineside Road level crossing (more than the Do Minimum in all forecast years). Option B reduces these volumes relative to the Do Minimum.

These trends are presented visually in Figure 8-6.

Table 8-3 Forecast daily traffic volumes on railway crossings (2-way)

2028	Do Min	Opt A	Opt B.1a	Opt B.1	Opt B.2.1	Opt B.2.2
Coldstream Road	6,200	4,400	6,150	6,500		
High Street	13,900	15,350	13,350	13,300		
Northbrook Road	9,450	7,150	7,250	7,050		
Boys Road	3,000	3,400	2,900	1,400		
Marsh Road	2,250	2,100	0	4,400		
Lineside Road	17,600	20,550	15,250	12,700		
Fernside Road	1,400	1,000	1,200	1,100		
2038						
Coldstream Road	10,600	7,250	10,000	11,400		
High Street	17,550	19,450	17,150	17,000		
Northbrook Road	13,900	11,600	10,700	10,950		
Boys Road	7,650	8,200	6,050	3,650		
Marsh Road	2,350	2,250	0	6,000		
Lineside Road	16,250	20,800	14,700	11,250		
Fernside Road	1,600	1,100	1,200	1,150		
2048						
Coldstream Road	10,300	8,700	11,100	11,150		
High Street	22,300	22,300	20,600	20,650		
Northbrook Road	13,800	12,950	11,350	11,350		
Boys Road	7,900	8,250	6,700	4,300		
Marsh Road	2,750	2,600	0	6,650		
Lineside Road	18,300	21,600	15,200	12,700		
Fernside Road	1,350	1,150	1,300	1,100		

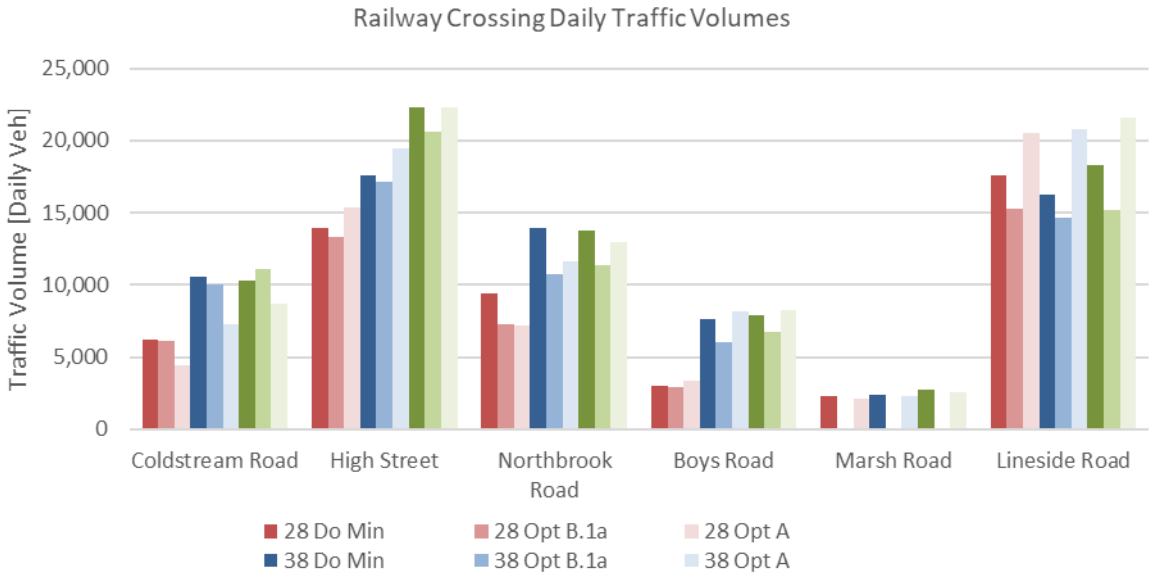


Figure 8-6 Forecast daily traffic volumes on railway crossings (2-way) for select options

8.1.3.2 Marsh Road Level Crossing

Marsh Road is an unsealed rural road with an ADT of around 200 vehicles and provides access to the wastewater treatment plant. An early question to answer with the traffic modelling is the status of the Marsh Road level crossing immediately west of the REL designation.

Traffic model volumes demonstrate that a route alignment near the level crossing incentivises local trips to/from Southbrook to use the level crossing and this would necessitate upgrading the level crossing and Station Road intersection. This is demonstrated in Figure 8-7 which shows that, when closed, traffic to/from the northern segments of REL would either use Boys Road or the Lineside Road crossing.

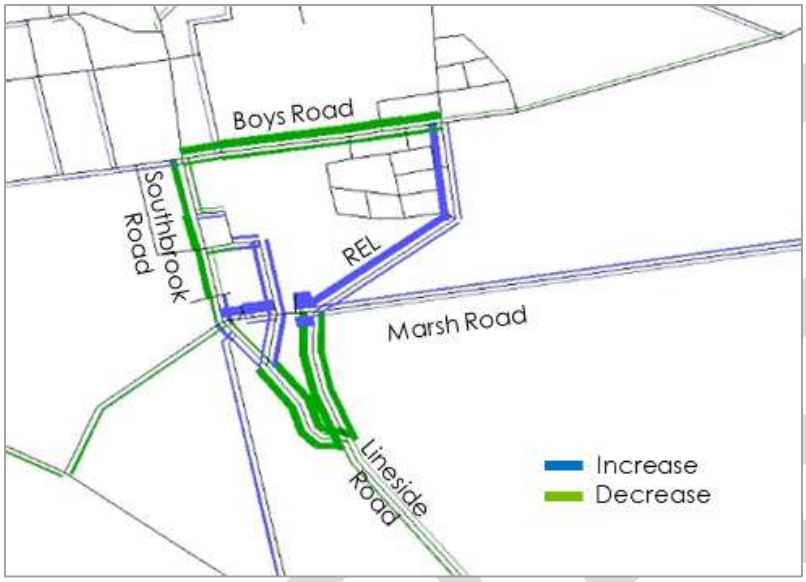


Figure 8-7 Change in traffic pattern when Marsh Road level crossing is closed

As a result of the induced traffic at the crossing, and the resulting mitigation required, WDC prefer to close the level crossing. This is captured in the reporting of Option B.1a.

8.2 Transport Effects – Travel Times

A core set of travel time routes are reported to capture the effects on:

- Southbrook Road (and Percival Street) from Northbrook Road to Lineside Road
- Lineside Road from the railway crossing to SH1 interchange
- Rangiora-Woodend Road from the town centre (Ivory Street) to SH1

Table 8-4 provides a summary of the travel times for these routes, for each option and each forecast year. This demonstrates negligible differences in travel times between the variants of Option B.

Table 8-4 Travel times comparison on key routes (in minutes)

Route	AM Peak					PM Peak				
2028	DM	OptA	OptB1a	OptB21	OptB22	DM	OptA	OptB1a	OptB21	OptB22
Northbrook to Lineside SBD	4.8	3.5	4.0			4.3	3.3	4.0		
Lineside to Northbrook NBD	4.1	3.2	3.7			5.3	3.7	4.6		
Lineside Road SBD	6.2	6.5	6.6			5.7	6.0	6.0		
Lineside Road NBD	5.2	5.4	5.5			7.3	8.6	8.0		
Rangiora-Woodend EBD	8.3	8.3	8.3			8.4	8.5	8.5		
Rangiora-Woodend WBD	8.6	8.6	8.6			8.9	8.8	8.8		
2038										
Northbrook to Lineside SBD	7.4	3.8	4.0			4.3	3.3	3.9		
Lineside to Northbrook NBD	4.2	3.4	3.7			6.5	4.7	5.0		
Lineside Road SBD	6.8	7.6	8.6			5.7	5.9	6.1		
Lineside Road NBD	5.2	5.4	5.5			7.8	8.4	9.0		
Rangiora-Woodend EBD	11.6	9.4	8.8			8.8	8.9	8.8		
Rangiora-Woodend WBD	9.0	8.9	8.8			10.2	9.7	9.7		
2048										
Northbrook to Lineside SBD	10.7	4.3	4.2			4.5	3.4	3.9		
Lineside to Northbrook NBD	4.4	3.4	3.9			7.2	5.9	5.5		
Lineside Road SBD	6.9	9.0	11.0			5.9	6.1	6.5		
Lineside Road NBD	5.2	5.5	5.6			9.2	10.0	10.8		
Rangiora-Woodend EBD	14.9	12.0	10.9			9.1	9.1	9.1		
Rangiora-Woodend WBD	9.4	9.4	9.1			12.5	11.9	11.5		

The travel times for the Do Minimum, Option A and Option B1a are presented visually in Figure 8-8 and Figure 8-9, showing:

- Increasing travel times in the peak direction on Southbrook Road and Rangiora-Woodend Road if nothing is done
- Both Option A and Option B variants reduce congestion on Southbrook Road
- Increasing travel times on Lineside Road and Rangiora-Woodend Road in the peak direction in the Do Minimum scenario for all years.
- Travel times increase on Lineside Road in both Option A and Option B variants due to the increase in traffic induced by the provision of additional capacity north-south through Rangiora.
- These disbenefits on Lineside Road could be offset by benefits that are gained by travel time improvements on Southbrook Road.

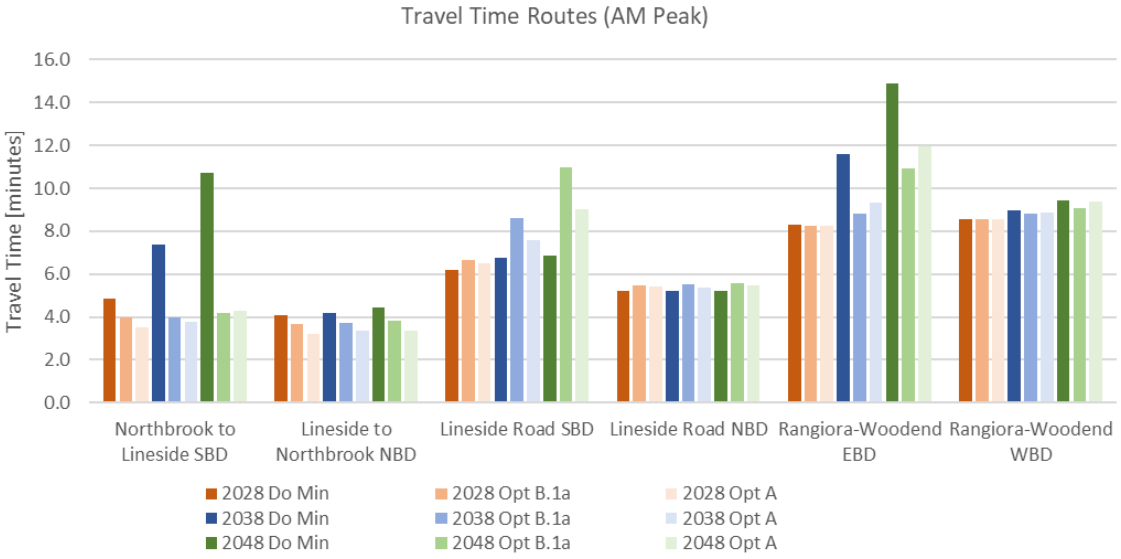


Figure 8-8 Travel times on key routes for select options – AM Peak (in minutes)

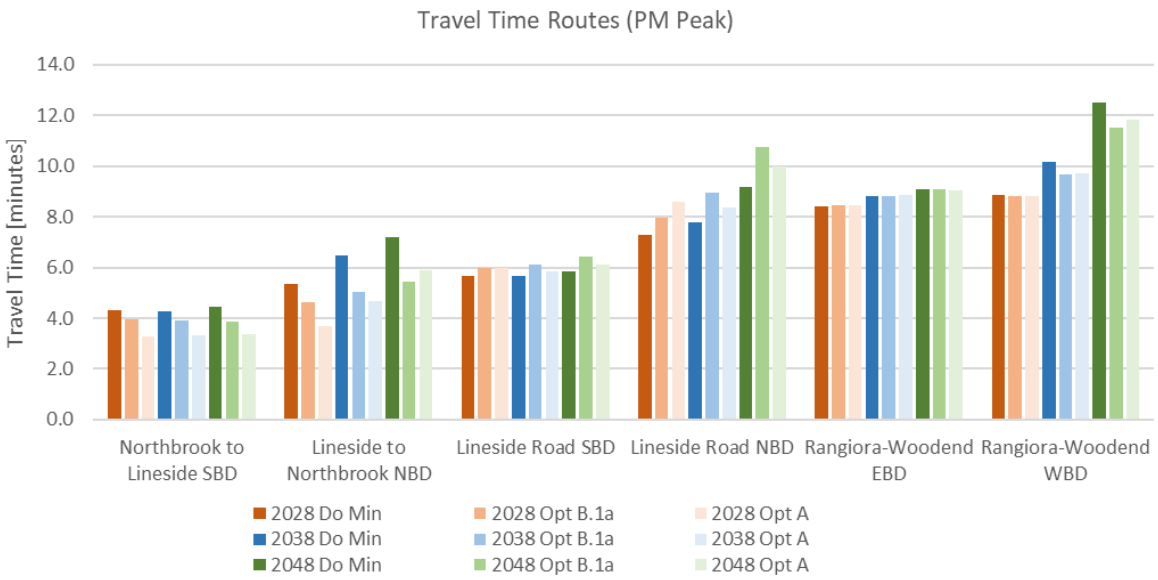


Figure 8-9 Travel times on key routes for select options – PM Peak (in minutes)

8.2.1 Travel Times to/from SH1

To assess the overall benefit (or disbenefit) on travel times, travel times from each zone in the traffic model were skimmed for both the Do Minimum and Options to/from SH1. As a proxy for the SH1 Lineside Road interchange, these times are to/from the zone representing Hakarau Road on the eastern side of the interchange (as times are extracted between two zones). Travel times are between origin-destination zones and do not infer the route taken.

The maps presented in Figure 8-10 to Figure 8-13 show the change in travel times in the peak direction. This method combines the reduced congestion on Southbrook Road with increased travel times on Lineside Road and demonstrates which parts of Rangiora are impacted by either four-laning of Southbrook Road (Option A) or an eastern link alignment (Option B1a is presented). Of note:

- Locations south of South Belt have an increase in travel time due to the increased traffic volumes on Lineside Road
- Travel time benefits are highest in central and eastern Rangiora
- There is generally a positive benefit across Rangiora zones for travel times in Option A
- The largest travel time benefits are seen in Option B where eastern zones have more direct connectivity to the south.
- Option B shows low level disbenefits in western zones due to the changes in traffic volumes on Lineside Road.

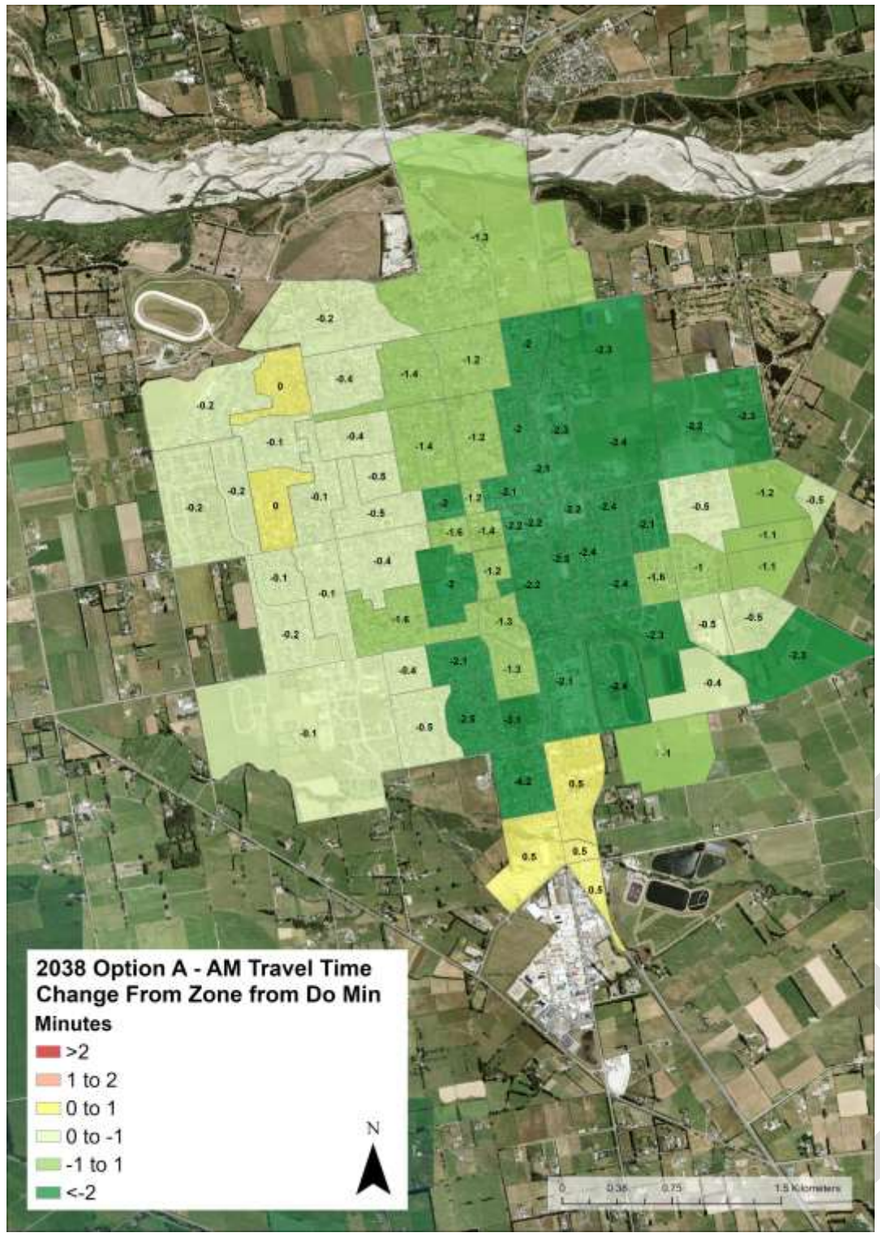


Figure 8-10 Change in travel time (in minutes) from Rangiora to SH1 in 2038, AM peak comparing Option A to the Do Minimum

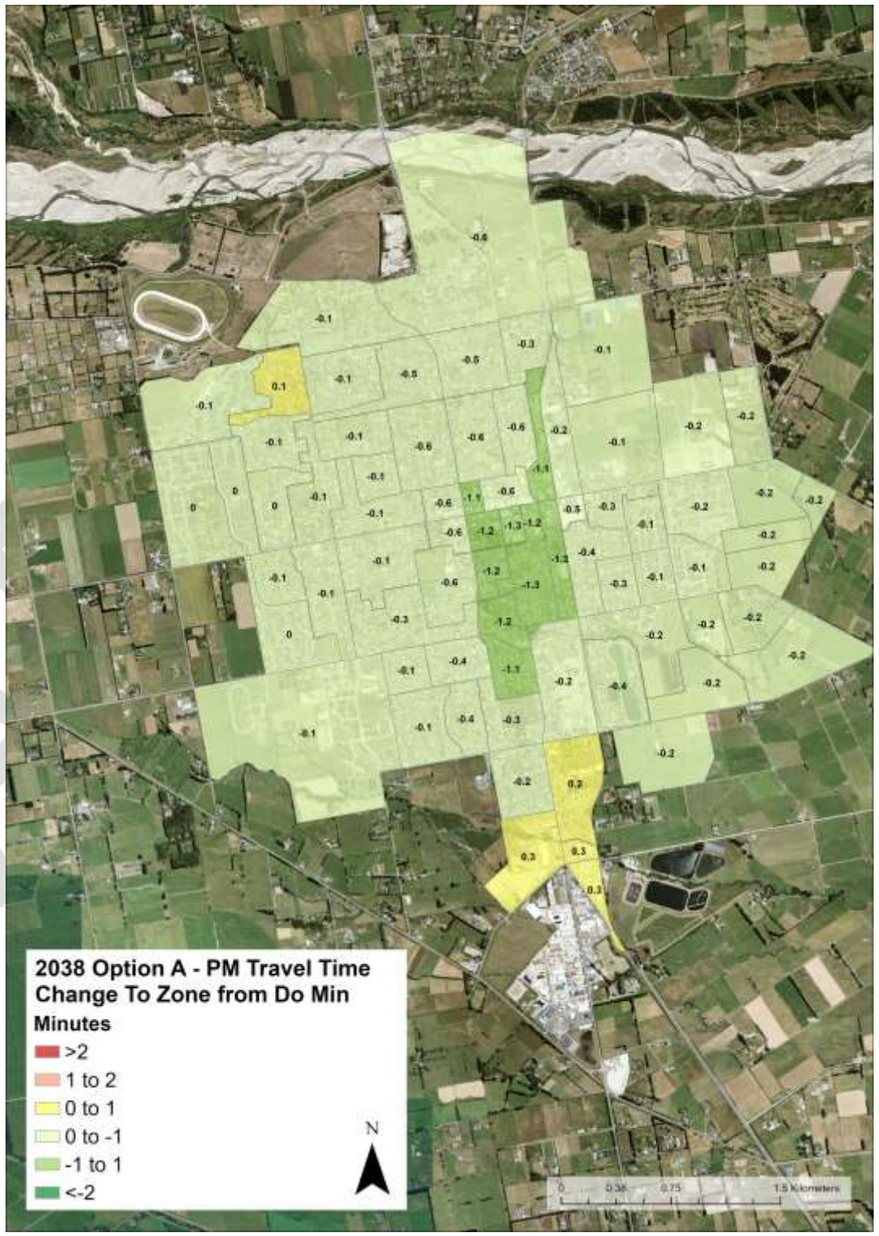


Figure 8-11 Change in travel time (in minutes) from SH1 to Rangiora in 2038, PM peak comparing Option A to the Do Minimum

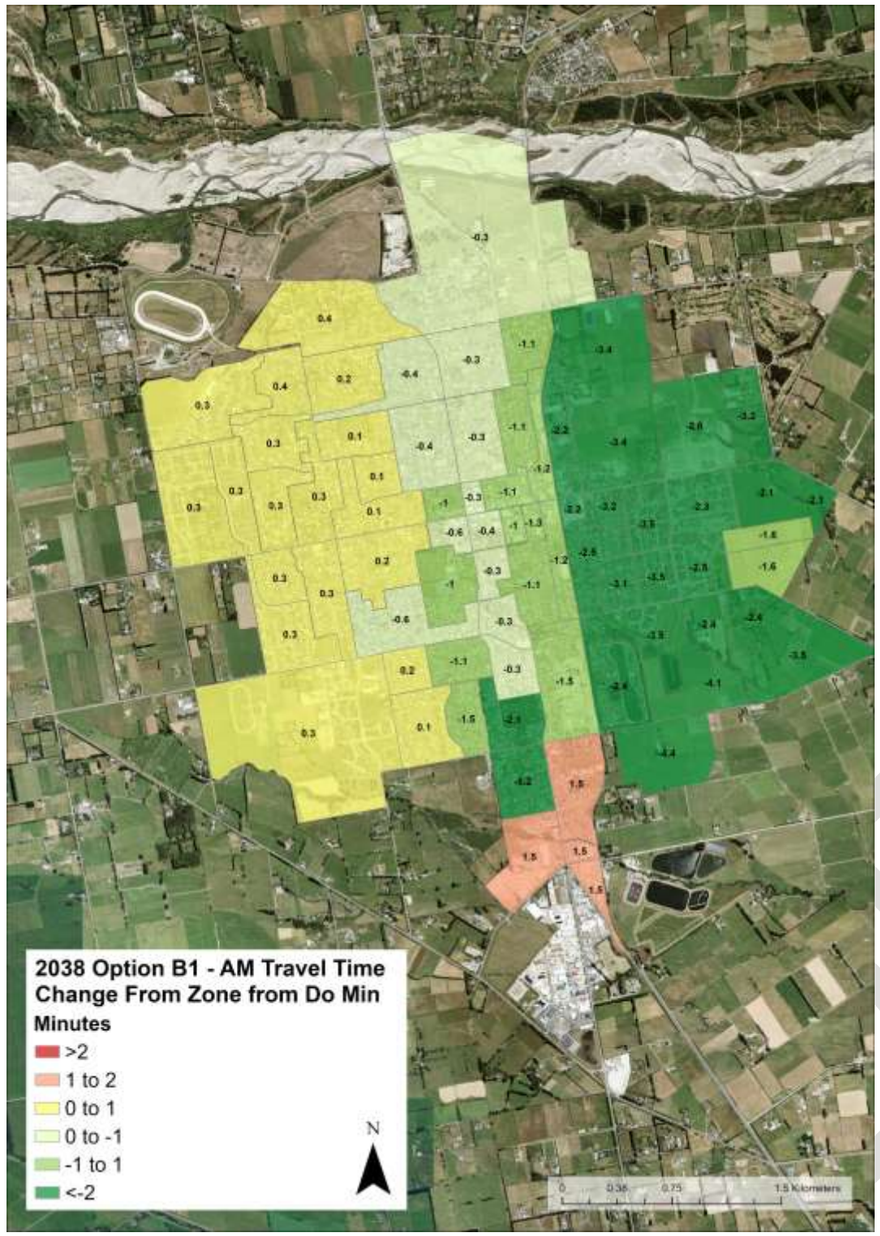


Figure 8-12 Change in travel time (in minutes) from Rangiora to SH1 in 2038, AM peak comparing Option B1a to the Do Minimum

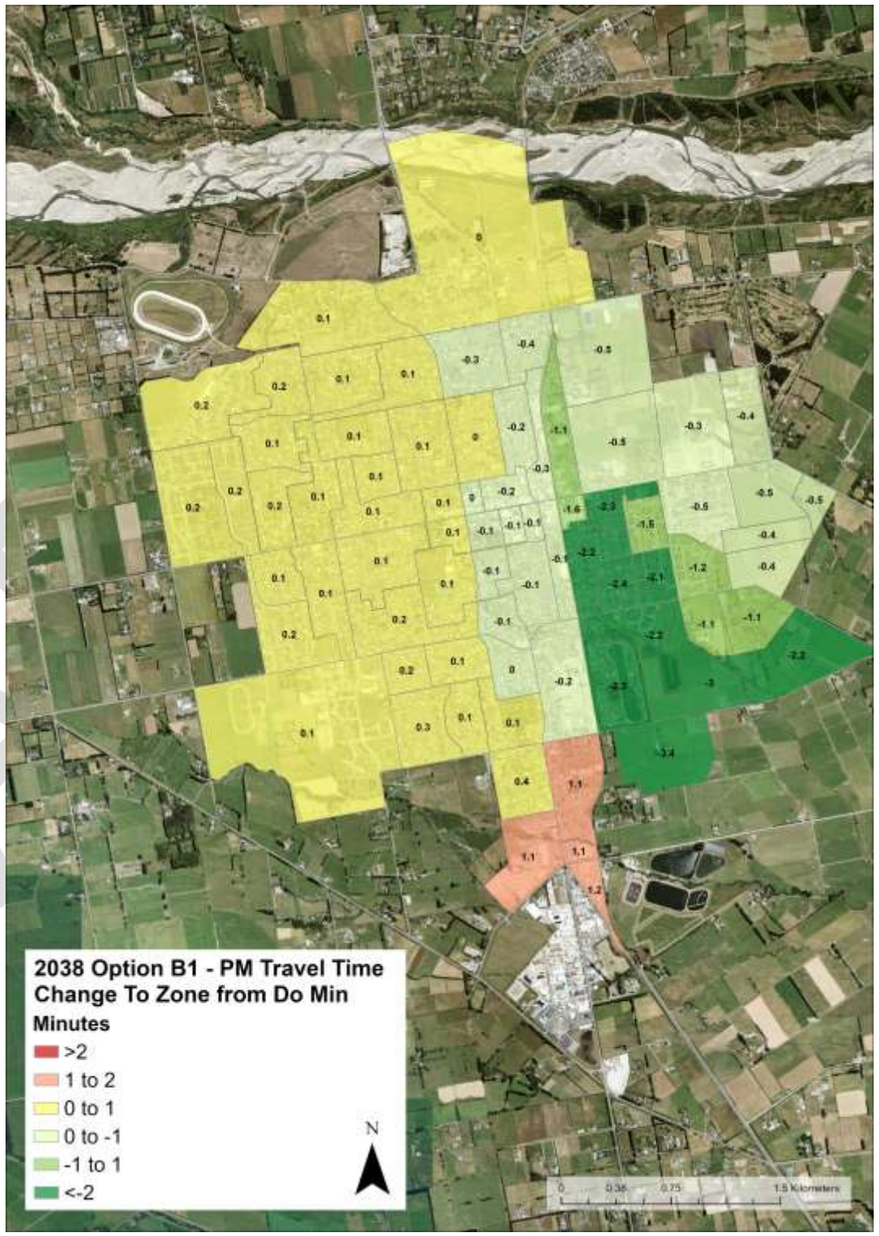


Figure 8-13 Change in travel time (in minutes) from SH1 to Rangiora in 2038, PM peak comparing Option A to the Do Minimum

8.3 Transport Effects – Intersection Performance

This section provides an overview of intersection Level of Service (LOS) for the AM and PM peak periods for the Do Minimum, Option A and Option B1. The LOS results for variants of Option B do not differentiate between options.

Table 8-5 provides a summary of the AM peak results. Delays are reported in seconds for either the weighted average (signals or roundabout) or the worst movement (priority intersections) to provide a concise summary. A full set of results are provided within **Appendix D** by approach for each option. Volumes represent the peak hour 08:00 to 09:00.

Similarly, Table 8-6 provides the corresponding PM peak results for 16:30 to 17:30.

The following trends and observations are drawn from the LOS tables:

- Delays at Coldstream Road increase with all options in the PM peak from 2038 by when the connection through to Kippenberger Avenue is established. This is caused by the right turn onto Ashley Street.
- The performance of the Ivory Street / Northbrook Road intersection improves substantially with the introduction of traffic signals in Option A. Option B also shows reduced delays at this intersection but typically has a similar LOS to the Do Minimum.
- The traffic signals on Southbrook Road operate with reduced average delay and better LOS in all options.
- Option B variants improve the LOS on minor road (priority) approaches to Percival Street
- Intersections along the Option B alignments operate at LOS B/C from 2038.
- Traffic signals at the Lineside Road intersections of Todds Road and Flaxton Road improve intersection operation from LOS F (in Do Minimum and Option B) to LOS A/B in Option A.

Table 8-5 Intersection LOS – AM Peak Hour (08:00 to 09:00)

Intersection LOS for AM Peak	2028									2038									2048								
	Do Minimum			Option A			Option B.1a			Do Minimum			Option A			Option B.1a			Do Minimum			Option A			Option B.1a		
	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS
Ashley Street / Coldstream Road	857	11	B	972	13	B	933	11	B	1,058	13	B	1,133	15	B	1,169	11	B	1,304	24	C	1,324	25	C	1,302	19	C
Ashley Street / High Street	1,333	25	C	1,543	28	C	1,311	25	C	1,472	27	C	1,688	30	C	1,345	26	C	1,641	30	C	1,852	33	C	1,568	29	C
Ivory Street / Northbrook Road	1,309	23	C	1,528	14	B	1,158	16	C	1,566	91	F	1,686	24	C	1,392	29	D	1,601	141	F	1,816	34	C	1,554	47	E
Percival Street / Victoria Street	1,535	38	E	1,872	46	E	1,383	29	D	1,609	50	E	1,967	54	F	1,473	36	E	1,632	62	F	2,109	68	F	1,549	42	E
Percival Street / Johns Road	1,657	42	E	1,997	52	F	1,527	37	E	1,784	57	F	2,131	57	F	1,611	39	E	1,807	73	F	2,248	74	F	1,637	42	E
Percival Street / Charles Street	1,505	36	E	1,927	56	F	1,359	25	C	1,831	127	F	2,203	79	F	1,397	36	E	1,871	179	F	2,375	115	F	1,459	45	E
Southbrook Road / South Belt / Percival Street / Boys Road	2,045	46	D	2,405	22	C	1,819	29	C	2,066	56	E	2,837	44	D	2,007	30	C	1,953	24	C	3,008	50	D	2,082	34	C
Southbrook Road / Torlesse Street	1,873	7	A	2,170	5	A	1,603	6	A	1,944	31	C	2,424	6	A	1,631	6	A	1,912	27	C	2,656	7	A	1,653	6	A
Southbrook Road / Pak 'n Save supermarket	1,972	7	A	2,265	5	A	1,735	6	A	1,952	7	A	2,462	5	A	1,736	6	A	1,914	7	A	2,649	5	A	1,747	6	A
Lineside Road / Todds Road	1,866	79	F	2,118	9	A	1,540	41	E	1,828	113	F	2,282	10	A	1,499	41	E	1,810	243	F	2,492	11	B	1,508	45	E
Lineside Road / Flaxton Road	1,866	38	E	2,101	11	B	1,614	24	C	1,805	36	E	2,271	13	B	1,656	23	C	1,777	39	E	2,389	15	B	1,667	25	C
Coldstream Road / REL	366			303			428			583	8	A	549	8	A	762	10	A	771	10	A	669	9	A	851	11	B
Kippenberger Ave / MacPhail Ave	781	11	B	787	11	B	992	11	B	1,156	12	B	1,245	12	B	1,519	13	B	1,422	13	B	1,278	12	B	1,627	15	B
Northbrook Road / MacPhail Ave	287	6	A	219	5	A	750	10	A	954	12	B	811	10	A	1,490	12	B	1,030	12	B	1,047	13	B	1,646	14	B
REL / Boys Road	98	11	B	146	11	B	767	10	A	96	11	B	154	11	B	1,293	12	B	106	11	B	138	11	B	1,327	12	B
REL / Marsh Road	137			128			590	9	A	156			144			1,015	16	C	197			208			1,085	19	C
Lineside Road / REL	1,391			1,545			1,636	13	B	1,367			1,615			1,941	14	B	1,413			1,716			2,000	14	B

Table 8-6 Intersection LOS – PM Peak Hour (16:30 to 17:30)

Intersection LOS for PM Peak	2028									2038									2048								
	Do Minimum			Option A			Option B.1a			Do Minimum			Option A			Option B.1a			Do Minimum			Option A			Option B.1a		
	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS
Ashley Street / Coldstream Road	1,115	17	C	1,156	20	C	1,158	19	C	1,422	45	E	1,503	68	F	1,525	68	F	1,952	195	F	1,986	254	F	2,056	210	F
Ashley Street / High Street	1,707	29	C	2,012	36	D	1,638	28	C	2,075	36	D	2,282	46	D	2,006	33	C	2,345	51	D	2,487	71	E	2,310	46	D
Ivory Street / Northbrook Road	1,672	40	E	1,952	18	B	1,504	23	C	1,955	98	F	2,123	24	C	1,839	65	F	2,020	130	F	2,155	27	C	1,885	92	F
Percival Street / Victoria Street	1,787	73	F	2,308	98	F	1,701	73	F	1,927	107	F	2,297	108	F	1,807	84	F	1,950	127	F	2,350	118	F	1,806	92	F
Percival Street / Johns Road	1,908	64	F	2,549	73	F	1,883	53	F	2,053	83	F	2,489	94	F	1,960	61	F	2,018	97	F	2,506	91	F	1,937	67	F
Percival Street / Charles Street	1,850	74	F	2,462	90	F	1,712	61	F	1,987	139	F	2,549	123	F	1,769	84	F	2,063	156	F	2,701	128	F	1,809	97	F
Southbrook Road / South Belt / Percival Street / Boys Road	2,312	45	D	3,031	21	C	2,081	34	C	2,753	61	E	3,443	55	D	2,391	34	C	2,978	66	E	3,719	30	C	2,511	41	D
Southbrook Road / Torlesse Street	2,100	11	B	2,808	5	A	1,915	10	A	2,306	14	B	2,947	6	A	2,027	13	B	2,520	18	B	3,254	8	A	2,045	14	B
Southbrook Road / Pak 'n Save supermarket	2,280	24	C	2,934	12	B	2,061	19	B	2,361	32	C	3,002	12	B	2,100	20	B	2,437	39	D	3,193	12	B	2,123	22	C
Lineside Road / Todds Road	2,146	127	F	2,767	4	A	1,896	90	F	2,174	148	F	2,813	5	A	1,884	97	F	2,230	163	F	3,006	6	A	1,939	110	F
Lineside Road / Flaxton Road	2,107	74	F	2,722	16	B	1,985	59	F	2,125	95	F	2,728	17	B	2,013	84	F	2,173	110	F	2,915	19	B	2,068	127	F
Coldstream Road / REL	678			534			742			840	10	A	800	10	A	1,015	13	B	953	12	B	895	11	B	1,069	14	B
Kippenberger Ave / MacPhail Ave	1,048	11	B	983	10	A	1,178	11	B	1,712	13	B	1,641	13	B	1,874	15	B	1,824	14	B	1,759	13	B	2,067	18	B
Northbrook Road / MacPhail Ave	356	6	A	291	6	A	961	10	A	996	11	B	965	12	B	1,588	12	B	1,022	12	B	1,050	12	B	1,617	13	B
REL / Boys Road	135	11	B	177	11	B	894	10	A	213	11	B	210	11	B	1,413	11	B	230	11	B	245	11	B	1,613	12	B
REL / Marsh Road	168			146			762	10	A	201			200			1,070	15	B	286			307			1,308	21	C
Lineside Road / REL	1,680			1,984			2,010	16	B	1,815			1,958			2,260	19	B	1,927			2,052			2,480	24	C

8.4 Network Statistics

Network statistics for vehicle kilometres travelled and vehicle hours travelled are used for the economic analysis of options in conjunction with value of time and vehicle operating costs. The change in these metrics is presented in Figure 8-14.

- In 2028, Option A has the largest reduction in distance travelled. This is likely due to the increase in capacity on the Southbrook Road corridor combined with the central location being accessible to both the east and west sides of Rangiora.
- 2028 has less development growth in eastern Rangiora than the 2038- and 2048-year forecasts and in subsequent years the change in VKT is more comparable between options.
- In all years, Option A has higher vehicle hour travelled than Option B variants.

	VKT (km.veh)			Veh.Hr		
Option	**2028**	**2038**	**2048**	**2028**	**2038**	**2048**
Option A	-7,339	-8,819	-11,117	-121	-205	-82
Option B.1a	-1,179	-7,141	-10,077	-167	-323	-589
Option B.2.1						
Option B.2.2						

Figure 8-14 Change in network statistics between options and Do Minimum

8.5 Safety

To complete from economics memo

8.6 Resilience

While Option A improves local access by reducing congestion, there is no additional resilience provided beyond an extra lane.

Option B alignments improve local road connectivity by providing an arterial road alternative to Percival Street and Southbrook Road. When completed it also enables an additional north-south route from the Ashley River to SH71 Lineside Road. This alternative road provides route resilience.

8.7 Public Transport

Public transport routes to/from Rangiora use Lineside Road, Southbrook Road and Rangiora-Woodend Road. Bus services will be impacted by increasing congestion on these routes in future years (in the Do Minimum). Route 91 will be particularly affected by increasing delays at the Southbrook Road / South Belt signalised intersection.

The reductions in general traffic travel times on Southbrook Road and Rangiora-Woodend Road will benefit public transport on these roads, improving bus travel times. This is partially offset by the increase in travel time forecast on Lineside Road. Existing bus routes primarily serve the western side of Rangiora so with the introduction of a new arterial in Option B, and with continued residential development in the east, there is an opportunity to review public transport routes to increase access.

The residential development in eastern Rangiora will increase patronage on Route 97.

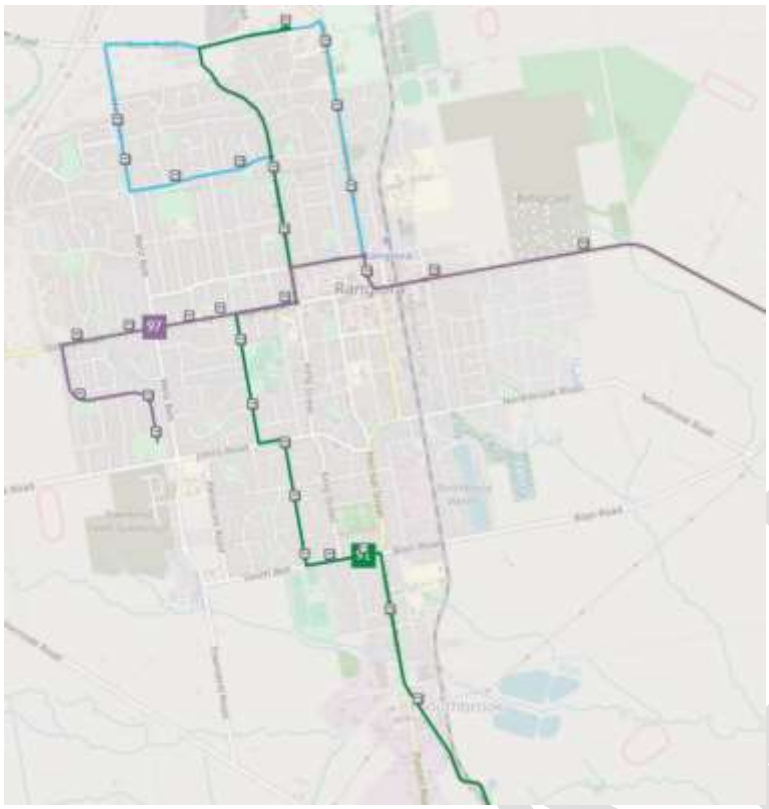


Figure 8-15 Bus routes in Rangiora at March 2025

9 Economic Analysis

To complete from economics memo

10 Summary

The optioneering and subsequent technical assessment of options, narrowed focus to the Do Minimum, four-laning of Southbrook Road and four variations of the existing REL route designation.

- The Do Minimum shows increasing traffic volumes and congestion on Southbrook Road leading traffic to take routes which are further and wider – for example, increasing traffic volumes on Rangiora-Woodend Road and Flaxton Road.
- Four laning of Southbrook Road provides additional north-south capacity and reduces travel times on this route. This leads to induced traffic, increasing severance which is compounded by the loss of parking and cycle facilities.
- Four variants of the REL alignment were assessed. While there are subtle differences in localised routing around Southbrook and the connection to Lineside Road, there is minimal difference between these options, and all appear to function at a similar level. Rephrased that, from a transportation perspective, none of the alternative REL alignments perform notable better than the designated alignment.

Appendices

Appendix A Review of CAST Model

As part of this work, we have undertaken a high-level review of the CAST model performance in current (2021) and future years. This has included checks on Southbrook Road, routes to/from SH1 and growth forecasts provides. The objective of these checks is to an understand the representation of future conditions and the level of confidence when assessing options. Revalidation or rebasing the CAST model is outside the scope of this analysis.

A.1 Southbrook Road

Traffic counts recorded on Percival Street and Southbrook Road in 2022[4] are compared against CAST v23a model volumes for 2021. This shows a reasonable level of model validation on the Southbrook north-south route, noting that Southbrook Road northbound in the AM peak is underestimated.

Table 10-1 Check of traffic volumes on Percival St & Southbrook Road (2022 count vs 2021 model)

			AM Peak 08:00-09:00				PM Peak 16:30-17:30			
Road	**Location**	**Direction**	**Cnt**	**Mod**	**Diff**	**GEH**	**Cnt**	**Mod**	**Diff**	**GEH**
PERCIVAL ST	north of South Belt	NBD	615	588	-27	1	764	848	84	3
PERCIVAL ST	north of South Belt	SBD	547	543	-4	0	497	576	80	3
SOUTHBROOK RD	south of Denchs Rd	NBD	767	615	-152	6	1,034	1,001	-32	1
SOUTHBROOK RD	south of Denchs Rd	SBD	957	922	-35	1	784	794	10	0

A similar check was applied using traffic counts from November 2024 on Southbrook Road, showing a level of similar underestimation.

Table 10-2 Check of traffic volumes on Southbrook Road (2024 count vs 2021 model)

			AM Peak 08:00-09:00				PM Peak 16:30-17:30			
Road	**Location**	**Direction**	**Cnt**	**Mod**	**Diff**	**GEH**	**Cnt**	**Mod**	**Diff**	**GEH**
SOUTHBROOK RD	south of Denchs Rd	NBD	757	615	-141	5	968	1,001	34	1
SOUTHBROOK RD	south of Denchs Rd	SBD	922	922	0	0	932	794	-138	5

Travel times in both directions on Southbrook Road between Northbrook Road and Flaxton Road are within the range of observed travel times, when comparing the 2021-year model with August 2024 observed TomTom data. The AM peak in both directions sits at the 65th percentile and PM Peak northbound around the 50th percentile. In general, the model overestimates median travel times on Southbrook Road.

[4] As half hour time steps not available for the counts, the PM peak count (16:30-17:30 is approximated from two one-hour counts (16:00-17:00 & 17:00-18:00)

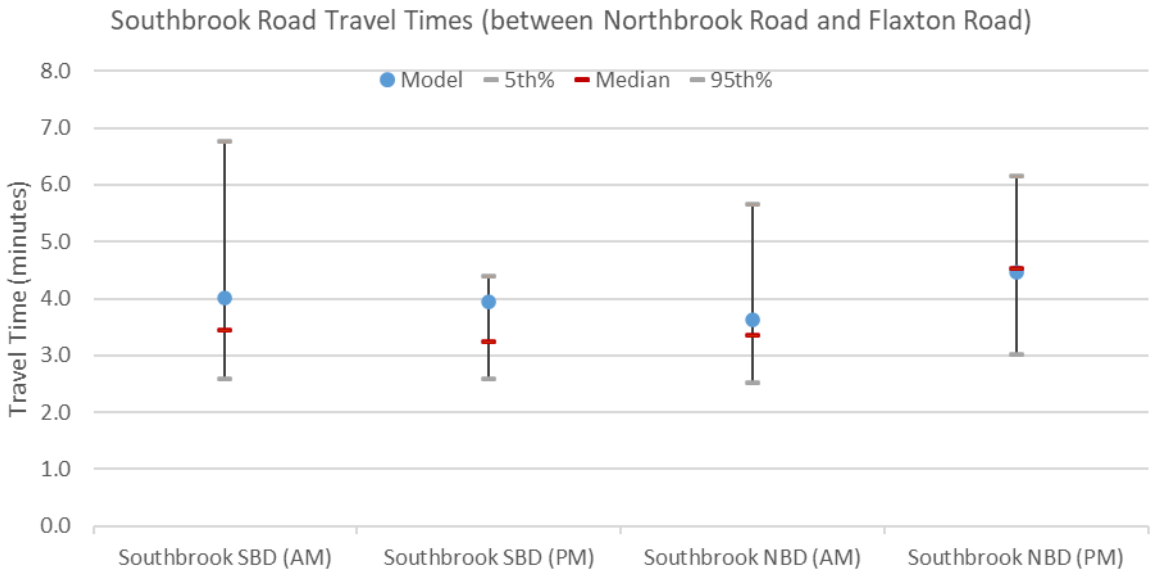


Figure 10-1 Graph of Southbrook Road observed vs modelled travel times

Table 10-3 Comparison of Southbrook Road observed vs modelled travel times

Route	TomTom Observed (August 2024)			CAST Model Year 2021		
Time Period	**5th%**	**Median**	**95th%**	**Model**	**Difference to Median**	
Southbrook Route – Southbound (Northbrook Road to Flaxton Road)						
AM Peak	2.6	3.4	6.8	4.0	+0.6	17%
PM Peak	2.6	3.2	4.4	4.0	+0.7	22%
Southbrook Route – Northbound (Flaxton Road to Northbrook Road)						
AM Peak	2.5	3.4	5.7	3.6	+0.3	8%
PM Peak	3.0	4.5	6.2	4.5	-0.1	-2%

Cumulative travel time along the route is presented as time against distance graphs in Figure 10-2 to Figure 10-5. These show that the traffic model represents most of the delay along the route at the Southbrook Road / Boys Road / South Belt signals.

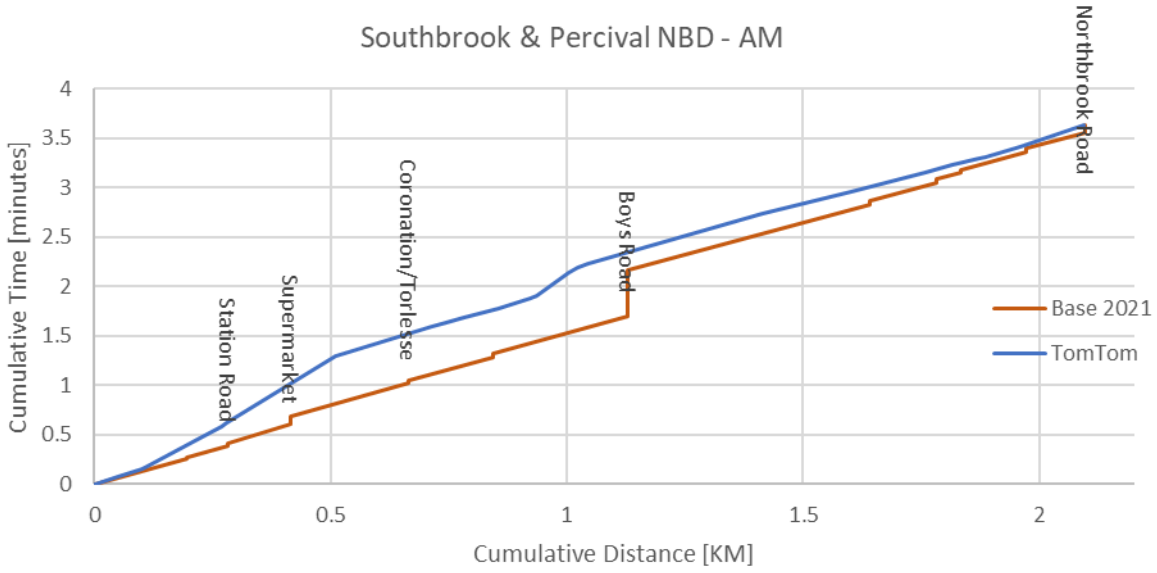


Figure 10-2 Cumulative travel time on Southbrook Road, northbound, in AM Peak (2021 model)

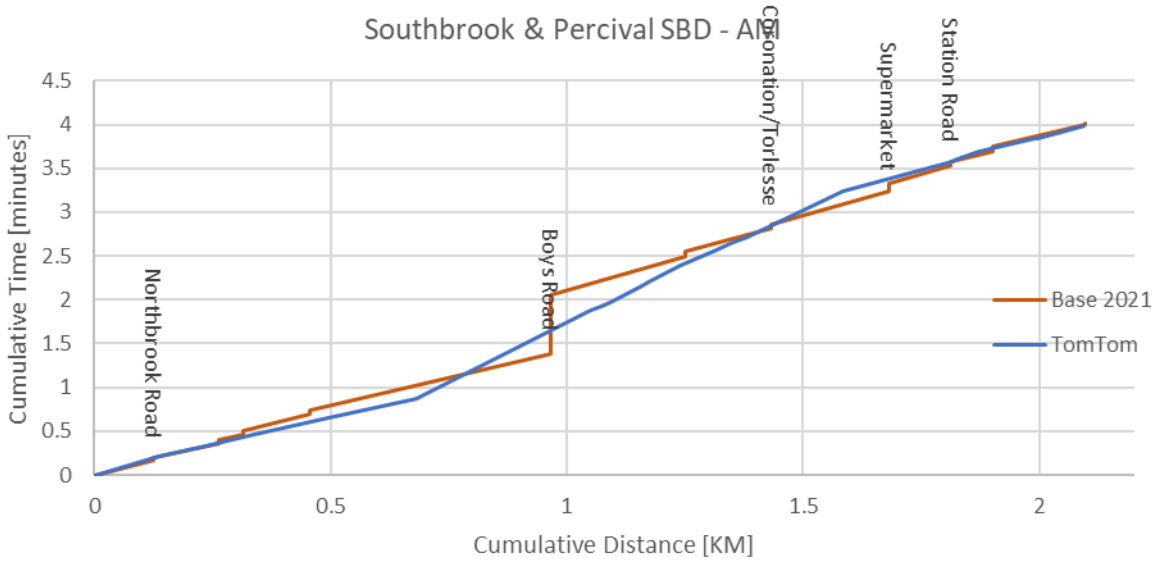


Figure 10-3Cumulative travel time on Southbrook Road, southbound, in AM Peak (2021 model)

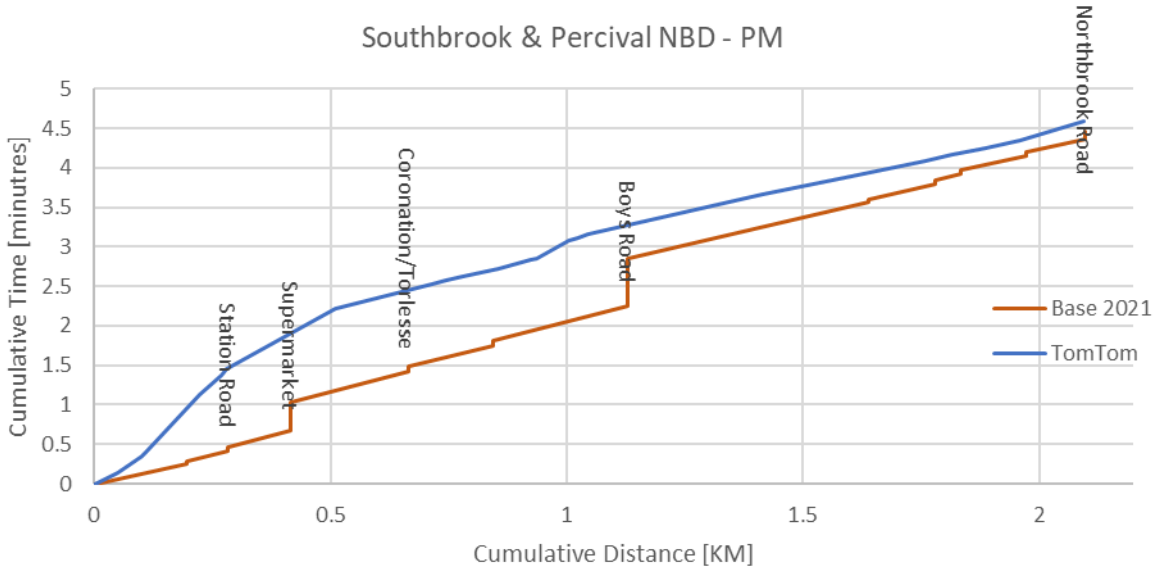


Figure 10-4 Cumulative travel time on Southbrook Road, northbound, in PM Peak (2021 model)

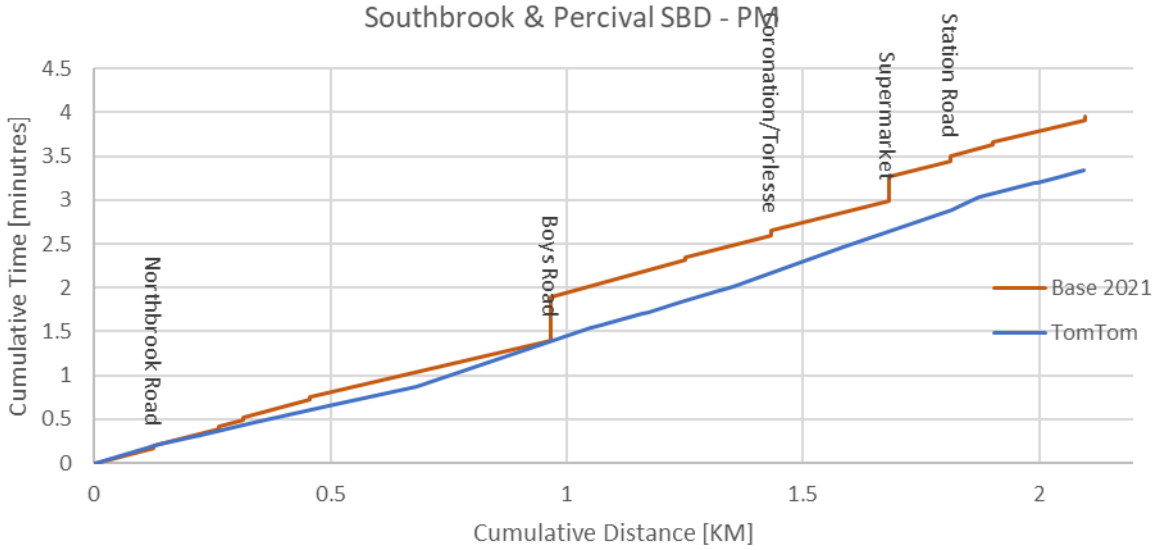


Figure 10-5 Cumulative travel time on Southbrook Road, southbound, in PM Peak (2021 model)

A.2 Routes to/from SH1

A further check reviewed traffic volumes on routes between SH1 and Rangiora as future year models suggested high traffic volumes on Greens Road.

The CAST model includes a series of validation screenlines in Figure 10-6 capturing traffic to/from Rangiora ("W5"), between Rangiora and SH1 ("W3"), and to the south ("W2"). These are understood to have achieved model validated criteria in the model update.

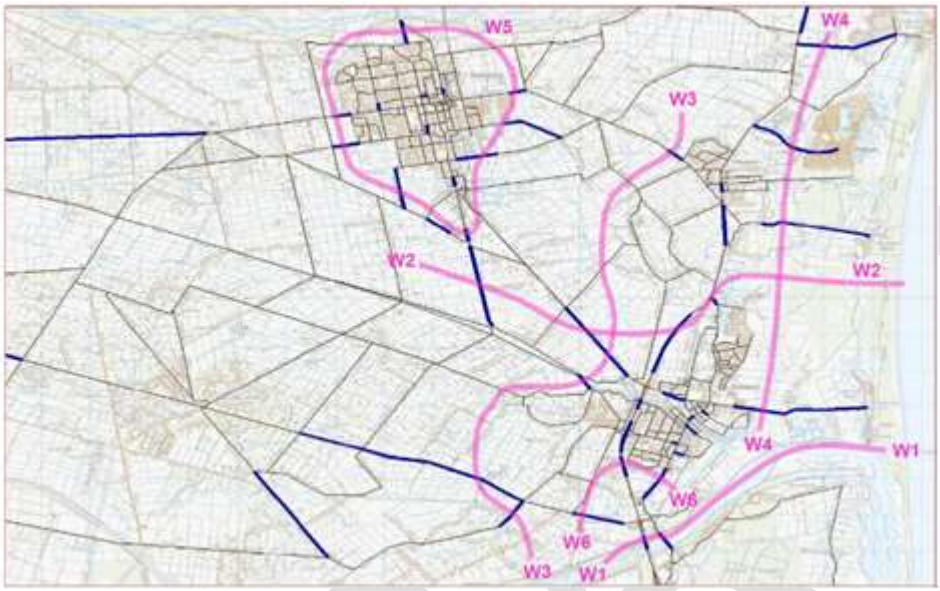


Figure 10-6 Screenlines used for CAST model validation

One notable omission from screenline "W3" is Tuahiwi Road and Greens Road meaning that there is a gap. The blue lines in the image below show where counts used for model validation are located. Revells Road is also missing from screenline "W2" capturing north/south traffic.

Council have provided traffic counts from 2021 which do not appear to have been used in the CAST model update. This completes a screenline in Figure 10-7 similar to "W3" and captures a route following Tuahiwi Road - Greens Road – Church Bush Road – Revells Road that traffic is using in the model.

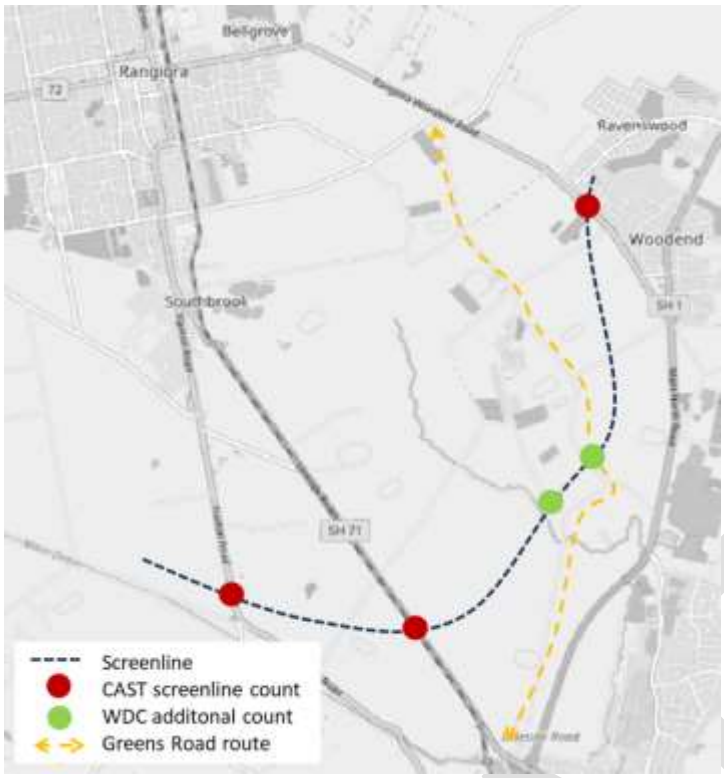


Figure 10-7 Screenline and count location

Comparing the traffic volumes across this screenline in Table 10-4 demonstrates:

- Lineside Road traffic volumes are low and Flaxton Road volumes are high, but both have acceptable GEH values
- Greens Road has significantly higher traffic volumes modelled than actual, in both peaks and both directions. Tuahiwi Road through the settlement is underutilised which account for a small part of the difference.
- Generally, more traffic is shown on these routes to & from Rangiora (except morning peak to Rangiora) which stems from the broader CAST model demands.

Table 10-4 Traffic volumes on screenline Rangiora to/from SH1 (2021 & 2022 counts vs 2021 model)

			AM Peak 08:00-09:00				PM Peak 16:30-17:30			
Road	**Location**	**Direction**	**Cnt**	**Mod**	**Diff**	**GEH**	**Cnt**	**Mod**	**Diff**	**GEH**
Flaxton Rd	South Fernside	NBD	330	373	43	2	691	827	136	5
Flaxton Rd	South Fernside	SBD	448	494	46	2	388	432	44	2
Lineside Rd	West Revells	NBD	603	530	-73	3	915	856	-59	2
Lineside Rd	West Revells	SBD	662	636	-26	1	713	694	-19	1
TUAHIWI RD	north of Cox Rd	NBD	67	26	-41	6	67	37	-30	4
TUAHIWI RD	north of Cox Rd	SBD	73	24	-49	7	33	17	-16	3
GREENS RD	north of Church Bush Rd	NBD	34	153	119	12	80	495	415	24
GREENS RD	north of Church Bush Rd	SBD	32	349	317	23	27	214	187	17
Rangiora Woodend Rd	400m N Chinnerys Rd	NBD	325	198	-127	8	339	340	1	0
Rangiora Woodend Rd	400m N Chinnerys Rd	SBD	204	271	67	4	320	341	21	1
from Rangiora / to SH1		**SBD**	**1419**	**1774**	**355**	**9**	**1481**	**1698**	**218**	**5**
to Rangiora / from SH1		**NBD**	**1359**	**1278**	**-80**	**2**	**2092**	**2554**	**463**	**10**

A.3 Growth forecasts

The transport model is built on land use forecasts prepared by Waimakariri District Council and the Greater Christchurch Partnership, overseen by the Model Management Group. The forecasts are broadly consistent with Statistics NZ (sub-national) population forecasts released in 2017 when applying the Medium-High projection to Waimakariri District.

The previous and transport assessment showed growth of about 2,500 households in eastern rangiora compared to around 5,780 additional lots currently signalled for the area. In reviewing the traffic demands from CAST v23a models, there is a notable drop in demand for zones representing the eastern growth areas from 2021 to 2028 before they increase again to 2028 and 2038. These trends are not reflective of growth from ~400 existing houses to 5000+ houses.

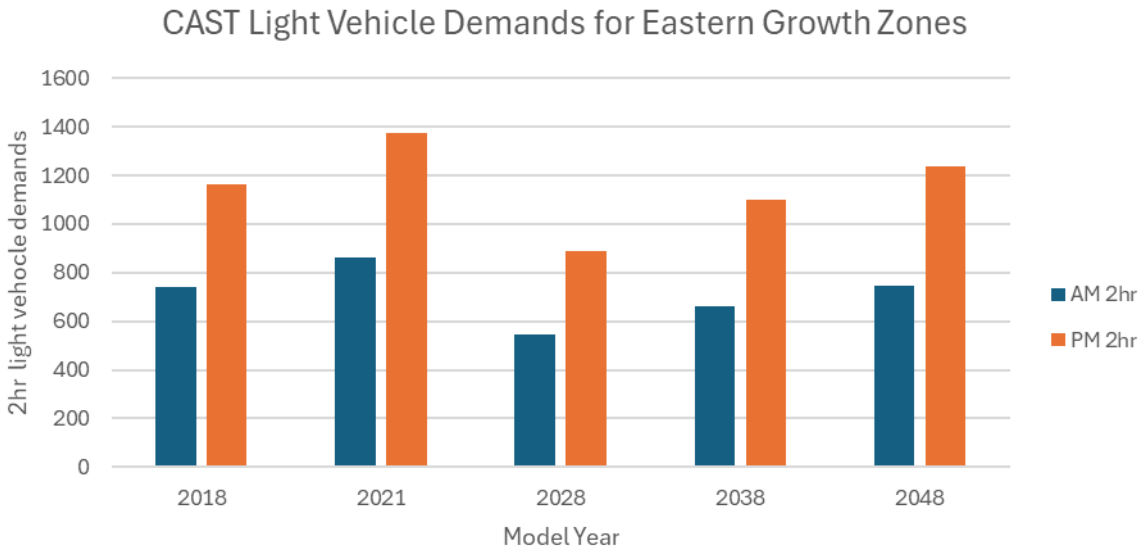


Figure 10-8 Future projections of traffic demand for eastern growth areas from CAST model v23a

Reviewing changes in population forecast in the CTM, Figure 10-9 shows the population in eastern rangiora (CTM zone 9) decreasing while growth is concentrated in the west (CTM zone 23 & 5) and centre of Rangiora (CTM zones 3, 6) There is no change in population forecast in CTM zone 8 where the Bellgrove subdivisions are underway.

To progress the modelling, the growth planned for eastern Rangiora (outlined in Table 3-1) has been applied to the CAST model demands for the forecast years. No changes are made to zones in the western growth areas given the model already represents development occurring there. This is the same approach that was used for assessing developer contributions (WSP, 2022).

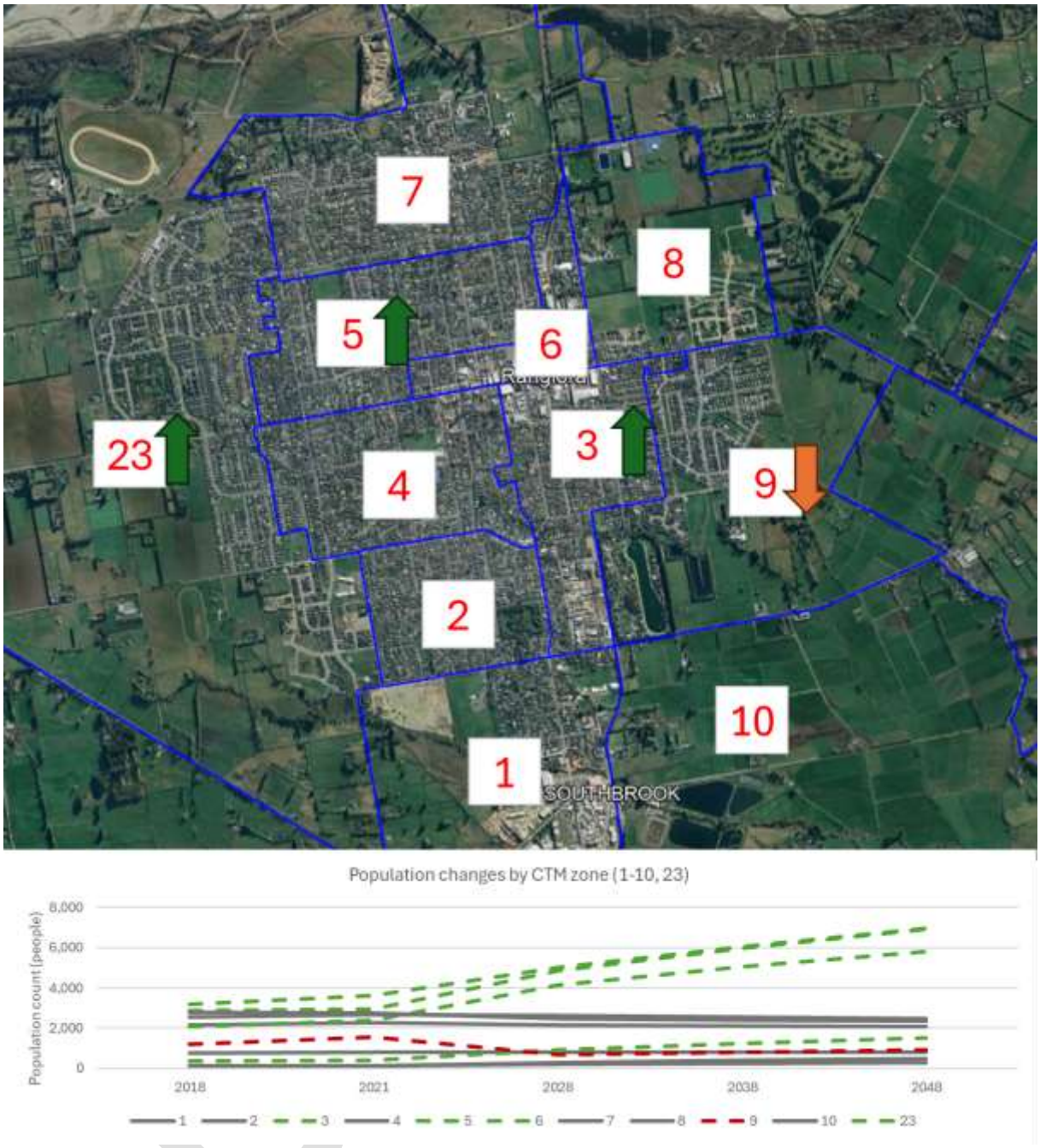


Figure 10-9 Change in population forecast in the CTM model for model zone numbers

Appendix B Model Network Assumptions

CTMs v21 Network Schemes

ID	Scheme Name	RCA	Opening Date	Workshop Model Yr	Modelled Year	CAST	CTM	Type	Location
301	Airport Southern Development Network	CCC	2016	2018	2018	Y	Y	Local Network	West
524	Fulton Hogan Development Network (CSW4)	CCC	2016	2018	2018	Y	Y	Local Network	South-West
2001	Intersection Improvement: Awatea /Wigram	CCC	2016	2018	2018	N	N	Signalised Intersection	South-West
162	Islington Park Drive Development	CCC	2016	2018	2018	Y	Y	Local Network	West
154	Marshland Rd Speed Reduction to 70kph (Prestons Rd to Belfast Rd)	CCC	2016	2018	2018	Y	Y	Speed Change	North-East
302	Pound Road (Resa) Deviation	CCC	2016	2018	2018	Y	Y	Deviation	West
728	Prestons Rd Signals at NW and NE Entrances to Prestons	CCC	2016	2018	2018	Y	Y	Signalised Intersection	North
184	Wigram Development Network (CSW1)	CCC	2016	2018	2018	Y	Y	Local Network	South-West
25	Wigram Magdala link (Overbridge)	CCC	2016	2018	2018	Y	Y	Network Improvements	South-West
610	Wigram Rd Speed Changes	CCC	2016	2018	2018	Y	Y	Speed Change	South-West
9999	CBD Speed Changes (AAC)	CCC	2016	2018	2018	Y	Y	Speed Change	CBD
612	Sparks Road Speed Changes	CCC	2017	2018	2018	Y	Y	Speed Change	South-West
501	Deans Ave/Riccarton Rd Signals	CCC	2018	2018	2018	Y	Y	Signalised Intersection	West
519	Frankleigh Ave/Lyttelton St/Sparks Rd Signals	CCC	2018	2018	2018	Y	Y	Signalised Intersection	South-West
719	Halswell / Augustine 4-Way Signals	CCC	2018	2018	2018	Y	Y	Signalised Intersection	South-West
520	Hoon Hay Rd/Sparks Rd Signals	CCC	2018	2018	2018	Y	Y	Signalised Intersection	South-West
709	Belfast /Main North	CCC	2019	2018	2018	Y	Y	Signalised Intersection	North
801	Pegasus Rbt	NZTA	2015	2018	2018	Y	Y	Roundabout	Waimakariri
174	Pound Road Deviation to SH1 (Close Barters Rd)	NZTA	2017	2018	2018	Y	Y	Deviation	West
79	Western Corridor - Groynes to Sawyers	NZTA	2017	2018	2018	Y	Y	Widening	West
305	Airport Southern Access Interchange	NZTA	2018	2018	2018	Y	Y	Network Improvements	West
304	Memorial Russley Interchange	NZTA	2018	2018	2018	Y	Y	Network Improvements	West
1111	Norwich Quay, Lyttelton Ped signals.	NZTA	2018	2018	2018	N	N	Ped signals (E Sutton Quay)	Lyttelton
298	Western Belfast Bypass	NZTA	2018	2018	2018	Y	Y	Network Improvements	North
35	Western Corridor - Sawyers to Memorial	NZTA	2018	2018	2018	Y	Y	Widening	West
408	Brougham/Collins/Simeon LILO Signals & Cycle/Ped Crossing	NZTA/CCC	2015	2018	2018	Y	Y	Signals	West
810	Agricultural Park Access (Templetons/Halswell/Augustine)	NZTA/CCC	2018	2018	2018	Y	Y	Network Improvements	South-West
201	Rolleston Development Network (Dynes Rd and Rolleston Drive-SH1	SDC	2016	2018	2018	Y	Y	Local Network	Selwyn
480	Tennyson/Kidman Roundabout	SDC	2016	2018	2018	Y	Y	Roundabout	Selwyn
482	Traffic Signals at Masefield Dr/Rolleston Dr	SDC	2018	2018	2018	Y	Y	Signalised Intersections	Selwyn
1111	Traffic Signals Hoskyns/Jones Rd Intersection Upgrade	SDC/NZTA	2016	2018	2018	Y	Y	Signalised Intersection	Selwyn
4002	Traffic Signals at Hoskyns/Jones Rd	SDC/NZTA	2018	2018	2018	Y	Y	Signalised Intersection	Selwyn
450	Ashley/High/Ivory Intersection (Red Lion corner)	WDC	2015	2018	2018	Y	Y	Signalised Intersection	Waimakariri
3001	Flaxton / Lineside Intersection Realignment	WDC	2015	2018	2018	Y	Y	Deviation	Waimakariri
450	High Street / Ashley Street Reconfiguration	WDC	2015	2018	2018	Y	Y	Signalised Intersection	Waimakariri
451	High Street/Eastbelt Roundabout	WDC	2015	2018	2018	Y	Y	Roundabout	Waimakariri
515	Ohoka Rd/Island Rd (W Ohoka offramp)	WDC	2015	2018	2018	Y	Y	Network Improvement	Waimakariri
3002	Southbrook Road Traffic Signals (pak'n'save)	WDC	2016	2018	2018	Y	N	Signalised Intersection	Waimakariri
452	Southbrook Road/South Belt Intersection Upgrade	WDC	2016	2018	2018	Y	Y	Signalised Intersection	Waimakariri
3003	Bayliss Drive Extension to Lees Rd	WDC	2018	2018	2018	Y	N	New Link	Waimakariri
3004	Beach / Smith / Williams Rbt	WDC	2018	2018	2018	Y	Y	Roundabout	Waimakariri
3003	Rangiora NW Bypass (Silverstream)	WDC	2018	2018	2018	Y	Y	New Link	Waimakariri
3333	Replacement of Ashley River Bridge	WDC/NZTA	2015	2018	2018	N	N	Bridge Upgrade	Waimakariri
2004	Disused Christchurch Red Zone Roads		2016	2018	2018	Y	Y	Road Stopping	East
2002	CBD 30kph Speed Limit Extension	CCC	2019	2021	2021	Y	Y	Speed Change	CBD
715	Sparks / Hendersons Signalised 4-Way	CCC	2019	2021	2021	Y	Y	Signalised Intersection	South-West
525	Prestons Development Network	CCC	2020	2021	2021	Y	Y	Local Network	North-East
169	Belfast Industrial Development Network (CB1)	CCC	2021	2028	2021	Y	Y	Local Network	North
210	Cranford St 4 Laning - NAE to Innes	CCC	2021	2028	2021	Y	Y	Widening	North
999	Hereford St (Manchester-Cambridge)	CCC	2021	2028	2021	Y	Y	AAC Improvements	CBD
410	Intersection Safety: Barrington/ Lincoln/ Whiteleigh	CCC	2021	2028	2021	Y	Y	Signalised Intersection	South-West
999	Victoria St	CCC	2021	2028	2021	Y	Y	AAC Improvements	CBD
1001	Perimeter Rd / Ron Guthrey Rd Signals	CIAL	2019	2028	2021	Y	Y	Signalised Intersection	West
1111	Pineacres Intersection Upgrade	NZTA	2019	2028	2021	N	N	Saftey Improvement	Waimakariri
739	Broughs Rd Extension	NZTA	2019	2028	2021	Y	Y	Deviation	West
94	Christchurch Southern Motorway (CSM1 and CSM2)	NZTA	2019	2028	2021	Y	Y	Network Improvements	South-West
95	Main South Rd Four-Laning (MSRFL) inc Weedons Ross Interchange	NZTA	2019	2028	2021	Y	Y	Network Improvements	South-West
527	Marshes Rd/Shands Rd Signals	NZTA	2019	2028	2021	Y	Y	Signalised Intersection	South-West
611	Halswell Road Speed Changes	NZTA	2021	2028	2021	Y	Y	Speed Change	South-West
8	Northern Arterial Belfast South Facing Ramps	NZTA	2021	2028	2021	Y	Y	Network Improvements	North
7	QE II 4 Laning - Main North Rd to Innes Rd	NZTA	2021	2028	2021	Y	Y	Widening	North
403	Waimak Bridge 3N 2S + HOV	NZTA	2021	2028	2021	Y	Y	Widening	Waimakariri
1002	Woodend Corridor Improvements (Ped Safety)	NZTA	2021	2028	2021	Y	Y	Network Improvements	Waimakariri
6	Northern Arterial with Extension (QEII Dr to Cranford St)	NZTA/CCC	2021	2028	2021	Y	Y	Network Improvements	North
6	Northern Arterial with Extension (QEII Dr to Cranford St)	NZTA/CCC	2021	2028	2021	Y	Y	Network Improvements	North
483	Traffic Signals Lowes/Dunns/Goulds/Spring Rolleston	SDC	2019	2028	2021	Y	Y	Close Goulds Road & Signalise Int	Selwyn
490	Shands/Blakes Rd Roundabout	SDC	2021	2028	2021	Y	Y	Roundabout	Selwyn
484	Traffic Signals at Rolleston Dr/Tennyson St	SDC	2021	2028	2021	Y	Y	Signalised Intersections	Selwyn
4005	Markham Way Traffic Calming	SDC	2022	2028	2021	Y	N	Traffic Calming	Selwyn
492	Springs/Marshs Rd Roundabout	SDC	2021	2028	2021	Y	Y	Roundabout	Selwyn
603	Weedons (Ross) / Jones and Levi intersections upgrades	SDC	2021	2021	2021	Y	Y	intersection	Selwyn
SDC_N-6	Traffic signals at Rolleston/Dryden	SDC	2028	2028	2021	Y	N	Signals	Selwyn
ther SH1 PBC (	Park'n Ride	SDC / WK / Ecan	2026	2021	2021	N	Y	Park'n Ride	Selwyn
602	SH1/Tennyson St/Brookside Rd Intersection Modifications	SDC/NZTA	2019	2028	2021	Y	Y	Intersections (Left in, Left Out)	Selwyn

CTMs v21 Network Schemes

ID	Scheme Name	RCA	Opening Date	Workshop Model Yr	Modelled Year	CAST	CTM	Type	Location
602	SH1/Tennyson St/Brookside Rd Intersection Upgrade	SDC/NZTA	2022	2028	2021	Y	Y	Intersections (Left in, Left Out)	Selwyn
3005	Townsend Rd - West Belt Link Road	WDC	2020	2021	2021	Y	Y	New Link	Waimakariri
WDC_N-C	SH1 & Woodend School (Ped Traffic Signal)	WDC	2021	2021	2021	Y	N	Traffic Signal	Waimakariri
WDC_N-D	Main Nth Rd & Tram Rd (Traffic Signal)	WDC	2021	2021	2021	Y	Y	Traffic Signal	Waimakariri
WDC_N-E	Flaxton Rd (upgraded collector)	WDC	2021	2021	2021	Y	N	Capacity improvement?	Waimakariri
WDC_N-H	Ivory Street, High to Buckham (Upgraded collector)	WDC	2020	2021	2021	Y	N	Capacity improvement?	Waimakariri
WDC_N-J	Flaxton Rd (upgraded collector)	WDC	2021	2021	2021	N	N		Waimakariri
46	Belfast Village Development Network (CN1 Applefields)	CCC	2019	2028	2028	Y	Y	Local Network	North
2222	Colombo Street (Bealey-Kilmore)	CCC	2020	2028	2028	Y	Y	AAC Improvements	CBD
725	HJR Extension	CCC	2023	2028	2028	Y	Y	Deviation	South-West
402	Intersection Improvement: Cashmere/ Hoon Hay/Worsleys	CCC	2022	2028	2028	Y	Y	Signalised Intersection	South
503	Marshland Rd/Hawkins Rd/Lower Styx Rd Signals	CCC	2023	2028	2028	Y	Y	Signalised Intersection	North-East
731	Orchard / Wairakei Priority Converted to Rbt	CCC	2028	2028	2028	Y	Y	Roundabout	West
999	High Street (Hereford-Manchester)	CCC	2022	2028	2028	Y	Y	AAC Improvements	CBD
999	High Street (Manchester-St Asaph)	CCC	2025	2028	2028	Y	Y	AAC Improvements	CBD
712	Main North/Marshland/Spencerville	CCC	2022	2028	2028	N	N	Signalised Intersection	North-East
2003	Route Improvement: Stanleys Road	CCC	2022	2028	2028	Y	N	Intersection Improvement	North-West
531	Grimseys Rd/Prestons Rd Signals	CCC	2026	2028	2028	Y	Y	Signalised Intersection	North
999	Lichfield Stg2	CCC	2023	2028	2028	Y	Y	AAC Improvements	CBD
26	Lincoln Road 4 Laning - Curletts Rd to Wrights Rd	CCC	2023	2028	2028	Y	Y	Widening	South-West
1111-E	New Brighton Improvements	CCC	2023	2028	2028	Y	N	Network Improvements	East
999	Tuam stg2	CCC	2023	2028	2028	Y	Y	AAC Improvements	CBD
51	Northwood Blvd/Johns/Groynes Intersection	CCC	2024	2028	2028	Y	Y	Signalised Intersection	North
526	Harewood Cycle Project - Nunweek Blvd to Highstead Rd	CCC	2026	2028	2028	Y	Y	Network Improvements	West
720	PC68 Local Road Network Changes	CCC	2024	2028	2028	Y	Y	Local Network	South-West
732	Pound / Ryans Priority Converted to Rbt	CCC	2024	2028	2028	Y	Y	Roundabout	West
4	Greers/Northcote/Sawyers Arms Signals	CCC	2027	2028	2028	Y	Y	Signalised Intersection	North
733	Hawkins / Prestons Signals	CCC	2028	2028	2028	Y	Y	Signalised Intersection	North
3	Northcote Road 4 Laning - Sawyers Arms Rd to Main North Rd	CCC	2031	2028	2028	Y	Y	Widening	North
530	Amyes/Springs Intersection	CCC	2027	2028	2028	Y	Y	Signalised Intersection	South-West
517	Awatea Rd/Springs Rd Signals	CCC	2027	2028	2028	Y	Y	Signalised Intersection	South-West
529	Burwood Rd/Mairehau Rd Signals	CCC	2024	2028	2028	Y	Y	Signalised Intersection	North
722	CB7 Spine Rd Option 5	CCC	2028	2028	2028	Y	Y	Local Network	South-West
741	Collector Rd Through CSW6 (Southerlands / Cashmere Rd area)	CCC	2028	2028	2028	Y	Y	Local Network	South-West
721	Milns / Sparks / Sutherlands Signalised Ts	CCC	2028	2028	2028	Y	Y	Signalised Intersection	South-West
187	Symes Rd Closure	CCC	2028	2028	2028	N	N	Road Stopping	South-West
186	Symes Rd Extension to Havard Ave	CCC	2028	2028	2028	N	N	Local Network	South-West
710	Highstead/ Sawyers Arms	CCC	2030	2028	2028	N	N	Signalised Intersection	North
723	CB7 Spine Rd Option 6 (incremental to Opt 5)	CCC	2028	2028	2028	Y	Y	Local Network	South-West
738	Collector Road Through CSW7	CCC	2024	2028	2028	Y	Y	Local Network	South-West
523	Highfield Park Development Network (CN5 & CN6)	CCC	2028	2028	2028	Y	Y	Local Network	North
407	New Links : Candys to Quaifes	CCC	2028	2028	2028	Y	Y	Deviation	South-West
734	Revised Belfast Area Plan Spine Rd (CB1)	CCC	2031	2028	2028	Y	Y	Local Network	North
716	Sparks / CAP Extension Signalised T	CCC	2031	2028	2028	Y	Y	Signalised Intersection	South-West
CCC_N-2	Prestons/Main North Improvement	CCC	2026	2028	2028	Y	Y	Priority Intersection	North
CCC_N-9	Lincoln Road PT priority - Whiteleigh to Wrights (also RLTP)	CCC	2025	2028	2028	Y	Y	Bus Lanes	West-Inner
CCC_N-15	Sockburn Roundabout & Lowther Intersection Improvement	CCC	2026	2028	2028	Y	Y	Signalise Lowther	West
CCC_N-16	Annex, Birmingham & Wrights Corridor Improvement	CCC	2023	2028	2028	N	N	Corridor Improvement	West
CCC_N-34	Clyde, Riccarton & Wharenui Intersection Improvements	CCC	2027	2028	2028	Y	Y	Signalised Intersection	West Inner
CCC_N-35	Dickeys & Main North Road Intersection Improvement	CCC	2028	2028	2028	Y	Y	Signalised Intersection	North
CCC_N-37	Disraeli, Harman & Selwyn Intersection Improvement	CCC	2028	2028	2028	Y	Y	Roundabout	South-Central
CCC_N-39	Moorhouse/Stewart Signals	CCC	2025	2028	2028	Y	N	Signalised Intersection	South-Central
CCC_N-40	Main North QEII & Pak'N Save Signals	CCC	2028	2028	2028	Y	Y	Signalised Intersection	North
523*	Highfield Commercial	CCC	2028	2028	2028	Y	Y	Local Network	North
CCC_N-41	Area behind Ara (St Asaph 1way) 30kph Fitz to Madras.	CCC	2028	2028	2028	Y	Y	Speed Change	Central
CCC_N-42	Riccarton/Ilam/Wharenui Intersection Improvement.	CCC	2022	2028	2028	Y	Y	Signalised Intersection	West Inner
CCC_N-43	Eastgate PT hub staged ped crossing and bus gate	CCC	2028	2028	2028	Y	N	Ped Signals	East
CCC_S-1	Safety - Harewood Road & Greers Road	CCC	2024		2028	Y	N	Signals safety change	North-West
CCC_S-2	Safety - Shirley Rd & Marshland Rd	CCC	2024		2028	Y	N	Signals safety change	North-East
CCC_S-3	Safety - Ferry Road & Aldwins Road	CCC	2024		2028	Y	N	Signals safety change	South-East
CCC_S-4	Safety - Moorhouse Avenue & Blenheim Road	CCC	2024		2028	Y	N	Signals safety change	Central
CCC_S-5	Safety - Selwyn Street & Moorhouse Avenue	CCC	2024		2028	Y	N	Signals safety change	Central
CCC_S-6	Safety - Moorhouse Avenue & Durham Street South	CCC	2024		2028	Y	N	Signals safety change	Central
CCC_S-7	Safety - Moorhouse Avenue & Manchester Street	CCC	2024		2028	Y	N	Signals safety change	Central
CCC_S-8	Safety - Gasson Street & Wordsworth Street	CCC	2024		2028	N	N	Signals safety change	South
CCC_S-9	Safety - Aldwins Rd - Ferry Rd to 100m N of Newcastle St	CCC	2024		2028	Y	Y	Speed reduction	East
CCC_S-10	Safety - Blenheim Rd Deans Ave to Main South Rd	CCC	2024		2028	Y	Y	Speed reduction	West
CCC_S-11	Safety - Bridge Street - SH74 to 310m E of SH74	CCC	2024		2028	Y	Y	Speed reduction	East
CCC_S-12	Safety - Buckleys Rd - Rhona St to McGregors Rd	CCC	2024		2028	Y	Y	Speed reduction	East
CCC_S-13	Safety - Ensors Rd - Opawa Rd to MacKenzie Ave	CCC	2024		2028	Y	Y	Speed reduction	East
CCC_S-14	Safety - Linwood Ave Jollie St to SH74	CCC	2024		2028	Y	Y	Speed reduction	East
CCC_S-15	Safety - Mills Rd Prestons Rd SNP	CCC	2024		2028	Y	Y	Speed reduction	North-East
CCC_S-16	Safety - Mt Pleasant Rd Summit Rd - UpperMajorHornbrook Rd	CCC	2024		2028	Y	Y	Speed reduction	South-East
CCC_S-17	Safety - Pound Rd Ryans Rd - Yaldhurst Rd SNP	CCC	2024		2028	Y	Y	Speed reduction	West

CTMs v21 Network Schemes

ID	Scheme Name	RCA	Opening Date	Workshop Model Yr	Modelled Year	CAST	CTM	Type	Location
CCC_S-18	Safety - Wigram Road - Platinum to Hayton	CCC	2024		2028	Y	Y	Speed reduction	South-West
CCC_N-38	Programme - Intersection Upgrade (Brougham & Moorhouse Area)	CCC/WK	2028	2028	2028	N	Y	?	South-Central
WK_N-1	NZUP -SH75 Halswell Rd Buslanes (Dunbars to Curletts)	NZTA	2025	2028	2028	Y	Y	Bus Lanes	South-West
WK_N-2	NZUP - SH76 Brougham Street Improvements	NZTA	2025	2028	2028	N	N	?	South-Central
4003	Wordsworth St Extension	SDC	2021	2028	2028	Y	N	Network Improvements	Selwyn
4001	Rolleston LURP Business NE Zone Network	SDC	2019	2028	2028	Y	Y	Network Improvements	Selwyn
4004	Markham Way Extension	SDC	2020	2028	2028	Y	N	Network Improvements	Selwyn
4006	Moore St Extension	SDC	2026	2028	2028	Y	N	Network Improvements	Selwyn
4007	Moore/Markham/Norman Kirk Intersection	SDC	2026	2028	2028	Y	N	Realignment	Selwyn
4008	Tennyson/Moore Roundabout	SDC	2026	2028	2028	Y	N	Roundabout	Selwyn
488	Shands/Hamptons Rd Roundabout	SDC	2022	2028	2028	Y	Y	Roundabout	Selwyn
487	Springs/Hamptons Rd Roundabout	SDC	2022	2028	2028	Y	Y	Roundabout	Selwyn
489	Shands/Trents Rd Roundabout	SDC	2022	2028	2028	Y	Y	Roundabout	Selwyn
4009	Traffic Signals Gerald St/West Belt	SDC	2027	2028	2028	Y	N	Signalised Intersection	Selwyn
4444	Gerald Street Upgrade (Eastern End)	SDC	2027	2028	2028	N	N	?	Selwyn
481	Lowes/Levi/Masefield Roundabout Upgrade	SDC	2024	2028	2028	Y	Y	Roundabout	Selwyn
493	Ellesmere Road Upgrade (Trices-Sabeys)	SDC	2025	2028	2028	Y	Y	Network Improvements	Selwyn
4010	Gerald Street/Vernon Drive Signals	SDC	2029	2028	2028	Y	N	Signalised Intersection	Selwyn
4444	Gerald Street Upgrade (Transitional Zone)	SDC	2029	2028	2028	N	N	?	Selwyn
4444	Gerald Street Upgrade (Western End)	SDC	2031	2028	2028	N	N	?	Selwyn
SDC_N-1	Springs/Tosswill	SDC	2026	2028	2028	Y	Y	Signals	Selwyn
SDC_N-2	Selwyn/Weedons Road	SDC	2027	2028	2028	Y	Y	Priority Intersection	Selwyn
SDC_N-3	Goulds/East Maddisons Road	SDC	2029	2028	2028	Y	Y	Roundabout	Selwyn
SDC_N-14	Springs Road Speed Reduction	SDC	2021	2021	2028	Y	Y	Speed Change	Selwyn
601	SH1 Flyover Rolleston Dr to Hoskyns Rd (remove signals)	SDC/NZTA	2023	2028	2028	Y	Y	Network Improvements	Selwyn
1004	SH1 Hoskyns Rd Slip Lane Izone Access	SDC/NZTA	2023	2028	2028	Y	Y	Slip Lane	Selwyn
1006	SH1/Rolleston Dr South Roundabout	SDC/NZTA	2038	2038	2028	Y	Y	Roundabout	Selwyn
1006	SH1/Rolleston Dr South Right Turn Prevention	SDC/NZTA	2041	2038	2028	Y	Y	Intersections (Left in, Left Out)	Selwyn
SDC_N-4	Burnham School/Dunns Crossing Road traffic signals	SDC/WK	2031	2028	2028	Y	N	Signals	Selwyn
SDC_N-5	Lowes/Dunns Crossing Road roundabout	SDC/WK	2031	2028	2028	Y	Y	Roundabout	Selwyn
SDC_N-7	Walkers/Two Chain Roundabout	SDC/WK	2028		2028	Y	N	Roundabout	Selwyn
SDC_N-8	Brookside/Burnham School Rd Roundabout	SDC/WK	?		2028	Y	N	Roundabout	Selwyn
SDC_N-9	Rolleston Dr/Brookside Roundabout	SDC/WK	2025		2028	Y	N	Roundabout	Selwyn
SDC_N-10	Rolleston Dr Sth/SH1 2L Roundabout	SDC/WK	?		2028	Y	Y	Roundabout	Selwyn
SDC_N-11	Dunns Crossing/Walkers/SH1 2L Roundabout	SDC/WK	?		2028	Y	Y	Roundabout	Selwyn
SDC_N-12	SH1/Burnham/Aylesbury 2L Roundabout	SDC/WK	?		2028	Y	Y	Roundabout	Selwyn
SDC_N-13	Weedons IC metering	SDC/WK	2028	2028	2028	N	N	Signalise Roundabout approach	Selwyn
3012	Spark Lane (Kippenberger to Northbrook) and Connections	WDC	2019	2028	2028	Y	N	New Link	Waimakariri
3006	Silverstream Blvd Extension to Adderley Terrace	WDC	2022	2028	2028	Y	Y	New Link	Waimakariri
3333	Skew Bridge alignment/replacement	WDC	2025	2028	2028	N	N	Bridge Upgrade	Waimakariri
3014	Connecting road between River and Lehmans Roads	WDC	2026	2028	2028	Y	N	New Link	Waimakariri
3333	Northern motorway congestion – park 'n' ride infrastructure (Rangiora, Kaiapoi)	WDC	2027	2028	2028	N	Y	PT	Waimakariri
3007	Boys / Harris / Rangiora Woodend / Tuahiwi Upgrade	WDC	2028	2028	2028	Y	Y	Roundabout	Waimakariri
3008	Boys / Gressons / Northbrook Roads Speed Reduction	WDC	2028	2028	2028	Y	Y	Speed Change	Waimakariri
3009	Rangiora Woodend Road Speed Reduction	WDC	2028	2028	2028	Y	Y	Speed Change	Waimakariri
454	Ravenswood Spine Road	WDC	2021	2028	2028	Y	Y	New Link	Waimakariri
3010	Smith St Signals East of Tunas Street	WDC	2028	2028	2028	Y	N	Signalised Intersection	Waimakariri
3011	Pegasus Road connecting to Gladstone Road	WDC	2031	2028	2028	Y	Y	New Link	Waimakariri
3013	Tuahiwi Rd Speed Reduction	WDC	2028	2028	2028	Y	Y	Speed Change	Waimakariri
3333k	Bradleys / McHughs / Tram	WDC	2025	2028	2028	N	N	New roundabout	Waimakariri
WDC_N-A	Fernside Rd & Flaxton Rd (Roundabout)	WDC	2021	2021	2028	Y	Y	Roundabout	Waimakariri
WDC_N-1	Rangiora-Woodend Rd & SH1 (NZTA)	WDC	2023	2028	2028	Y	Y	Left in/left out only	Waimakariri
WDC_N-3	Southbrook Rd & Torlesse St & Coronation St	WDC	2023	2028	2028	Y	N	New traffic signal	Waimakariri
WDC_N-4	Fernside Rd Level Crossing	WDC	2026	2028	2028	N	N	Railway crossing closure	Waimakariri
WDC_N-5	Mulcocks Rd Level Crossing	WDC	2026	2028	2028	N	N	Railway crossing closure	Waimakariri
WDC_N-10	Kippenberger Ave & MacPhail Ave	WDC	2025	2028	2028	Y	Y	New roundabout	Waimakariri
WDC_N-11	SH1 & Williams St (NZTA) (Pineacres Int Upgrade)	WDC	2023	2028	2028	Y	Y	New roundabout	Waimakariri
WDC_N-12	SH1 & Woodend Beach Rd (NZTA)	WDC	2023	2028	2028	Y	Y	New roundabout	Waimakariri
WDC_N-13	SH1 & Woodend Rd (NZTA)	WDC	2023	2028	2028	Y	Y	New traffic signal	Waimakariri
WDC_N-14	Oxford Rd & Lehmans Rd	WDC	2027	2028	2028	Y	Y	New roundabout	Waimakariri
WDC_N-16	Ohoka Rd & Island Rd	WDC	2023	2028	2028	Y	Y	New roundabout	Waimakariri
WDC_N-17	Oxford Rd & Charles Upham Dr	WDC	2025	2028	2028	Y	Y	New roundabout	Waimakariri
WDC_N-18	Todds Rd & Fernside Rd	WDC	2024	2028	2028	Y	N	New right turn bay	Waimakariri
WDC_N-19	Charles Upham Dr, Valour Dr to Huntingdon	WDC	2022	2028	2028	Y	N	New collector	Waimakariri
WDC_N-24	Fernside Rd & Townsend Rd	WDC	2028	2028	2028	Y	Y	New roundabout	Waimakariri
WDC_N-26	Lehmans Rd & Fernside Rd	WDC	2029	2028	2028	Y	N	Intersection realignment	Waimakariri
WDC_N-29	Tram Road Interchage Western Signals	WDC	2021	2028	2028	Y	Y	new traffic signals	Waimakariri
485	Traffic Signals Springs/Gerald/Ellesmere Junction Rd	SDC	2031	2031	2031	Y	Y	Signalised Intersection	Selwyn
504	Belfast Rd/Marshland Rd Signals	CCC	2031	2038	2038	Y	Y	Signalised Intersection	North-East
999	Salisbury Street and Kilmore Street	CCC	2031	2038	2038	Y	Y	AAC Improvements	CBD
999	Gloucester Street (Madras-Manchester)	CCC	2030	2038	2038	Y	Y	AAC Improvements	CBD
406	NWRA Area 2 Collector Road	CCC	2031	2038	2038	Y	Y	Network Improvements	West
22	Ferry Rd 4 Laning - Aldwins Rd to Fitzgerald Ave	CCC	2038	2038	2038	Y	Y	Widening	East
726	Shands Rd 4-laning CSM2 - HJR	CCC	2031	2038	2038	N	N	Network Improvements	West

CTMs v21 Network Schemes

ID	Scheme Name	RCA	Opening Date	Workshop Model Yr	Modelled Year	CAST	CTM	Type	Location
704	Wairakei/Woolridge	CCC	2036	2038	2038	N	N	Signalised Intersection	West
516	Cashmere Rd/Centaurus Ave/Colombo St/Dyers Pass Signals	CCC	2039	2038	2038	N	N	Signalised Intersection	South
CCC_N-3	Cathedral Square Improvements	CCC	2031	2038	2038	Y	N	Network Improvements	Central
CCC_N-23	Cranford Street Intersection Improvement	CCC	2026	2038	2038	N	N	?	North
CCC_N-26	Cranford Street New Signalised Intersection	CCC	2029	2038	2038	N	N	?	North
CCC_N-30	Hawkins & Radcliffe Intersection Improvement	CCC	2031	2038	2038	Y	N	Signalised Intersection	North
CCC_N-31	Main North Road Corridor Improvement	CCC	2031	2038	2038	N	N	?	North
486	Gerald/James/Edward St Roundabout	SDC	2031	2031	2038	Y	Y	Roundabout	Selwyn
3012	New eastern arterial in Rangiora	WDC	2036	2038	2038	Y	Y	New Link	Waimakariri
WDC_N-2	NE Rangiora N-S Collector (MacgPhail / Kippenberger to Coldstream)	WDC	2035	2038	2038	Y	Y	New collector	Waimakariri
WDC_N-8	Blackett St-Keir St Collector	WDC	2031	2038	2038	Y	N	New collector	Waimakariri
WDC_N-9	Blackett St & Ashley St	WDC	2032	2038	2038	Y	Y	Traffic Signal	Waimakariri
WDC_N-25	Lehmans Rd & Johns Rd	WDC	2030	2038	2038	Y	N	New roundabout	Waimakariri
WDC_N-27	Fernside Rd & Easterbrook Rd	WDC	2032	2038	2038	Y	N	New right turn bay	Waimakariri
WDC_N-28	Tram Rd & Whites Rd	WDC	2031	2038	2038	N	N	New left turn bays	Waimakariri
453	Woodend Bypass	WK	2041	2048	2048	Y	Y	Network Improvement	Waimakariri

Appendix C Option Evaluation

C.1 Early Assessment Sifting Tool

C.2 Long List Multi-Criteria Assessment

Early Assessment Sifting Tool - Rangiora Eastern Link

Early Assessment Sifting Tool: Excel template

The Early Assessment Sifting Tool (EAST) supports an initial coarse screening of alternatives and options. The EAST is designed to quickly and robustly rule out alternatives and options, allowing for a more manageable subsequent multi-criteria analysis exercise.

Project overview

Date:	19/12/2024	**Business case**	Single stage business case	**Do-minimum:**	Current scope of Long Term Plan projects
Project name:	Rangiora Eastern Link	**Problem/oppo**	Enabling free movement of goods and people in South and East Rangiora		

Investment objective:	Reduce congestion along Southbrook Road and improve travel time reliability
Investment objective:	Provide transport connections to enable development of 5,000 lots in East Rangiora
Investment objective:	Improve safety of network to IRR rating of medium or better

Note: Please copy the row above to add an additional investment objective.

Alternative or option details			Investment objective			Practical feasibility			Scheduling/ programming	Cost	Key risks and uncertainties	Impacts on te ao Māori	Environmental and social responsibility		Fatal flaws	Other impacts	Summary of decision made
Intervention types sourced from the intervention hierarchy	Unique identifier	Name of alternative/option	Congestion & Travel Time	Enabling Growth	Safety	Technical	Safety and design	Consentability					Identify	Mitigation Can these be avoided, remedied or mitigated?			Summary of decision made
Integrated planning	1	Change development pattern to align with existing network	1. Low	3	1. Low	5. Red (difficult/complex)	1. Green	5. Red (difficult/complex)	5+ years	$5-$50 million	Partially achieved. Ten years to next PDP	Note Greater ChCh partnership agreements	Urban form forced by existing network	User to describe...	Decisions already made. Mostly supports existing corridors now	User to describe...	Discontinue
Manage demand	2	Time of Use Charging	3	1. Low	2	5. Red (difficult/complex)	2.Amber/green	3.Amber	5+ years	$5-$50 million	Social licence and implementation	unknown	Impact on low income travellers	Alternative longer route	New technology in s small town appears inappropriate	User to describe...	Progress
Manage demand	3	Congestion Charging	3	1. Low	2	5. Red (difficult/complex)	2.Amber/green	4.Red/amber	5+ years	$5-$50 million	Social licence and implementation	unknown	Impact on low income travellers	Alternative longer route	New technology in s small town appears inappropriate	User to describe...	Discontinue
Best use of the existing system	4	Tidal laning (2+1)	3	3	1. Low	3.Amber	4.Red/amber	3.Amber	2-5 years	$5-$50 million	Social licence and implementation	unknown	Nil material			User to describe...	Progress
Best use of the existing system	5	Four lane Southbrook Rd within existing road reserve	5. High	3	2	1. Green	4.Red/amber	2.Amber/green	2-5 years	$5-$50 million	Community adverse response	unknown	Nil material			User to describe...	Progress
Best use of the existing system	6	Increase PT frequency	2	2	1. Low	1. Green	1. Green	1. Green	5+ years	$1-$5 million	Funding	unknown	Nil material		Unlikely to be effective in changing patterns	User to describe...	Discontinue
Best use of the existing system	7	Upgrade western route	1. Low	1. Low	1. Low	1. Green	2.Amber/green	1. Green	2-5 years	$5-$50 million	Limited risk	unknown	Nil material		Does not meet objective for East Rangiora growth	User to describe...	Discontinue
New infrastructure	8	Construct REL Sbk to Northbrook (West of WWTP)	5. High	5. High	4	2.Amber/green	1. Green	2.Amber/green	2-5 years	$5-$50 million	Normal risk profile. Land acquisition	High value water resources	Waterways	Good design and restoration		User to describe...	Progress
New infrastructure	9	Construct REL Sbk to Northbrook (East of WWTP)	5. High	5. High	4	2.Amber/green	1. Green	2.Amber/green	2-5 years	$5-$50 million	Normal risk profile. Land acquisition	High value water resources	Waterways	Good design and restoration		User to describe...	Progress
New infrastructure	10	Construct REL Lineside to Northbrook	5. High	5. High	4	2.Amber/green	1. Green	2.Amber/green	2-5 years	$5-$50 million	Normal risk profile. Land acquisition	High value water resources	Waterways	Good design and restoration		User to describe...	Progress
New infrastructure	11	Park and Ride upgrade	1. Low	1. Low	1. Low	2.Amber/green	1. Green	2.Amber/green	2-5 years	$1-$5 million	Effectiveness	Unknown	Nil material		Unlikely to be effective in changing patterns	User to describe...	Discontinue
New infrastructure	12	Mass rapid transit	2	2	1. Low	5. Red (difficult/complex)	4.Red/amber	3.Amber	5+ years	$50+ million	Funding and delivery	Unknown	Unknown		Unlikely to be effective in changing patterns sufficiently	User to describe...	Discontinue
New infrastructure	13	New western bypass	2	1. Low	1. Low	1. Green	2.Amber/green	2.Amber/green	5+ years	$50+ million	Landowner and funding	High value water resources	Waterways	Good design and restoration	Does not meet objective for East Rangiora growth	User to describe...	Discontinue
New infrastructure	14	New eastern bypass - Fernside to Coldtream Rd	4	5. High	4	1. Green	1. Green	2.Amber/green	5+ years	$5-$50 million	Landowner and funding	High value water resources	Waterways	Good design and restoration		User to describe...	Progress
New infrastructure	15	Widen and four lane Southbrook Rd	5. High	5. High	4	1. Green	4.Red/amber	3.Amber	5+ years	$5-$50 million	Community adverse response	unknown	Private impact	Purpose of built and improved private land		User to describe...	Progress

Criteria		Likely Investment Objectives						Critical success factors								Opportunities and Impacts					
Options		Unlocks land for housing		Reduces travel times		Improves safety		Affordability		Risk to delivery		Value for money		Resilience		Environment and Cultural		Social and Landscape		People & Property	
DM	Do Minimum	0						0													
Southbrook Road																					
A.1	Southbrook Four laning – within existing road reserve	1	no additional routes but provides additional capacity	1	additional capacity will assist travel time improvements but also likely to induce traffic	-3	additional traffic volumes and removal of parking and cycle facilities. Southbrook road options put more traffic across level crossings	-1	$21.5 M	-2	community and stakeholder engagement a risk to programme	1	Lower cost but limited benefits	1	provides additional road width	0		-2	Impact on schools and accesibility of social destinations	-3	Impact from widening - loss of parking
A.2	Southbrook Four laning – within wider road reserve	1		1		-1	Additional traffic volumes. Southbrook road options put more traffic across level crossings	-2	$38.9 M	-3	community and stakeholder engagement and property acquisition a risk to programme	1	Lower cost but limited benefits	1	provides additional road width	0		-2		-3	Impact from widening - land take
A.3	Southbrook three laning – tidal flow 2+1 within existing road reserve	1		1		-3	additional traffic volumes and removal of parking and cycle facilities. Southbrook road options put more traffic across level crossings. Would require removal of many right turn bays. 30% additional crashes forecast	-1	Not calculated but very expensice due to installation of gantrys and other warning/information systems plus movable median barrier	-3	community and stakeholder engagement a risk to programme. Technically difficult to implement with number of intersections	1	Lower cost but limited benefits	1	provides additional road width	0		-2		-2	less impact than 4 laning
A.4	Congestion charging / Time of Use	0		1	reduction in vehicle volumes will improve travel times	-1	assumes same cross section as existing. Southbrook road options put more traffic across level crossings	-2	high implementation costs and ongoing operational cost	-3	Untested and not done previously in a town of similar size	-3	unlikely to sustain operational costs	0		0		-3	Social impact of costs	-1	infrastructure needed to support
Eastern Alignments																					
B.1	Eastern Link - west route	3	bisects future development area	3	provides an additional route	3	SUP and arterial. New rail crossing at Lineside Road	-2	$34.9M	3	alignment is on designation	3	short routes and closest to both existing residential and future growth	3	additional route provided	-2	Springs and waterways in area. Mana whenua concern on impacts	0	Limited impact (minor impact so not positive score)	-1	Some noise issues at Northbrook Rd
B.2.1	Eastern Link – east route to WWTP roundabout	3	bisects future development area	3	provides an additional route	3		-2	$35.7M	2	largely on designation	3		3		-2		0	Overlap east of WWTP with silent file area SF011 at Tuahiwi	-1	similar to existing designation
B.2.2	Eastern Link – east route to Lineside Rd	3	bisects future development area	3	provides an additional route	1	SUP and arterial but with existing rail crossing at Lineside Road	-2	$32.9M	-1	largely on designation	2	doesn't get upgraded level crossing (safety) and cycle connection	3		-2		0	Overlap east of WWTP with silent file area SF011 at Tuahiwi. Diverts traffic further from local social and employment destinations leading to degraded community connection	-2	more property impact than designation
B.2.3	Eastern Link – east route to Fernside/Youngs	3	bisects future development area	2	additional route but longer distance travelling to south end of Rangiora	3	SUP and arterial but with existing rail crossing at Lineside Road. New level crossing at Fernside	-2	$40.9M	-2	route at southern end is untested (engagement, technical feasibility)	1	longer route than similar variants	3		-3	more greenfield area than alternates	-3		-2	more property impact than designation
C	Eastern Bypass	2	on edge of infrastructure boundary	2	additional route but longer distance travelling to south end of Rangiora. Query on traffic volumes using road	2	SUP and arterial but with existing rail crossing at Lineside Road. New level crossing at Fernside. Query on traffic volumes using road	-2	$44.6M	-3	untested route (engagement, technical feasibility)	-1	longest route and furthest to both existing residential and future growth. WDC likely to own more of Lineside Road in this option	3		-3	additional impact on Cam River	-3		-3	significant property impact and away from designation

Appendix D Economic Analysis

Memo

To:	Waimakariri District Council	From:	Steven Jiang and Dhimantha Ranatunga Stantec NZ
Project/File:	310206347	Date:	07 March 2025

Reference: Rangiora Eastern Link - Economics Memorandum

Purpose

The purpose of this memo is to summarise the economic analysis undertaken for the Rangiora Eastern Link (REL) assessment, aligning with the guidelines and procedures outlined in the Monetised Benefits and Cost Manual (MBCM, November 2024) and the Crash Estimation Compendium (CEC).

This memo should be read in conjunction with the Rangiora Eastern Link Transportation Assessment of Options[1] (Transport Assessment).

It is important to note that this is only an initial evaluation, and the final BCR would be subject to change based on more detailed and robust inputs for each option (e.g., scheme level designs and detailed cost estimates).

Do-Minimum

The Do-Minimum is comprised of projects that are already committed and known development areas. The Do-Minimum road network and land use assumptions and model outputs are detailed in Section 5 of the Transport Assessment.

Options

A initial transport assessment for REL was conducted in 2021[2] for the route designation which identified the benefits of the REL project being increased capacity, reduced travel times and improved consistency of travel times.

Further long list options assessment undertaken as part of the 2025 Transport Assessment, refer Figure 1 below, has led to the following short-listed options for economic analysis:

- Option A1: Southbrook 4-laning
- Option B1a: REL – West Alignment
- Option B2.1: REL – East Alignment
- Option B2.2: REL – Connection to Lineside Road

[1] Rangiora Eastern Link Transportation Assessment of Options (Stantec, 2025)
[2] Rangiora Eastern Road Connection: Technical Assessment – Transportation (WSP, 2021)

Reference: **Rangiora Eastern Link (REL) - Economics Memorandum**

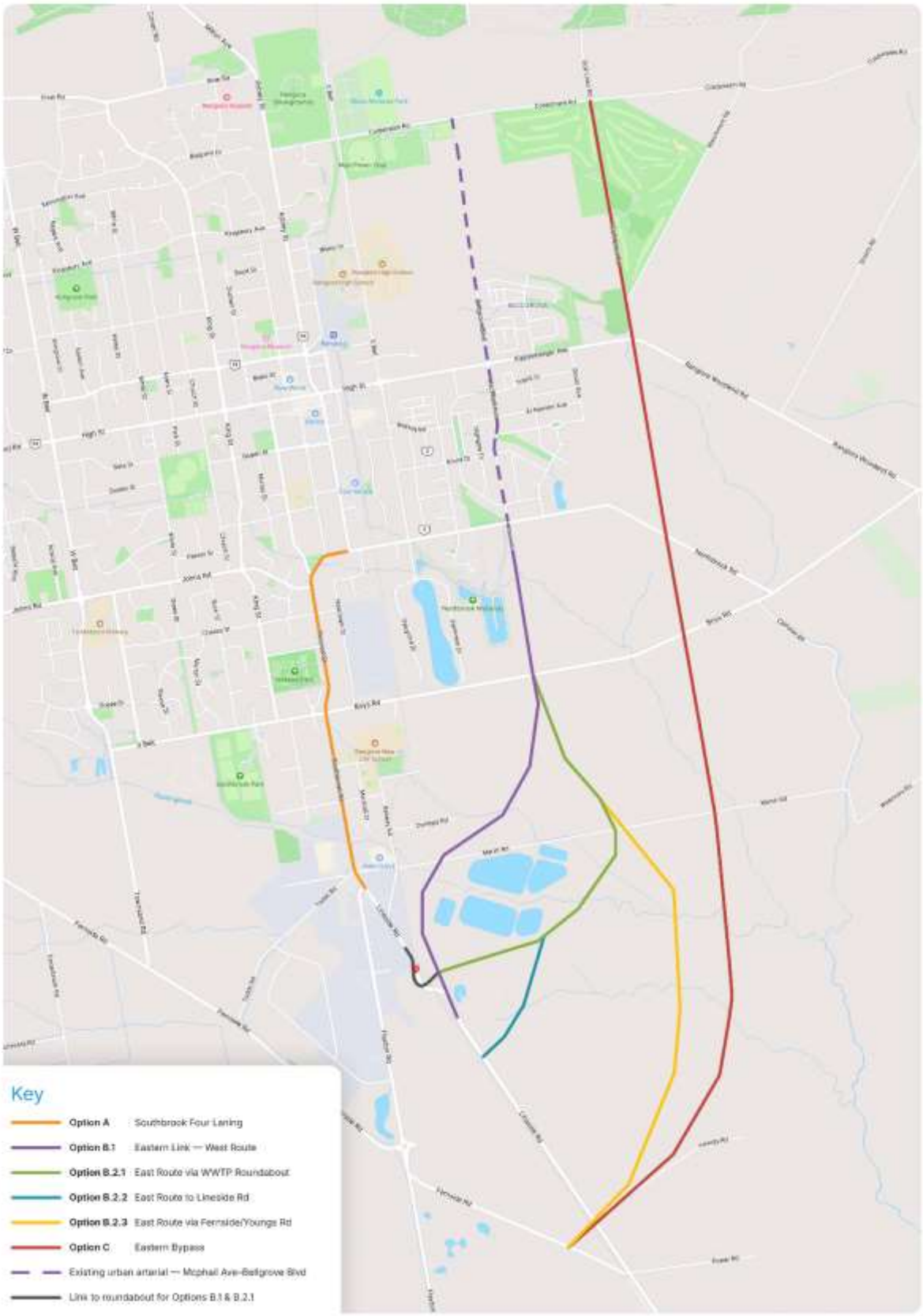


Figure 1. Infrastructure long list options for Rangiora Eastern Link

Inputs and Assumptions

The key inputs assumptions are summarised in **Error! Reference source not found.**.

Table 1. Summary of Inputs and Assumptions

Summary of Assumptions	
Element	Assumption
Analysis Period and Discount Rates	• 60-year analysis period with a variable 2% discount rate for the first 30 years and 1.5% discount rate from year 31 onwards. Sensitivity testing has also been undertaken for a shorter 40-year analysis period and different discount rates.
Timing	• Pre-implementation phases has been estimated to be spread over 24 months – this includes the property phase from 2026-2027 • Construction duration has been estimated at 24 months from 2028 to 2029. • Benefits realisation is expected to occur from 2030 onwards.
Traffic and Modelling Inputs	• The traffic volumes and forecasts have been sourced from the CAST model for year 2028, 2038 and 2048. • All benefits have been capped / flat-lined post the 2048 future year. • Annualisation factors have been based on CAST values, with 245 weekdays and 120 weekends/holidays.
Travel Time Costs (TTC) and Vehicle Operating Costs (VOC)	• TTC and VOC costs have been calculated based on CAST network statistics on vehicle kilometres travelled (VKT) and vehicle hours travelled (VHT). • Travel time costs have been adopted for Urban Arterial values of time for the AM, IP, PM and weekend. Congested value of time has been applied to the modelled vehicle delayed hours for the AM and PM peaks at 50% of the maximum CRV. • Vehicle operating costs adopted the Urban Arterial base running costs based on the modelled VKT and network average speed, by peak period.
Safety	• Based on CAST model outputs, slight reductions in network VKT are expected for most options. • As road safety is a function of exposure – the less VKT, the lower the expected crashes and improved safety outcomes. • A neutral safety benefit has been adopted as the impacts are spread widely across the Rangiora network. A detailed network safety model could be developed as part of the next phase.
Active Modes	• SP11 has been used to estimate the active mode benefits. • WDC estimates from the Passchendaele cycle route nearby have been used to inform the REL expected uplift. • The SP11 new and existing cyclist estimates have been heavily reduced due to existing count information and expected uplift. • A cycling growth rate of 1.3% per annum has been adopted based on forecast population growth from the CTM model
Other Benefits	• Resilience benefits have not been assessed, however due to the abundance of local roads within the vicinity, resilience benefits are likely to be minimal as alternate route distances are low. • Amenity benefits have not been assessed and could be explored in the next phases of investigation (e.g. amenity benefits from lower traffic volumes through sections of Rangiora) • Emissions benefits have not been assessed and could be explored in the next phases of investigation (e.g. emissions benefits from VKT reduction).
Costs – Do Minimum	• No costs associated with the Do-Minimum

Reference: **Rangiora Eastern Link (REL) - Economics Memorandum**

Summary of Assumptions	
Element	Assumption

Costs – Option A1	• Rough Order Cost (ROC) estimates have been provided by WDC for the base, expected and 95th tile. The expected estimates are as follows:
	• Capital Costs
	  ○ Property purchase in Year 1 with costs of $0 as works are within the existing Southbrook Road corridor
	  ○ Pre-implementation in Year 1 and Year 2 with costs of $1.9M spread evenly over both years
	  ○ Construction costs occur over a 24-month period from Year 3-4 with costs of $19.5M spread evenly across both years.
	  ○ Assumed developer contributions of 25%
	• Maintenance Costs
	  ○ Annual maintenance costs, covering both periodic and on-going maintenance, has been estimated as 0.5% of the total capital costs, this equates to $0.1M p.a.

Costs – Option B1a	• Rough Order Cost (ROC) estimates have been provided by WDC for the base, expected and 95th tile. The expected estimates are as follows:
	• Capital Costs
	  ○ Property purchase in Year 1 with costs of $4.6M
	  ○ Pre-implementation in Year 1 and Year 2 with costs of $2.8M spread evenly over both years
	  ○ Construction costs occur over a 24-month period from Year 3-4 with costs of $27.6M spread evenly across both years.
	  ○ Assumed developer contributions of 50%
	• Maintenance Costs
	  ○ Annual maintenance costs, covering both periodic and on-going maintenance, has been estimated as 0.5% of the total capital costs, this equates to $0.2M

Costs – Option B2.1	• Rough Order Cost (ROC) estimates have been provided by WDC for the base, expected and 95th tile. The expected estimates are as follows:
	• Capital Costs
	  ○ Property purchase in Year 1 with costs of $4.5M
	  ○ Pre-implementation in Year 1 and Year 2 with costs of $2.8M spread evenly over both years
	  ○ Construction costs occur over a 24-month period from Year 3-4 with costs of $28.4M spread evenly across both years.
	  ○ Assumed developer contributions of 50%
	• Maintenance Costs
	  ○ Annual maintenance costs, covering both periodic and on-going maintenance, has been estimated as 0.5% of the total capital costs, this equates to $0.2M

Costs – Option B2.2	• Rough Order Cost (ROC) estimates have been provided by WDC for the base, expected and 95th tile. The expected estimates are as follows:
	• Capital Costs
	  ○ Property purchase in Year 1 with costs of $4.0M
	  ○ Pre-implementation in Year 1 and Year 2 with costs of $2.6M spread evenly over both years
	  ○ Construction costs occur over a 24-month period from Year 3-4 with costs of $26.3M spread evenly across both years.
	  ○ Assumed developer contributions of 50%
	• Maintenance Costs
	  ○ Annual maintenance costs, covering both periodic and on-going maintenance, has been estimated as 0.5% of the total capital costs, this equates to $0.2M

Benefit Cost Ratio

A breakdown of the 60-year present value (PV) benefits and overall benefit cost ratio is provided in Table 2, with further discussion provided in the sections below. Note that Option B2.1 and Option B2.2 modelling results are under review and will be included in the next revision of this memo.

Table 2. Breakdown of Costs and Benefits

Component	Option A (4-laning)	Option B1a (REL West)	Option B2.1 (REL East)	Option B2.2 (Lineside Rd)
TT Savings	$26.5	$227.7		
VOC Savings	$39.9	$50.7		
Active Modes	$3.8	$3.7		
Safety	-	-		
Total PV Benefits	$70.2	$282.0		
Total PV Costs	$35.6	$58.2		
Developer Contribution	$7.5	$24.7		
BCR (National)	2.0	4.8		
BCR (Government)	2.2	7.7		
First Year Rate of Return (FYRR)	6%	5%		

The results show:

- The TTC benefits vary significantly between Option A and the remaining options:
  - » As Option A includes 4-laning an existing road corridor, the travel time benefits are significantly lower at $27M compared to over $200M benefits of the remaining options. This is because the Option A fails to provide sufficient capacity in the 2048 model year, leading to travel time disbenefits.
  - » Option B1a provides the highest TTC benefits at $228M as this option provides additional connectivity between Lineside Road and the eastern side of Rangiora.
- The VOC benefits demonstrate a small level of variability between all options, with Option A providing the lowest benefit due to capacity issues in the long term.
- The active modes benefit between all options assessed were relatively similar, at approximately $4M, due to there being a limited expected uptake of new cyclists within the network and similarities between options with respect to cycling provision.
- A safety benefit analysis was undertaken which demonstrated disbenefits within the network. The extent of the network used for safety benefits was too small to consider the wide range of traffic reassignment benefits from shifting travel from rural roads to new, safer urban roads. Based on CAST model outputs, slight reductions in network VKT are expected for most options which would reduce crash risk. Therefore a neutral safety benefit has been adopted as the impacts are expected to be low.
- Option B1a has the highest National BCR (BCRn) at 4.8 while Option A has a BCR of 2.0, reflecting the higher travel time and vehicle operating benefits of Option B1a.
- An incremental analysis was undertaken and demonstrated that the incremental benefits of Option B1a offset the higher costs when compared to Option A, with an incremental BCR of 15.

- Considering developer contributions, the Government BCRs (BCRg) increase, with Option B1a increasing to 7.7. Option A sees the smallest increase in BCR as the developer contributions are only 25% compared to the 50% applied to Option B1a.
- All options demonstrated a similar level of First Year Rate of Return (FYRR) with Option B1a showing the lowest at 5%. As discussed previously, Option B1a performs better in the longer term, resulting in a higher BCR but lower FYRR.

Sensitivity Testing

The following sensitivity tests have been applied to Option B1a and subsequent BCRs are summarised in Table 3 and Table 4 below.

Table 3: Sensitivity Testing Scenarios

Summary of Sensitivity Testing Scenarios			
Sensitivity	**Low**	**Base**	**High**
Analysis Period	40 year	60 year	-
Discount Rate	8%	2% / 1.5%	1.5%
Cost Estimate (Risk Adjustment)[3]	1.5x WDC P95	1.5x WDC P50	1.5x WDC Base
Rough Order Cost (WDC)	WDC P95	WDC P50	WDC Base
Maintenance (% Capital Costs)	0.25%	0.5%	0.75%
SP11 Uptake (Active Modes)	5% SP11	10% SP11	15% SP11
Cyclist Hazardous Benefit	-	Exclude	Include
Congested Time (CRV)	0% CRV	25% CRV AM and PM Peak, 10% CRV IP	100% CRV

Table 4. Sensitivity Testing BCRs

Summary of Sensitivity Testing BCRs - Option B1a				
Sensitivity	**Cost Estimate**	**Low**	**Base**	**High**
Analysis Period	Risk Adjusted Cost Estimate	3.3	4.8	-
Discount Rate		1.3		5.0
Cost Estimate (Risk Adjustment)		4.0		6.3
Maintenance (% Capital Costs)		4.5		5.2
SP11 Uptake (Active Modes)		4.8		4.9
Cyclist Hazardous Benefit		-		4.9
Congested Time (CRV)		4.3		6.0
Rough Order Cost (WDC)		6.1	7.3	9.4

[3] The risk adjusted cost estimates allow a further 50% contingency over the WDC Rough Order Costs to account for the preliminary phase of investigation.

The sensitivity testing has showed:

- The BCR is most sensitive to the analysis period, discount rate, cost estimates and congested time values and ranges from 1.3 (8% discount rate) to 9.4 (WDC ROC Base Estimate).
- The sensitivity testing shows that the BCR remains above 1.0 under a range of scenarios demonstrating the project provides value for money.
- Particularly for Option B1a, a significant portion of TTC and VOC benefits occur beyond the 2048 model year, indicating the increased effectiveness of the option in the longer term. This is reflected in the sensitivity testing as the BCR increased from 3.3 to 4.8 with a 40-year to 60-year analysis period comparison.
- The NZTA guidance recommends applying an 8% discount rate as a sensitivity test, which the results have shown a significant decrease in the BCR from 4.8 to 1.3. Testing against a 1.5% discount rate has shown minor differences in the BCR. This demonstrates that the BCR is highly dependent on the strategic-level inputs from NZTA.
- Rough Order Cost (ROC) estimates have been provided by WDC. It is acknowledged that there are typically significant uncertainties regarding cost estimates particularly during the planning and investigation phases of projects. Applying the WDC ROC estimates, the BCR ranges from 6.1 – 9.4. A conservative risk adjustment of 1.5 times the WDC estimates have been applied, which results in a lower BCR range of 4.0 (P95) – 6.3 (Base). Whilst this adjustment increases the costs, the BCRs are still well above 1.0.
- The CAST model has provided vehicle hour network travel times, including the proportion of travel times which are comprised of delayed time. It is difficult to determine what proportion of this delayed time is associated with congestion, for which this sensitivity test has been undertaken. The BCRs range from 4.3 – 6.0 and demonstrate that depending on the assumed level of congestion, there are significant changes to the BCR, especially since the TTC benefits comprise most of the observed benefits.

Summary

This memo provides a summary of the economic analysis undertaken for the REL assessment, aligning with the guidelines and procedures outlined in the MBCM and the CEC. Table 5 provides a summary of the benefits streams, BCR (National), BCR (Government) and FYRR for each of the options assessed.

Table 5. Options BCR summary

Component	Option A (4-laning)	Option B1a (REL West)	Option B2.1 (REL East)	Option B2.2 (Lineside Rd)
TT Savings	$26.5	$227.7		
VOC Savings	$39.9	$50.7		
Active Modes	$3.8	$3.7		
Safety	-	-		
Total PV Benefits	$70.2	$282.0		
Total PV Costs	$35.6	$58.2		
Developer Contribution PV Costs	$7.5	$24.7		
BCR (National)	2.0	4.8		
BCR (Government)	2.2	7.7		
FYRR	6%	5%		

Key findings include:

- Travel time benefits for the options are significant and account for 40-80% of the total benefits, followed by vehicle operating costs. Active mode benefits are minor and account for less than 5% of the total benefits.
- As Option A includes 4-laning an existing road corridor, the travel time benefits are significantly lower at $27M compared to over $200M benefits for Option B1a. This is because the Option A fails to provide sufficient capacity in the 2048 model year, leading to travel time disbenefits.
- Option B1a has the highest National BCR (BCRn) at 4.8 while Option A has a BCR of 2.0, reflecting the higher travel time and vehicle operating benefits of Option B1a.
- Incremental analysis demonstrates that the incremental benefits of Option B1a offset the higher costs of this option when compared to Option A, with an incremental BCR of 15.
- Considering developer contributions, the Government BCRs (BCRg) increase, with Option B1a increasing to 7.7. Option A sees the smallest increase in BCR as the developer contributions are only 25% compared to the 50% applied to Option B1a.

The sensitivity testing shows that the BCR remains above 1.0 under a range of scenarios demonstrating the project provides value for money. The BCR is most sensitive to the analysis period, discount rate, cost estimates and congested time values and ranges from 1.3 (8% discount rate) to 9.4 (WDC ROC Base Estimate).

Appendix E Additional Model Outputs

AM Peak LOS Intersection	Approach	2028 Do Minimum Veh	Delay	LOS	2028 Option A Veh	Delay	LOS	2028 Option B.1a Veh	Delay	LOS
Ashley Street / Coldstream Road	North	460	2	A	572	2	A	537	2	A
	South	225	7	A	278	8	A	239	7	A
	East	171	11	B	122	13	B	158	11	B
	Intersection	857	11	B	972	13	B	933	11	B
Ashley Street / High Street	North	573	25	C	659	29	C	559	24	C
	South	382	23	C	474	27	C	378	23	C
	East	221	31	C	241	31	C	221	30	C
	West	157	23	C	169	24	C	153	23	C
	Intersection	1,333	25	C	1,543	28	C	1,311	25	C
Ivory Street / Northbrook Road	North	476	2	A	608	11	B	428	2	A
	East	259	23	C	281	33	C	215	16	C
	West	574	10	A	640	9	A	514	8	A
	Intersection	1,309	23	C	1,528	14	B	1,158	16	C
Percival Street / Victoria Street	North	31	38	E	57	46	E	46	29	D
	South	822	3	A	912	1	A	750	2	A
	East	681	11	B	903	12	B	586	10	A
	Intersection	1,535	38	E	1,872	46	E	1,383	29	D
Percival Street / Johns Road	North	708	13	B	956	15	B	627	12	B
	South	780	2	A	909	1	A	698	2	A
	West	170	42	E	132	52	F	201	37	E
	Intersection	1,657	42	E	1,997	52	F	1,527	37	E
Percival Street / Charles Street	North	676	12	B	963	13	B	625	10	A
	South	663	9	A	805	17	C	582	8	A
	East	91	36	E	76	56	F	77	25	C
	West	75	27	D	82	35	D	74	23	C
	Intersection	1,505	36	E	1,927	56	F	1,359	25	C
Southbrook Road / South Belt / Percival Street / Boys Road	North	552	66	E	863	25	C	511	38	D
	South	719	44	D	820	16	B	679	28	C
	East	258	46	D	226	33	C	151	33	C
	West	517	27	C	496	20	B	478	19	B
	Intersection	2,045	46	D	2,405	22	C	1,819	29	C
Southbrook Road / Torlesse Street	North	1,098	6	A	1,297	5	A	903	5	A
	South	704	4	A	828	2	A	663	4	A
	East	38	55	D	16	53	D	11	53	D
	West	33	40	D	29	39	D	27	39	D
	Intersection	1,873	7	A	2,170	5	A	1,603	6	A
Southbrook Road / Pak 'n Save supermarket	North	1,133	5	A	1,295	4	A	926	4	A
	South	754	6	A	885	3	A	724	6	A
	East	33	42	D	33	42	D	33	42	D
	West	52	23	C	52	22	C	52	21	C
	Intersection	1,972	7	A	2,265	5	A	1,735	6	A
Lineside Road / Todds Road	North	1,061	11	B	1,181	11	B	801	10	A
	South	771	23	C	894	5	A	717	13	B
	West	34	79	F	43	42	D	23	41	E
	Intersection	1,866	79	F	2,118	9	A	1,540	41	E
Lineside Road / Flaxton Road	North	1,051	10	A	1,168	7	A	800	9	A
	South	545	2	A	661	6	A	537	2	A
	West	270	38	E	271	44	D	276	24	C
	Intersection	1,866	38	E	2,101	11	B	1,614	24	C
Coldstream Road / REL	South	0	0	-	0	0	-	0	0	-
	East	188	0	A	136	0	A	176	0	A
	West	177	0	A	167	0	A	252	0	A
	Intersection	366	0	A	303	0	A	428	0	A
Kippenberger Ave / MacPhail Ave	North	143	12	B	140	12	B	202	12	B
	South	70	12	B	63	12	B	87	12	B
	East	307	10	A	316	10	A	421	10	A
	West	261	10	A	268	10	A	282	10	A
	Intersection	781	11	B	787	11	B	992	11	B
Northbrook Road / MacPhail Ave / REL	North	91	6	A	85	5	A	284	11	B
	South	0	0	-	0	0	-	201	8	A
	East	58	5	A	35	5	A	46	11	B
	West	138	1	A	99	1	A	219	11	B
	Intersection	287	6	A	219	5	A	750	10	A
REL / Boys Road	North	0	11	-	0	11	-	404	11	B
	South	0	0	-	0	0	-	115	10	A
	East	38	11	B	63	11	B	78	10	A
	West	60	11	B	83	11	B	169	10	A
	Intersection	98	11	B	146	11	B	767	10	A
REL / Marsh Road	North	0	0	-	0	0	-	404	5	A
	South	0	0	-	0	0	-	135	6	A
	East	84	0	A	73	0	A	38	8	A
	West	53	0	A	55	0	A	12	9	A
	Intersection	137	0	A	128	0	A	590	9	A
Lineside Road / REL	North	0	0	-	0	0	-	422	12	B
	South	533	0	A	619	0	A	582	12	B
	West	858	0	A	926	0	A	632	15	B
	Intersection	1,391	0	A	1,545	0	A	1,636	13	B

AM Peak LOS Intersection	Approach	2038 Do Minimum Veh	Delay	LOS	2038 Option A Veh	Delay	LOS	2038 Option B.1a Veh	Delay	LOS
Ashley Street / Coldstream Road	North	538	2	A	628	2	A	662	2	A
	South	275	8	A	286	9	A	256	9	A
	East	244	13	B	220	15	B	251	11	B
	Intersection	1,058	13	B	1,133	15	B	1,169	11	B
Ashley Street / High Street	North	483	25	C	574	31	C	446	26	C
	South	473	23	C	546	30	C	420	22	C
	East	343	35	C	345	35	C	309	33	C
	West	172	24	C	223	25	C	170	24	C
	Intersection	1,472	27	C	1,688	30	C	1,345	26	C
Ivory Street / Northbrook Road	North	624	2	A	671	20	B	429	2	A
	East	273	91	F	268	57	E	356	29	D
	West	669	15	B	748	17	B	607	9	A
	Intersection	1,566	91	F	1,686	24	C	1,392	29	D
Percival Street / Victoria Street	North	42	50	E	60	54	F	49	36	E
	South	907	3	A	1,041	1	A	831	3	A
	East	661	13	B	866	14	B	593	11	B
	Intersection	1,609	50	E	1,967	54	F	1,473	36	E
Percival Street / Johns Road	North	691	14	B	913	16	C	621	13	B
	South	845	3	A	970	1	A	753	2	A
	West	248	57	F	248	57	F	237	39	E
	Intersection	1,784	57	F	2,131	57	F	1,611	39	E
Percival Street / Charles Street	North	668	13	B	888	12	B	574	10	A
	South	650	8	A	856	15	B	591	8	A
	East	384	127	F	390	79	F	129	36	E
	West	130	41	E	69	41	E	103	24	C
	Intersection	1,831	127	F	2,203	79	F	1,397	36	E
Southbrook Road / South Belt / Percival Street / Boys Road	North	586	0	A	997	30	C	475	36	D
	South	735	48	D	823	16	B	708	27	C
	East	266	250	F	406	164	F	278	42	D
	West	479	28	C	611	26	C	546	20	B
	Intersection	2,066	56	E	2,837	44	D	2,007	30	C
Southbrook Road / Torlesse Street	North	1,105	5	A	1,532	6	A	917	5	A
	South	706	5	A	811	2	A	676	4	A
	East	53	56	E	55	56	E	14	52	D
	West	79	621	F	26	39	D	23	39	D
	Intersection	1,944	31	C	2,424	6	A	1,631	6	A
Southbrook Road / Pak 'n Save supermarket	North	1,106	5	A	1,528	4	A	936	4	A
	South	757	7	A	846	3	A	713	6	A
	East	36	42	D	36	42	D	36	42	D
	West	52	23	C	52	21	C	52	20	B
	Intersection	1,952	7	A	2,462	5	A	1,736	6	A
Lineside Road / Todds Road	North	995	11	B	1,377	12	B	770	10	A
	South	762	20	C	847	5	A	705	13	B
	West	71	113	F	58	44	D	24	41	E
	Intersection	1,828	113	F	2,282	10	A	1,499	41	E
Lineside Road / Flaxton Road	North	1,000	9	A	1,375	9	A	768	11	B
	South	524	2	A	613	6	A	595	2	A
	West	281	36	E	282	45	D	294	23	C
	Intersection	1,805	36	E	2,271	13	B	1,656	23	C
Coldstream Road / REL	South	62	8	A	59	8	A	86	10	A
	East	199	2	A	178	2	A	186	2	A
	West	322	5	A	312	5	A	490	5	A
	Intersection	583	8	A	549	8	A	762	10	A
Kippenberger Ave / MacPhail Ave	North	339	13	B	344	14	B	474	14	B
	South	119	15	B	102	14	B	187	13	B
	East	458	12	B	417	12	B	455	14	B
	West	240	10	A	382	10	A	404	11	B
	Intersection	1,156	12	B	1,245	12	B	1,519	13	B
Northbrook Road / MacPhail Ave / REL	North	84	12	B	97	10	A	372	13	B
	South	0	0	-	0	0	-	409	9	A
	East	376	7	A	404	6	A	260	14	B
	West	495	2	A	311	2	A	449	12	B
	Intersection	954	12	B	811	10	A	1,490	12	B
REL / Boys Road	North	0	11	-	0	11	-	749	13	B
	South	0	0	-	0	0	-	209	10	A
	East	28	11	B	43	11	B	83	14	B
	West	68	11	B	112	11	B	252	10	A
	Intersection	96	11	B	154	11	B	1,293	12	B
REL / Marsh Road	North	0	0	-	0	0	-	794	5	A
	South	0	0	-	0	0	-	169	10	A
	East	97	0	A	88	0	A	39	16	C
	West	59	0	A	57	0	A	13	16	C
	Intersection	156	0	A	144	0	A	1,015	16	C
Lineside Road / REL	North	0	0	-	0	0	-	810	13	B
	South	501	0	A	566	0	A	583	13	B
	West	866	0	A	1,049	0	A	548	15	B
	Intersection	1,367	0	A	1,615	0	A	1,941	14	B

AM Peak LOS Intersection	Approach	2048 Do Minimum Veh	Delay	LOS	2048 Option A Veh	Delay	LOS	2048 Option B.1a Veh	Delay	LOS
Ashley Street / Coldstream Road	North	668	2	A	700	2	A	695	2	A
	South	326	9	A	374	10	A	283	10	A
	East	310	24	C	250	25	C	325	19	C
	Intersection	1,304	24	C	1,324	25	C	1,302	19	C
Ashley Street / High Street	North	510	25	C	564	32	C	519	27	C
	South	483	25	C	588	32	C	449	25	C
	East	426	42	D	404	42	D	396	37	D
	West	221	25	C	296	27	C	203	24	C
	Intersection	1,641	30	C	1,852	33	C	1,568	29	C
Ivory Street / Northbrook Road	North	697	2	A	738	27	C	575	2	A
	East	239	141	F	282	98	F	286	47	E
	West	665	19	C	797	17	B	693	12	B
	Intersection	1,601	141	F	1,816	34	C	1,554	47	E
Percival Street / Victoria Street	North	44	62	F	84	68	F	107	42	E
	South	879	3	A	1,076	1	A	841	3	A
	East	709	13	B	949	15	B	601	12	B
	Intersection	1,632	62	F	2,109	68	F	1,549	42	E
Percival Street / Johns Road	North	744	13	B	990	17	C	629	13	B
	South	773	2	A	999	1	A	773	2	A
	West	290	73	F	260	74	F	235	42	E
	Intersection	1,807	73	F	2,248	74	F	1,637	42	E
Percival Street / Charles Street	North	745	15	B	970	13	B	582	11	B
	South	625	8	A	904	18	C	622	8	A
	East	393	179	F	439	115	F	160	45	E
	West	108	59	F	61	57	F	95	27	D
	Intersection	1,871	179	F	2,375	115	F	1,459	45	E
Southbrook Road / South Belt / Percival Street / Boys Road	North	619	0	A	1,140	51	D	501	46	D
	South	720	58	E	881	17	B	700	29	C
	East	280	2	A	407	155	F	318	51	D
	West	334	10	A	579	26	C	563	20	B
	Intersection	1,953	24	C	3,008	50	D	2,082	34	C
Southbrook Road / Torlesse Street	North	1,019	5	A	1,672	6	A	936	5	A
	South	691	5	A	861	2	A	668	4	A
	East	59	58	E	64	60	E	27	52	D
	West	143	274	F	59	38	D	22	39	D
	Intersection	1,912	27	C	2,656	7	A	1,653	6	A
Southbrook Road / Pak 'n Save supermarket	North	1,064	5	A	1,664	4	A	955	4	A
	South	760	7	A	895	3	A	702	6	A
	East	39	43	D	39	42	D	39	42	D
	West	51	24	C	51	22	C	51	21	C
	Intersection	1,914	7	A	2,649	5	A	1,747	6	A
Lineside Road / Todds Road	North	951	11	B	1,505	13	B	780	10	A
	South	772	19	C	892	5	A	698	13	B
	West	88	243	F	95	50	D	29	45	E
	Intersection	1,810	243	F	2,492	11	B	1,508	45	E
Lineside Road / Flaxton Road	North	953	9	A	1,443	12	B	783	11	B
	South	527	2	A	649	6	A	574	2	A
	West	297	39	E	297	47	D	310	25	C
	Intersection	1,777	39	E	2,389	15	B	1,667	25	C
Coldstream Road / REL	South	88	10	A	74	9	A	99	11	B
	East	277	2	A	216	2	A	271	2	A
	West	406	6	A	379	5	A	481	6	A
	Intersection	771	10	A	669	9	A	851	11	B
Kippenberger Ave / MacPhail Ave	North	344	13	B	366	13	B	484	15	B
	South	248	16	B	151	14	B	233	14	B
	East	479	13	B	460	13	B	461	18	B
	West	351	11	B	302	11	B	450	12	B
	Intersection	1,422	13	B	1,278	12	B	1,627	15	B
Northbrook Road / MacPhail Ave / REL	North	155	12	B	233	13	B	454	17	B
	South	0	0	-	0	0	-	405	9	A
	East	396	7	A	388	6	A	193	16	B
	West	480	2	A	426	2	A	594	13	B
	Intersection	1,030	12	B	1,047	13	B	1,646	14	B
REL / Boys Road	North	0	11	-	0	11	-	750	13	B
	South	0	0	-	0	0	-	212	10	A
	East	36	11	B	40	11	B	94	14	B
	West	70	11	B	98	11	B	270	10	A
	Intersection	106	11	B	138	11	B	1,327	12	B
REL / Marsh Road	North	0	0	-	0	0	-	839	5	A
	South	0	0	-	0	0	-	196	11	B
	East	109	0	A	97	0	A	37	18	C
	West	87	0	A	111	0	A	13	19	C
	Intersection	197	0	A	208	0	A	1,085	19	C
Lineside Road / REL	North	0	0	-	0	0	-	852	13	B
	South	491	0	A	602	0	A	578	13	B
	West	922	0	A	1,113	0	A	570	15	B
	Intersection	1,413	0	A	1,716	0	A	2,000	14	B

PM Peak LOS Intersection	Approach	2028 Do Minimum Veh	Delay	LOS	2028 Option A Veh	Delay	LOS	2028 Option B.1a Veh	Delay	LOS
Ashley Street / Coldstream Road	North	340	1	A	365	2	A	364	2	A
	South	354	6	A	434	6	A	343	6	A
	East	421	17	C	358	20	C	450	19	C
	Intersection	**1,115**	17	**C**	**1,156**	20	**C**	**1,158**	19	**C**
Ashley Street / High Street	North	521	27	C	553	30	C	504	27	C
	South	720	30	C	815	42	D	691	29	C
	East	251	28	C	255	31	C	248	28	C
	West	215	27	C	388	35	C	195	26	C
	Intersection	**1,707**	29	**C**	**2,012**	36	**D**	**1,638**	28	**C**
Ivory Street / Northbrook Road	North	724	2	A	766	16	B	628	2	A
	East	183	40	E	254	36	D	256	23	C
	West	765	22	C	933	14	B	619	11	B
	Intersection	**1,672**	40	**E**	**1,952**	18	**B**	**1,504**	23	**C**
Percival Street / Victoria Street	North	34	73	F	75	98	F	85	73	F
	South	989	3	A	1,298	1	A	900	3	A
	East	765	15	B	934	21	C	715	12	B
	Intersection	**1,787**	73	**F**	**2,308**	98	**F**	**1,701**	73	**F**
Percival Street / Johns Road	North	783	19	C	988	25	C	782	17	C
	South	976	3	A	1,415	1	A	930	3	A
	West	149	64	F	147	73	F	171	53	F
	Intersection	**1,908**	64	**F**	**2,549**	73	**F**	**1,883**	53	**F**
Percival Street / Charles Street	North	706	17	C	953	22	C	689	16	C
	South	899	8	A	1,336	17	C	838	8	A
	East	178	74	F	99	90	F	103	61	F
	West	67	49	E	74	56	F	83	38	E
	Intersection	**1,850**	74	**F**	**2,462**	90	**F**	**1,712**	61	**F**
Southbrook Road / South Belt / Percival Street / Boys Road	North	598	36	D	764	19	B	531	28	C
	South	1,076	60	E	1,675	20	B	1,084	39	D
	East	211	39	D	220	40	D	157	39	D
	West	426	21	C	372	21	C	308	20	B
	Intersection	**2,312**	45	**D**	**3,031**	21	**C**	**2,081**	34	**C**
Southbrook Road / Torlesse Street	North	881	9	A	1,068	4	A	772	7	A
	South	1,133	10	A	1,638	3	A	1,061	10	A
	East	60	39	D	77	39	D	58	38	D
	West	25	34	C	25	34	C	24	34	C
	Intersection	**2,100**	11	**B**	**2,808**	5	**A**	**1,915**	10	**A**
Southbrook Road / Pak 'n Save supermarket	North	920	17	B	1,096	14	B	806	14	B
	South	1,038	28	C	1,515	7	A	933	19	B
	East	133	34	C	133	34	C	133	34	C
	West	189	28	C	189	26	C	189	24	C
	Intersection	**2,280**	24	**C**	**2,934**	12	**B**	**2,061**	19	**B**
Lineside Road / Todds Road	North	1,015	22	C	1,153	3	A	865	16	C
	South	1,110	19	C	1,553	4	A	1,000	12	B
	West	21	127	F	61	46	D	32	90	F
	Intersection	**2,146**	127	**F**	**2,767**	4	**A**	**1,896**	90	**F**
Lineside Road / Flaxton Road	North	954	25	C	1,141	8	A	864	14	B
	South	853	2	A	1,050	17	B	679	2	A
	West	300	74	F	532	32	C	441	59	F
	Intersection	**2,107**	74	**F**	**2,722**	16	**B**	**1,985**	59	**F**
Coldstream Road / REL	South	0	0	-	0	0	-	0	0	-
	East	422	0	A	306	0	A	466	0	A
	West	256	0	A	227	0	A	276	0	A
	Intersection	**678**	0	**A**	**534**	0	**A**	**742**	0	**A**
Kippenberger Ave / MacPhail Ave	North	51	13	B	27	12	B	40	12	B
	South	111	13	B	76	12	B	220	13	B
	East	407	10	A	398	10	A	436	10	A
	West	479	11	B	482	11	B	481	11	B
	Intersection	**1,048**	11	**B**	**983**	10	**A**	**1,178**	11	**B**
Northbrook Road / MacPhail Ave / REL	North	51	6	A	54	6	A	198	11	B
	South	0	0	-	0	0	-	439	9	A
	East	100	5	A	74	5	A	81	10	A
	West	204	2	A	163	1	A	243	11	B
	Intersection	**356**	6	**A**	**291**	6	**A**	**961**	10	**A**
REL / Boys Road	North	0	11	-	0	11	-	224	10	A
	South	0	0	-	0	0	-	431	11	B
	East	82	11	B	101	11	B	100	10	A
	West	53	11	B	76	11	B	139	11	B
	Intersection	**135**	11	**B**	**177**	11	**B**	**894**	10	**A**
REL / Marsh Road	North	0	0	-	0	0	-	224	6	A
	South	0	0	-	0	0	-	467	5	A
	East	47	0	A	42	0	A	22	10	A
	West	122	0	A	104	0	A	50	10	A
	Intersection	**168**	0	**A**	**146**	0	**A**	**762**	10	**A**
Lineside Road / REL	North	0	0	-	0	0	-	254	12	B
	South	897	0	A	1,101	0	A	1,047	17	B
	West	783	0	A	883	0	A	709	15	B
	Intersection	**1,680**	0	**A**	**1,984**	0	**A**	**2,010**	16	**B**

PM Peak LOS Intersection	Approach	2038 Do Minimum Veh	Delay	LOS	2038 Option A Veh	Delay	LOS	2038 Option B.1a Veh	Delay	LOS
Ashley Street / Coldstream Road	North	431	2	A	455	2	A	475	2	A
	South	493	7	A	571	7	A	456	7	A
	East	499	45	E	478	68	F	594	68	F
	Intersection	**1,422**	45	**E**	**1,503**	68	**F**	**1,525**	68	**F**
Ashley Street / High Street	North	567	30	C	601	37	D	563	29	C
	South	730	35	C	850	53	D	721	33	C
	East	331	35	C	337	35	C	365	36	D
	West	448	43	D	493	53	D	357	34	C
	Intersection	**2,075**	36	**D**	**2,282**	46	**D**	**2,006**	33	**C**
Ivory Street / Northbrook Road	North	836	3	A	815	19	B	799	2	A
	East	184	98	F	275	51	D	256	65	F
	West	934	39	E	1,034	21	C	784	22	C
	Intersection	**1,955**	98	**F**	**2,123**	24	**C**	**1,839**	65	**F**
Percival Street / Victoria Street	North	60	107	F	90	108	F	104	84	F
	South	1,099	4	A	1,353	1	A	979	3	A
	East	768	20	C	854	25	C	724	15	B
	Intersection	**1,927**	107	**F**	**2,297**	108	**F**	**1,807**	84	**F**
Percival Street / Johns Road	North	782	21	C	900	28	D	760	18	C
	South	1,037	4	A	1,388	1	A	962	3	A
	West	234	83	F	201	94	F	238	61	F
	Intersection	**2,053**	83	**F**	**2,489**	94	**F**	**1,960**	61	**F**
Percival Street / Charles Street	North	716	18	C	822	24	C	681	16	C
	South	954	8	A	1,442	15	B	862	8	A
	East	258	139	F	238	123	F	145	84	F
	West	59	68	F	47	69	F	82	47	E
	Intersection	**1,987**	139	**F**	**2,549**	123	**F**	**1,769**	84	**F**
Southbrook Road / South Belt / Percival Street / Boys Road	North	582	34	C	778	20	B	485	26	C
	South	1,137	89	F	1,674	82	F	1,182	38	D
	East	351	86	F	394	64	E	304	49	D
	West	683	24	C	597	23	C	419	21	C
	Intersection	**2,753**	61	**E**	**3,443**	55	**D**	**2,391**	34	**C**
Southbrook Road / Torlesse Street	North	879	9	A	1,089	5	A	760	7	A
	South	1,237	13	B	1,675	4	A	1,127	14	B
	East	168	43	D	162	42	D	120	42	D
	West	21	36	D	21	36	D	20	34	C
	Intersection	**2,306**	14	**B**	**2,947**	6	**A**	**2,027**	13	**B**
Southbrook Road / Pak 'n Save supermarket	North	921	18	B	1,117	13	B	781	14	B
	South	1,084	44	D	1,530	7	A	964	22	C
	East	153	34	C	153	34	C	153	34	C
	West	202	28	C	202	26	C	202	26	C
	Intersection	**2,361**	32	**C**	**3,002**	12	**B**	**2,100**	20	**B**
Lineside Road / Todds Road	North	986	27	D	1,179	4	A	833	19	C
	South	1,166	18	C	1,574	4	A	1,022	12	B
	West	22	148	F	59	46	D	29	97	F
	Intersection	**2,174**	148	**F**	**2,813**	5	**A**	**1,884**	97	**F**
Lineside Road / Flaxton Road	North	923	53	F	1,125	8	A	816	16	C
	South	994	2	A	1,062	18	B	729	2	A
	West	209	95	F	541	33	C	467	84	F
	Intersection	**2,125**	95	**F**	**2,728**	17	**B**	**2,013**	84	**F**
Coldstream Road / REL	South	122	10	A	119	10	A	124	13	B
	East	399	3	A	376	3	A	495	3	A
	West	319	6	A	305	6	A	397	7	A
	Intersection	**840**	10	**A**	**800**	10	**A**	**1,015**	13	**B**
Kippenberger Ave / MacPhail Ave	North	251	16	B	242	16	B	292	19	B
	South	258	14	B	205	12	B	306	15	B
	East	492	12	B	459	12	B	515	13	B
	West	712	13	B	736	13	B	761	16	B
	Intersection	**1,712**	13	**B**	**1,641**	13	**B**	**1,874**	15	**B**
Northbrook Road / MacPhail Ave / REL	North	115	11	B	139	12	B	330	13	B
	South	0	0	-	0	0	-	546	11	B
	East	350	7	A	368	6	A	209	13	B
	West	530	2	A	458	2	A	502	13	B
	Intersection	**996**	11	**B**	**965**	12	**B**	**1,588**	12	**B**
REL / Boys Road	North	0	11	-	0	11	-	418	11	B
	South	0	0	-	0	0	-	570	12	B
	East	91	11	B	98	11	B	137	11	B
	West	122	11	B	112	11	B	287	12	B
	Intersection	**213**	11	**B**	**210**	11	**B**	**1,413**	11	**B**
REL / Marsh Road	North	0	0	-	0	0	-	341	7	A
	South	0	0	-	0	0	-	632	6	A
	East	89	0	A	78	0	A	43	14	B
	West	112	0	A	122	0	A	53	15	B
	Intersection	**201**	0	**A**	**200**	0	**A**	**1,070**	15	**B**
Lineside Road / REL	North	0	0	-	0	0	-	391	12	B
	South	1,040	0	A	1,105	0	A	1,175	23	C
	West	775	0	A	852	0	A	695	15	B
	Intersection	**1,815**	0	**A**	**1,958**	0	**A**	**2,260**	19	**B**

PM Peak LOS Intersection	Approach	2048 Do Minimum Veh	Delay	LOS	2048 Option A Veh	Delay	LOS	2048 Option B.1a Veh	Delay	LOS
Ashley Street / Coldstream Road	North	612	2	A	632	2	A	635	2	A
	South	819	8	A	849	8	A	850	9	A
	East	522	195	F	505	254	F	570	210	F
	Intersection	**1,952**	195	**F**	**1,986**	254	**F**	**2,056**	210	**F**
Ashley Street / High Street	North	573	32	C	581	41	D	595	31	C
	South	805	59	E	894	84	F	771	52	D
	East	430	43	D	458	47	D	448	44	D
	West	537	65	E	553	100	F	496	55	D
	Intersection	**2,345**	51	**D**	**2,487**	71	**E**	**2,310**	46	**D**
Ivory Street / Northbrook Road	North	837	3	A	818	21	C	790	2	A
	East	140	130	F	258	61	E	184	92	F
	West	1,043	34	D	1,080	24	C	911	19	C
	Intersection	**2,020**	130	**F**	**2,155**	27	**C**	**1,885**	92	**F**
Percival Street / Victoria Street	North	65	127	F	105	118	F	98	92	F
	South	1,177	5	A	1,431	1	A	1,062	4	A
	East	707	28	D	814	28	D	646	20	C
	Intersection	**1,950**	127	**F**	**2,350**	118	**F**	**1,806**	92	**F**
Percival Street / Johns Road	North	720	27	D	859	31	D	669	20	C
	South	1,102	4	A	1,452	1	A	1,025	4	A
	West	196	97	F	195	91	F	243	67	F
	Intersection	**2,018**	97	**F**	**2,506**	91	**F**	**1,937**	67	**F**
Percival Street / Charles Street	North	663	21	C	790	26	D	621	18	C
	South	994	8	A	1,571	16	C	910	7	A
	East	319	156	F	294	128	F	194	97	F
	West	87	80	F	46	74	F	83	52	F
	Intersection	**2,063**	156	**F**	**2,701**	128	**F**	**1,809**	97	**F**
Southbrook Road / South Belt / Percival Street / Boys Road	North	613	36	D	814	20	B	453	25	C
	South	1,175	101	F	1,779	29	C	1,171	50	D
	East	340	94	F	411	63	E	351	60	E
	West	851	28	C	715	25	C	536	22	C
	Intersection	**2,978**	66	**E**	**3,719**	30	**C**	**2,511**	41	**D**
Southbrook Road / Torlesse Street	North	920	12	B	1,177	5	A	755	7	A
	South	1,258	14	B	1,772	4	A	1,141	15	B
	East	322	55	D	285	50	D	131	42	D
	West	20	40	D	20	39	D	19	34	C
	Intersection	**2,520**	18	**B**	**3,254**	8	**A**	**2,045**	14	**B**
Southbrook Road / Pak 'n Save supermarket	North	983	20	B	1,213	13	B	778	14	B
	South	1,089	59	E	1,615	7	A	980	25	C
	East	164	35	C	164	35	C	164	35	C
	West	200	28	C	200	27	C	200	27	C
	Intersection	**2,437**	39	**D**	**3,193**	12	**B**	**2,123**	22	**C**
Lineside Road / Todds Road	North	1,041	32	D	1,273	5	A	842	22	C
	South	1,167	21	C	1,650	4	A	1,068	11	B
	West	22	163	F	82	51	D	28	110	F
	Intersection	**2,230**	163	**F**	**3,006**	6	**A**	**1,939**	110	**F**
Lineside Road / Flaxton Road	North	966	74	F	1,225	10	A	821	26	D
	South	1,011	3	A	1,115	19	B	820	2	A
	West	196	110	F	575	38	D	427	127	F
	Intersection	**2,173**	110	**F**	**2,915**	19	**B**	**2,068**	127	**F**
Coldstream Road / REL	South	116	12	B	111	11	B	119	14	B
	East	438	3	A	409	3	A	482	3	A
	West	398	7	A	375	6	A	468	7	A
	Intersection	**953**	12	**B**	**895**	11	**B**	**1,069**	14	**B**
Kippenberger Ave / MacPhail Ave	North	459	16	B	449	16	B	447	25	C
	South	271	15	B	233	14	B	324	17	B
	East	510	13	B	500	13	B	593	16	B
	West	584	12	B	577	12	B	703	15	B
	Intersection	**1,824**	14	**B**	**1,759**	13	**B**	**2,067**	18	**B**
Northbrook Road / MacPhail Ave / REL	North	128	12	B	152	12	B	344	14	B
	South	0	0	-	0	0	-	521	10	A
	East	354	7	A	384	7	A	192	15	B
	West	541	2	A	514	2	A	560	14	B
	Intersection	**1,022**	12	**B**	**1,050**	12	**B**	**1,617**	13	**B**
REL / Boys Road	North	0	11	-	0	11	-	528	12	B
	South	0	0	-	0	0	-	631	12	B
	East	81	11	B	94	11	B	120	12	B
	West	149	11	B	151	11	B	334	12	B
	Intersection	**230**	11	**B**	**245**	11	**B**	**1,613**	12	**B**
REL / Marsh Road	North	0	0	-	0	0	-	440	8	A
	South	0	0	-	0	0	-	669	7	A
	East	177	0	A	186	0	A	147	21	C
	West	110	0	A	121	0	A	53	20	C
	Intersection	**286**	0	**A**	**307**	0	**A**	**1,308**	21	**C**
Lineside Road / REL	North	0	0	-	0	0	-	545	13	B
	South	1,095	0	A	1,150	0	A	1,239	34	C
	West	832	0	A	902	0	A	696	15	B
	Intersection	**1,927**	0	**A**	**2,052**	0	**A**	**2,480**	24	**C**

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WAIMAKARIRI DISTRICT COUNCIL

RANGIORA EASTERN LINK

Single Stage Business Case

March 2025
Trim 250319046050

Placeholder image

Prepared by

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Revision History:

Revision N°	*Description*	*TRIM*	*Date*
A	Draft Strategic and Economic Cases	250319046050	March 2025

Document Acceptance:

Action	*Name*		*Signed*	*Date*
Prepared by	Rob Kerr	REL Programme Manager		
Reviewed by	Don Young Joanne McBride	Senior Engineering Advisor Roading and Transport Manager		
Approved by	Gerard Cleary	General Manager, Utilities and Roading		
Adopted by	Council			

Executive Summary

Project Overview

The Rangiora Eastern Link (REL) is a proposed 2.88 km arterial road designed to relieve traffic congestion on Southbrook Road, enhance transport efficiency, and unlock new residential areas in East Rangiora and commercial development in Southbrook. With the town being a Priority Development Area in Greater Christchurch, this investment is essential to accommodate the region's rapid growth.

Strategic Need & Objectives

Rangiora's population is expected to grow significantly, with over 5,000 new homes planned in East Rangiora alone. Currently, Southbrook Road carries over 23,000 vehicles per day, leading to severe congestion, safety concerns, and inefficient freight movement. The REL will:

- Reduce travel time and congestion in peak periods.
- Improve access to residential and industrial zones.
- Enhance road safety, particularly for pedestrians and cyclists.
- Support economic growth by ensuring reliable transport links.

Alignment with Policy & Growth Plans

The REL aligns with key national, regional, and local strategies, including:

- New Zealand Government Policy Statement (GPS) on Land Transport 2024-34 – Prioritising economic growth, safety, and resilience.
- Canterbury Regional Land Transport Plan (CRLTP) 2024-34 – Addressing congestion, sustainability, and freight efficiency.
- Greater Christchurch Spatial Plan – Supporting intensification and urban expansion.
- Waimakariri District Transport Strategy – Ensuring connectivity for future development.

Preferred Option & Economic Case

Following a detailed multi-criteria analysis (MCA), the preferred option is to increase the capacity of the network through a new arterial route that runs west of the Wastewater Treatment Plant and connects with Northbrook Road, as it provides the best balance of cost-effectiveness, land-use benefits, and project feasibility. The project is expected to:

- Reduce vehicle travel time by 3-4 minutes per trip for those in East Rangiora.
- Decrease vehicle kilometers traveled (VKT) by 7,000 km/day, lowering emissions and fuel costs; and
- Improve intersection performance and freight movement efficiency.
- Deliver an excellent Benefit Cost Ratio of 4.8, with a Net Present Value of over $220 million and a government BCR of 7.7.

More with other three cases.....

Table of Contents

Contents

Introduction

The proposed investment

This business case explores the opportunity to relieve traffic congestion and unlock land for residential development through delivery of a major new collector road in East Rangiora.

Rangiora is a Key Activity Area[1] in Greater Christchurch and the fastest growing town in one of the faster growing districts in New Zealand[2]. The important regional role the town provides Greater Christchurch is reflected by being a Priority Development Area in the Greater Christchurch Spatial Plan (2023)[3]. This status is to facilitate coordinated regional investment and effort that is focused on accelerating and supporting significant growth in the township.

Southbrook is a key industrial and big box retail area on the southern edge of Rangiora which is accessed via Southbrook Road: the key arterial route to Rangiora. Southbrook Road carries in excess of 23,000 vehicle per day, and the mix of through and accessing traffic causes high levels of congestion during peak hours.

These high traffic volumes also sever the local community, with a number of schools and other social destinations, meaning many vulnerable users are forced to cross the busy road at peak times.

This growth has been enabled through significant investment by the Council and Waka Kotahi NZTA over the last number of decades, with further growth being enabled through the various planning instruments including the (Proposed) District Plan. This plan identifies a further 390ha of new residential land on the east side of Rangiora with capacity for over 5,000 homes as well as further commercial and industrial growth in Southbrook.

This growth provides the opportunity to reduce traffic volumes along Southbrook Road, and the district has been planning for this for some time, and the proposed investment was first identified in 2001 as part of the Rangiora Transport Study (Beca 2001). This study forecasted pressure on the transport network as the population grows, as well as identified the opportunity to unlock residential land as part of the solution to improving transport capacity.

The proposed investment is called the Rangiora Eastern Link and will divert traffic via a new 2.88 km long arterial road from the southern end of Rangiora (Lineside Road) to connect with recently constructed urban arterial road through new residential developments that will eventually link to Coldstream Road in the north. Coldstream Road connects to the northern route into/out of the town. On the way the proposed eastern link intersects with the major collector roads to enable traffic to move quickly and efficiently around the town. (Add Map showing route)

Approximately 35% of a new urban arterial road has already been constructed as part of the residential development process and funded through rates, development contributions and the Infrastructure

[1] Canterbury Regional Policy Statement
[2] https://enterprisenorthcanterbury.co.nz/invest/waimakariri-demographics/
[3] https://www.greaterchristchurch.org.nz/urbangrowthprogramme/greater-christchurch-spatial-plan/draft-greater-christchurch-spatial-plan

Acceleration Fund, with a further 15% to be constructed through development. The remaining section (50%) is remaining to be funded and proposed to be delivered through a combination of development contributions and public funding.

This business case sets out the case for investment and the preferred transport solution, along with how the project is proposed to be funded, procured and delivered to enable material reductions in travel time and unlock significant quantities of greenfield residential land and enable commercial growth.

Figure 1: Context Plan

The stakeholders in this proposal

The key partners in this proposed investment are:

- Waimakariri District Council – the sponsor and driver of this investment proposal as the road controlling authority;
- Waka Kotahi / NZTA – as co-funder with the Council of the business case and concept design and potential delivery funding partner;
- Waka Kotahi / NZTA – as owner and manger of the State Highway network, and specifically State Highway 71 (Lineside Road) and feeds into the southern end of Rangiora
- Te Ngāi Tūāhuriri Rūnanga – as mana whenua of the takiwa in which Rangiora is located
- Belgrove and Sparks – Land developers – as the major land developers in East Rangiora
- Kiwirail, as operator of the Main North Truck Railway;
- Southbrook Transport reference group – as a local community group established by the Council providing advice and input to management of traffic on Southbrook Road (being the main corridor into Rangiora from the south;
- Major freight movers, and Southbrook Industrial Park developer
- The Rangiora Ashley Community Board, representing the community of Rangiora, including residents and businesses; and
- Waimakariri District Council – as regulator under the Resource Management Act and as three waters infrastructure operator and manager of the adjacent Rangiora Wastewater Treatment Plant.

The sponsor organisation

The Waimakariri District lies to the north of the Waimakariri River in North Canterbury. The district covers around 225,000 hectares of land and extends from Pegasus Bay in the east to the Pukatea Range in the west and is bounded to the north by the Hurunui District.

Figure 2: Greater Christchurch

The Council is the road controlling authority for the district, with the role of managing the districts transport network. Our goal is *to provide a transport network which is affordable, integrated, safe, responsive and sustainable, and which contributes to the attainment of high quality natural, living and productive environments within the District and assists development of a strong sense of community*.

To deliver upon this goal, Council manages[4]

- *1,562 km of roads (979km sealed and 568km unsealed)*
- *157 bridges and 132 large culverts*
- *385km of footpaths and 25km of shared paths*
- *5,648 Street lights*
- *32 bus shelters*

[4] as at 1 July 2023

The Strategic Case

The Strategic Alignment

This section summarises the alignment of this investment with national, regional nd local priorities. A more detailed exploration is included as appendix xx

Introduction

The Rangiora Eastern Link (REL) is a proposed arterial road aimed at addressing severe congestion on Southbrook Road, unlocking land for residential and economic growth, and enhancing transport efficiency in Greater Christchurch. This project aligns with national, regional, and local strategic objectives by improving transport connectivity, reducing congestion, and facilitating sustainable urban development.

Alignment with National Policies

New Zealand Government Policy Statement (GPS) on Land Transport 2024-34

The project supports the GPS priorities:

- Economic Growth and Productivity: REL enhances the efficiency of people and freight movement, reduces travel times, and unlocks housing development.
- Safety: Addresses congestion-related safety issues, particularly for vulnerable road users crossing Southbrook Road.
- Resilience: Provides an alternative transport route, enhancing network reliability.
- Value for Money: Utilizes existing infrastructure and development contributions for cost-effective delivery.

National Infrastructure Strategy

The project contributes to:

- Net-zero carbon emissions: Reducing congestion and improving travel efficiency lowers vehicle emissions.
- Regional economic growth: Facilitates development and employment in Rangiora.
- Resilient infrastructure: Provides an additional transport lifeline for the township.

Regional and Local Strategic Fit

Greater Christchurch Spatial Plan

- Recognises Rangiora as a Priority Development Area, supporting intensification and development while ensuring infrastructure is in place to handle projected growth.
- Improves transport connectivity by reducing reliance on Southbrook Road and enhancing public transport efficiency.

Canterbury Regional Land Transport Plan (CRLTP) 2024-34

- Identifies REL as a regionally significant project, addressing congestion, access issues, and unlocking greenfield land.
- Supports sustainable transport modes, resilience, and economic growth.

Greater Christchurch Public Transport Futures

- Improves public transport journey times and reliability.
- Supports increased PT (public transport) usage by reducing congestion.

Waimakariri District Growth and Planning

Waimakariri District Transport Programme

- Enables over 5,000 new residential lots in East Rangiora.
- REL integrates with other planned arterial enhances, ensuring efficient freight movement and reliable access to Christchurch.
- Enhances walking and cycling connectivity to support sustainable travel.

Integrated Transport Strategy 2035+

- Ensures the growth does not hinder freight movement.
- Provides safe and efficient transport links for new residential areas.
- Supports multi-modal transport options, including improved pedestrian and cyclist infrastructure.

Proposed District Plan

- The Proposed Waimakariri District Plan plays a crucial role in enabling the Rangiora Eastern Link by setting the framework for extensive residential and commercial development in East Rangiora.
- The plan proposes to rezone over 615 hectares of greenfield land for residential expansion, including enabling more than 5,000 new homes in East Rangiora. Additionally, the district plan provides for the integration of transport infrastructure with urban development, providing essential connectivity through codifying Outline Development Plans.

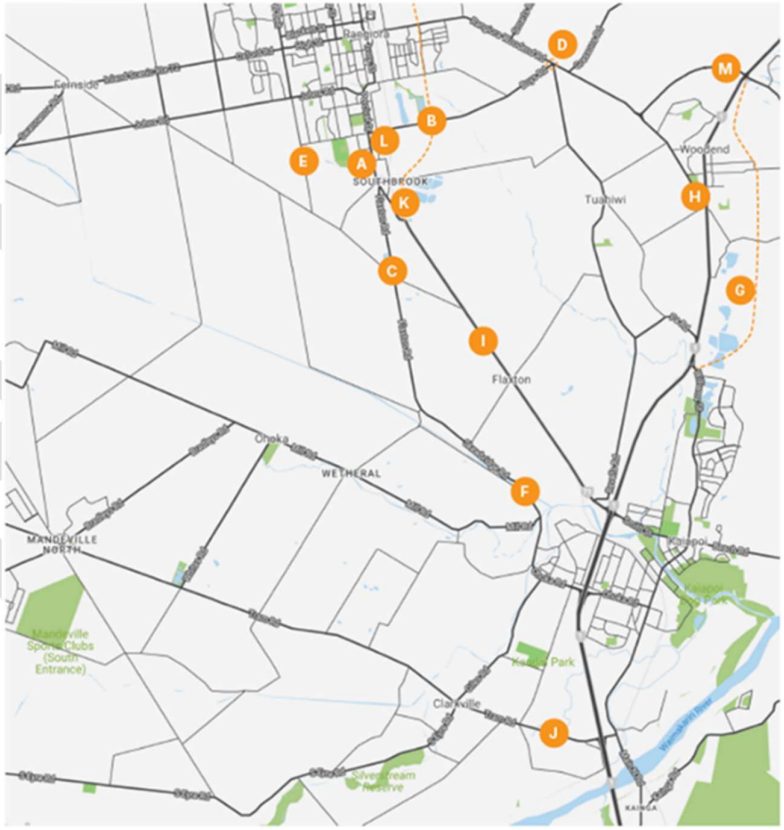


Figure 3: Map of major planned roading projects in the east of the District

The Council has been planning to address congestion and enable growth for over two decades

- The concept of an eastern link was first identified in 2001, and planning for growth has been long standing through various iterations of structure plans, district plans and outline development plans.
- During intervening years there has been continued to be substantial growth which is exacerbating congestion along Southbrook Road.
- The 2001 Rangiora Transport Study (Beca) identified a range of existing and future deficiencies in the transport network. The greatest issue identified was the increasing congestion on the Rangiora North-South strategic route. Also noted was the impact of housing growth, safety at the railway level crossings and the rural/urban fringe and the need for more direct bus routes.
- This study identified an eastern link road from Southbrook to the east of town as the second highest priority project after interim traffic signal improvements on the north-south route. In 2005, Opus (now WSP) completed a Scheme Assessment of a new road, called the Rangiora Eastern Link.
- In 2021, further technical work was undertaken to support a Notice of Requirement to include the route of the road as a designation in the Proposed District Plan. This designation became operative in xxx 2025.
- The proposed Eastern Link was included in the Canterbury Land Transport Plan (2024-2034) and co-funding for this business case work was included in the National land Transport Plan (2024-2034).
- Council has leveraged the land development on the east side of town to progressively advance development of the eastern link between Northbrook Road and Coldstream Road.
- Through major developments such as Belgrove, 35% of the road has already been constructed, with a further 15% to be completed in future subdivision processes, with contributions levied towards the section south of Northbrook Road.

A potted history of the Rangiora Eastern Link

The Investment Environment

This section considers the strategic environment that this investment is being considered, and what may influence the outcomes sought

Major risks and uncertainties

Main Risks	Conseq'ce (H/M/L)	Likelih'd (H/M/L)	Comments and Risk Management Strategies
Land development and growth does not occur as expected	L	L	The District Plan had established the land sue pattern and areas of future development for the next period, and this it is unlikely that this will change materially. Regardless, the benefits of the investment would accrue either slightly faster or slower depending on the place of growth. Investment in development (planning and associated services) are being made in all the major land holdings in east Rangiora.
Mass Rapid Transport is funded and delivered in the near term	L	M	Mass Rapid Transport is being planned for greater Christchurch, with the likely form of link to Rangiora via high frequency buses and park and ride systems. This is already largely in place and the investment would minimise travel time for public transport in rangiora.
Technological change away from private car use	M	L	Should an unknown technology that changes the type and volume of traffic, then this will result in a longer lifespan of the proposed investment.
Insufficient funding with the NLTP to support this investment	H	H	WDC has 75% of the funding in place for the proposed investment, however if it is not able to raise the balance of the funding then the current Long Term Plan, then the investment would not proceed, This was decided on the basis of community feedback as part of the Long Term Plan process.
The [Proposed] District Plan is made operative and not challenged to the Environment Court, affecting the designation for the land.	L	L	The time required to conclude the RMA proceedings are shorter than the development timeframe for this project. There is no objection in place to the designation.
Pressure on rates leads to deferral or removal of funding	H	L	Although the Waimakariri District is subject to pressure on rates as most local authorities in New Zealand, The Council have committed to this project through its LTP provided that NLTP funding is also secured.

Key Assumptions

Main Assumptions	Consequence if incorrect (H/M/L)	Likelihood of incorrect (H/M/L)	Comments and Issue Management Strategies
Traffic forecasts are correct	M	L	The thresholds for action have already been reached (poor level of service and rezoning of esidential land, and hence variation in forecasted traffic volume sis unlikely to make a material change to the benefits

The Case for Change

What are the problems

Growing traffic volumes *have caused severe congestion, leading to increased travel time and unreliability along Southbrook Road.*

New growth areas *on the eastern and south edges of Rangiora have insufficient capacity transport links, which will constrain housing growth and economic activity.*

Higher volumes across all travel modes are ***increasing conflicts and severance,*** *leading to an increased risk of death or serious injury.*

Evidence for these problems

The population has grown fast and will continue to grow growth

Waimakariri District is a member of the Greater Christchurch partnership, a high growth area under National Policy Statement direction. The approved Future Development Strategy, (FDS), for Greater Christchurch anticipates steady District growth from the current population of 67,900 to around 82,000 by 2033, and in the order of 102,000 by 2052. Up to 15,000 additional homes are expected to be required to accommodate population change over the next 30 years

As of 2023, Rangiora's population is estimated at around 21,400 and is projected to grow to approximately 26,200 by 2048 and is a local service centre for about 60% of the district's population. By 2031, it is expected to provide goods and services for around 50,000 people.

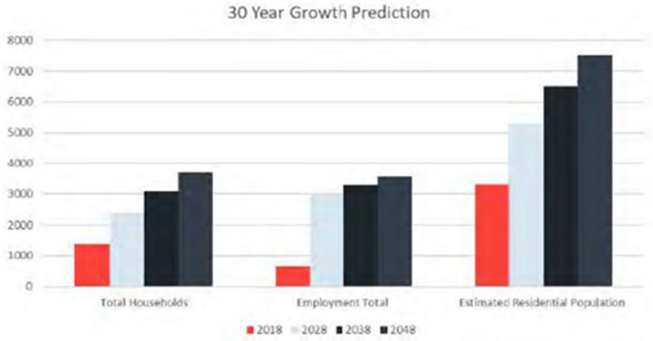


Figure 4 30 year growth forecasts

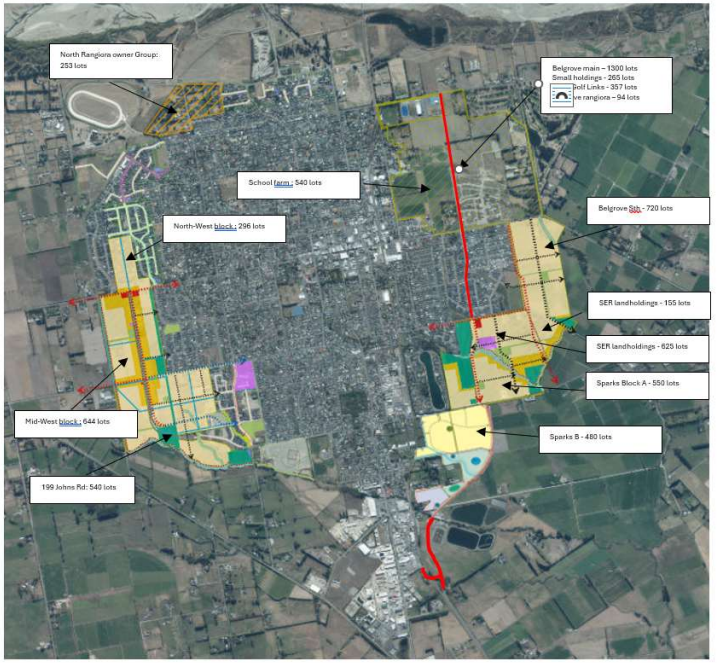


Figure 5: Rangiora Growth areas

The proposed District Plan identifies land for up to 5,086 new residential lots in East Rangiora and a further 1,733 lots in West Rangiora.

The map below shows the areas identified in the [proposed] District Plan for greenfield residential development. This encompasses 415ha to the east of Rangiora, of which approximately 25ha has already been developed, with a potential upper bound yield of 5,086 lots.

A further 200ha of land in West Rangiora is re-zoned with a potential yield of 1,733 lots.

Growing traffic volumes has already caused congestion and slowed travel times

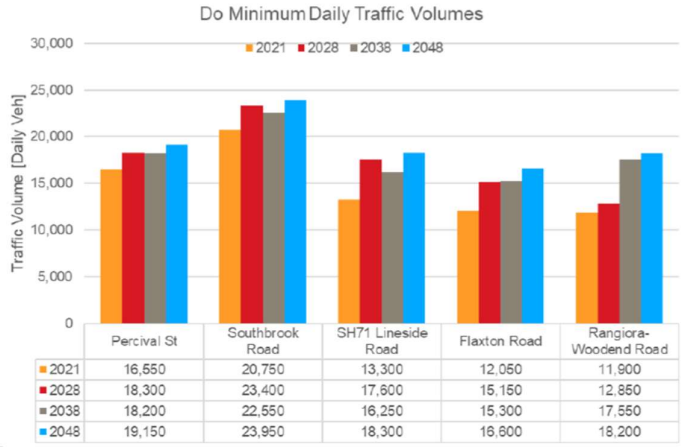
A Transport Assessment[8] has been completed to understand the impact of the growing traffic volumes with and without intervention. Figure xx shows that traffic volumes on Southbrook Road, Lineside Road and Flaxton Road plateau because Southbrook Road is at or near capacity. This is reinforced by the travel times presented in Figure xx and the delays at intersections in figure xx

As development progresses in the eastern growth areas, this also leads to an increase in traffic on the Rangiora-Woodend Road as drivers take alternative routes.

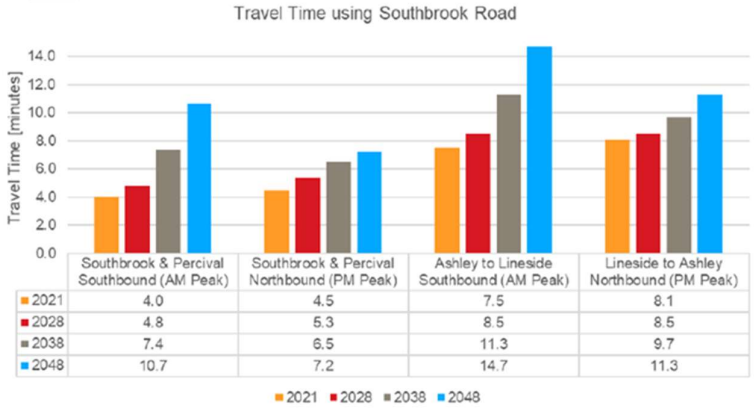
The modelling shows that the intersections along Percival Street and Southbrook Road show increasing levels of delay, meaning it is more difficult to access the north-south corridor. with minor approaches consistently at LOS E/F.

Intersection LOS for AM Peak	2028 Do Minimum			2038 Do Minimum			2048 Do Minimum		
	Veh	Delay	LOS	Veh	Delay	LOS	Veh	Delay	LOS
Ashley Street / Coldstream Road	857	11	B	1,058	13	B	1,304	24	C
Ashley Street / High Street	1,333	25	C	1,472	27	C	1,641	30	C
Ivory Street / Northbrook Road	1,309	23	C	1,566	91	F	1,601	141	F
Percival Street / Victoria Street	1,535	38	E	1,609	50	E	1,632	62	F
Percival Street / Johns Road	1,657	42	E	1,784	57	F	1,807	73	F
Percival Street / Charles Street	1,505	36	E	1,831	127	F	1,871	179	F
Southbrook Road / South Belt / Percival Street / Boys Road	2,045	46	D	2,066	56	E	1,953	24	C
Southbrook Road / Torlesse Street	1,873	7	A	1,944	31	C	1,912	27	C
Southbrook Road / Pak 'n Save supermarket	1,972	7	A	1,952	7	A	1,914	7	A
Lineside Road / Todds Road	1,866	79	F	1,828	113	F	1,810	243	F
Lineside Road / Flaxton Road	1,866	38	E	1,805	36	E	1,777	39	E
Kippenberger Ave / MacPhail Ave	781	11	B	1,156	12	B	1,422	13	B
Northbrook Road / MacPhail Ave	287	6	A	954	12	B	1,030	12	B

The intersection of Ivory Street and Northbrook Road is the southernmost access to the eastern development areas (without an eastern link in place). Here the LOS is forecast to degrade with the uptake of residential development.



	Percival St	Southbrook Road	SH71 Lineside Road	Flaxton Road	Rangiora-Woodend Road
2021	16,550	20,750	13,300	12,050	11,900
2028	18,300	23,400	17,600	15,150	12,850
2038	18,200	22,550	16,250	15,300	17,550
2048	19,150	23,950	18,300	16,800	18,200



	Southbrook & Percival Southbound (AM Peak)	Southbrook & Percival Northbound (PM Peak)	Ashley to Lineside Southbound (AM Peak)	Lineside to Ashley Northbound (PM Peak)
2021	4.0	4.5	7.5	8.1
2028	4.8	5.3	8.5	8.5
2038	7.4	6.5	11.3	9.7
2048	10.7	7.2	14.7	11.3

[8] Rangiora Eastern Link: Transportation Assessment of options. Stantec, 2024

East Rangiora development has been planned around a new arterial connection to enable development

The Outline Development Plans for East Rangiora show a north-south arterial road providing a core transport link

Outline Development Plans (ODP) in the proposed District Plan have been developed through multi-disciplinary processes included transport expertise to prepare viable and robust urban development strategies. This is supported by expertise evidence given at various hearings. An example is referenced[11].

As shown in the ODP to the right, a key element of the ODP is the provision of a new collector road through the development areas and to the south.

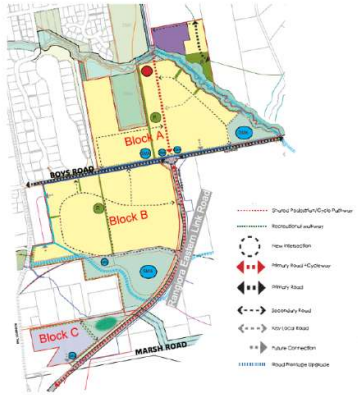


Figure 6 South east Rangiora DSraft Outline Developement Plan

A Transport Assessment (Rangiora Eastern Connection – Technical Assessment - Transportation, WSP 2021) used the CAST[12] traffic model to assess the impact of the likely best project and compared with the do-minimum option of retaining Southbrook Road as the only north-side transport corridor.

Comparing the travel times to/from four destinations in Rangiora show the 41-64% reduction in travel time as a result of the REL. This is in the context of the poorly performing (Level of Service F) intersections along Southbrook Road. The key diagrams from this study are reproduced below.

Without an alternative transport link, these development areas will have poor connection with the town and to Christchurch and travel times will be materially higher and even more unreliable than at present.

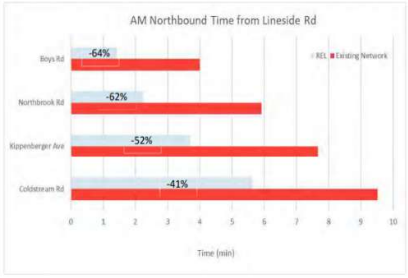
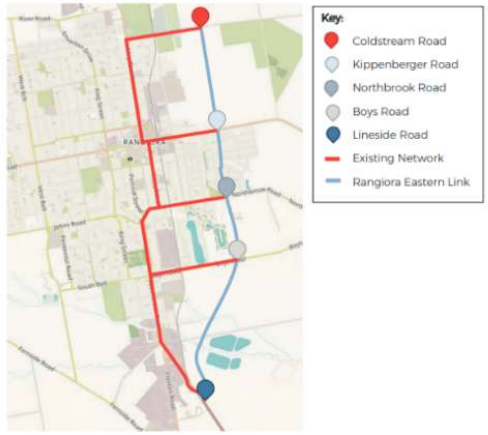


Figure 4-2. AM northbound travel time from Lineside Road.



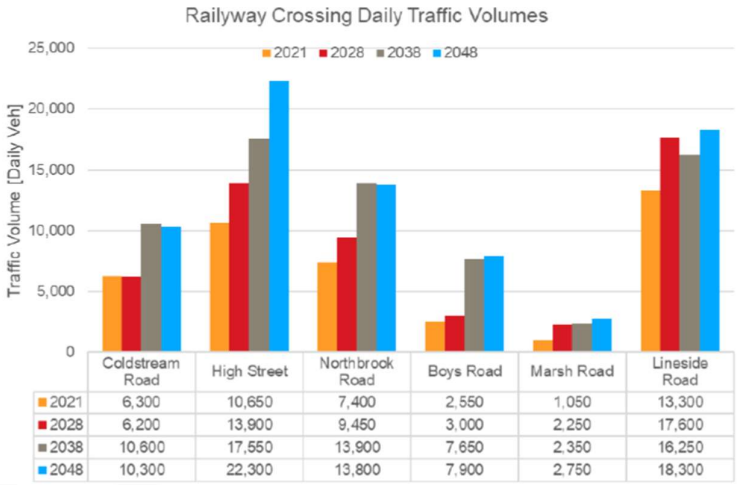
[11] https://www.waimakariri.govt.nz/__data/assets/pdf_file/0019/160732/Lisa-Williams-Transport.pdf

[12] This model is the strategic level traffic model used across Greater Christchurch

Railway Crossing safety

Daily traffic volumes travelling east-west across the level crossings are forecast to increase as a result of growth without intervention. The exception is the railway crossing on Lineside Road where the upstream effects of Southbrook Road limit the daily traffic increase past 2028.

A Level Crossing Safety Impact Assessment (LCSIA) has been completed on the Lineside Road and Marsh Road level crossings. The Level Crossing Safety Score (LCSS) has been assessed as follows:



	Coldstream Road	High Street	Northbrook Road	Boys Road	Marsh Road	Lineside Road
2021	6,300	10,650	7,400	2,550	1,050	13,300
2028	6,200	13,900	9,450	3,000	2,250	17,600
2038	10,600	17,550	13,900	7,650	2,350	16,250
2048	10,300	22,300	13,800	7,900	2,750	18,300

Lineside Road Level Crossing[13]

- LCSS = 40
  - increasing to 42 with growth
- Medium High Risk Band
- Fatal Return period 732 years
  - reducing to 630 years with growth

Marsh Road level Crossing[14]

- LCSS = 44
- Medium High Risk Band
- Fatal Return period 770 years

[13] Lineside Rd LCSIA, Stantec 2025

[14] March Rd and Dunlops Road LCSIA , Stantec 2023

What are the potential benefits

The key benefits and causal links are

The current congestion makes access to businesses difficult
AND
Vehicles trying to pass through are subject to high delays and variability

Benefit One:

Improve peak period travel time and reliability for people and freight

New commercial and residential developments with inefficient transport connections
AND
Deteriorating travel time and reliability on strategic routes for freight and people

Benefit Two:

Increased accessibility to East Rangiora Residential development area and Southbrook Industrial Area

Sub-standard and increasing traffic volumes over level crossings
AND
Severance along Southbrook Rd forcing vulnerable users to cross high volume traffic lanes

Benefit Three:

Reduced risk of death and serious injury

The Waka Kotahi NZTA Land Transport Benefits Framework is a consistent set of benefits and measures that makes it possible to consider, measure and report on all impacts of New Zealand's investment in land transport. They provide a consistent way of measuring benefits across all projects and across time.

The following table sets out which benefits from the framework are expected to accrue from this investment. Refer to Battachment B for the Benefits Map

Benefit cluster	Benefit	Measure
Healthy and safe people 1. Changes in user safety	1.1 Impact on social cost of deaths and serious injuries	1.1.2 Crashes by severity[#]
	1.2 Impact on a safe system	1.2.1 Road assessment rating

Benefit cluster	Benefit	Measure
Economic prosperity 5. Changes in transport costs	5.1 Impact on system reliability	5.1.2 Travel time reliability – motor vehicles[#]
		5.1.3 Travel time delay[#]
	6.2 Impact on network productivity	6.2.6 Access to key economic destinations
Inclusive access 10 Changes in access to social and economic opportunities	10.1 Impact on user experience	10.3.1 Access to key social destinations

The Investment Objectives

Objective One: *Reduce pm peak travel time between Lineside and Northbrook Road by 20% by 2038*

Objective Two: *Improve accessibility from East Rangiora development area to SH1 by 3 minutes by 2038*

Objective Three: *Improve the Infrastructure Risk Rating on strategic roads in South Rangiora to Medium or better by 2038*

Summarising the Case for Change

The fast growing town of Rangiora is an important component of the South Island's largest urban conglomeration, and is a Priority Development Area for greater Christchurch.

This fast growth over the last decades have led to the high levels of congestion currently seen along the major north-south strategic road, but on top of the high growth already experienced, the town is set to grow considerably further with over 6,700 greenfield residential lots enabled under the [proposed] District Plan.

New transport links are required to unlock these development areas and ensure than people and fright can move quickly. But this growth is hindered by the north south strategic corridor that connects business, freight and people to Christchurch that is already severely congested. The desired growth will make this congestion materially worse and cause significant travel time unreliability and delay.

The increasing traffic volumes also highlight existing weaknesses in the network that might otherwise be tolerable, and particularly the level railway crossings and severance created by Southbrook Road.

There is evidence for these problems through modelling, traffic survey and expert evidence as well as lived anecdotal experience of travel delays in peak times reported by residents and businesses.

Without intervention, traffic delay and reliability will continue to deteriorate, access to business and residential areas will worsen and severance and safety issues will increase due to increased volumes of conflict. With national priorities for land transport focused on economic growth and unlocking land for housing, there is a strong case for intervention to address these issues.

The Economic Case – Exploring the Preferred Way Forward

The purpose of the Economic Case is to identify the investment option that optimises value for money. Having determined the Strategic Context for the investment proposal and established a robust case for change, this part of the Economic Case assesses the best solution to address the objectives.

1. **What are we trying to achieve?**	• *Critical Success Factors*
2. **What are choices?**	• *Strategic interventions and response* • Long List and shortlist
3. **How do they stack up?**	• *Economic Assessment* • *Detailed Assessment of Shortlist*
4. **The preferred way forward**	• *The proposed solution*
5. What the solution will deliver	• *Key outcomes and benefits of the preferred solution*

What are we trying to achieve?

The following critical success factors have been developed:

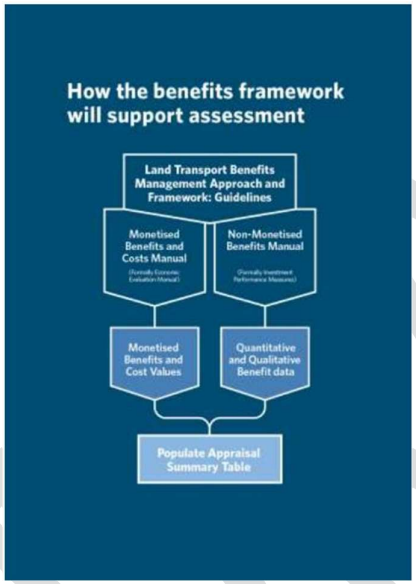
Critical Success Factors	Broad Description
Value for money	• optimises value for money i.e., the optimal mix of potential benefits, costs and risks • balances the cost of delivery and management with the financial and non-financial benefits
Affordable	• can be met from likely available funding • matches other funding constraints • avoids displacing other Island priorities
~~Achievable~~	• in the proposed timeframe • with the current resources and support • within the programme's control and influence • with continuity of operation maintained during the construction period

What are the choices?

Approach to option development

This business case takes a multistage approach to developing, sifting and assessing the options.

The initial optioneering developed the preferred strategic response, following the methodology in Victoria's Department of Treasury and Finance Investment Management Standard.



This process confirmed the need for new infrastructure, and so the next stage was to explore the long and short list of physical options (primarily routes) for the new infrastructure. This used the Early Assessment Sifting Tool (EAST) and then MCA analysis to develop the shortlist, and then detailed MCA assessment incorporating the monetised and non-monetised benefits and costs.

Step	Name	Key question
1	Strategic Interventions	What are the available strategic interventions that might be taken to address the problems identified?
2	Strategic response	What is the preferred strategic response, being a combination of interventions that best delivers the benefits
3	Very Long List of new infrastructure options	What are all the new infrastructure options available (very long list)
4	Early Assessment Sifting Tool (EAST) to determine Long List	What is the reasonable list of long list options to assess
5	Assessment of Long List to determine Short List	How does each options stack up against benefits, critical success criteria and impacts
6	Detailed Assessment of Short List	Which option provides the best value for money
7	Determination of the preferred way forward	Decision on the preferred route

The Do minimum

The do minimum is established as the existing range of projects in the Council's Long Term Plan, with the exception of the Rangiora Eastern Link. These include:

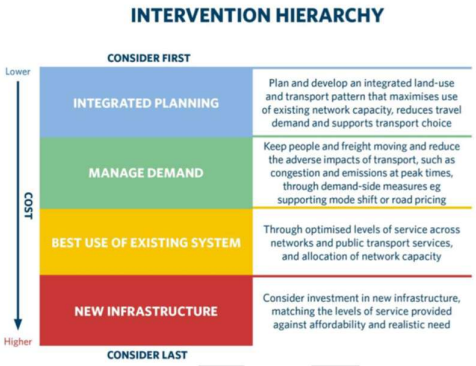
- Western route improvements
- Flaxton/Skew Corridor improvements
- Belfast to Pegasus SH1 Woodend bypass
- Five crossroads improvements
- Other minor works

Of note, it also includes the forecast growth outlined in the Strategic Case.

The Long List of options

Strategic Interventions

To enable value for money and prioritise more space efficient modes of moving people and goods, the NZTA Intervention Hierarchy recommends an approach that considers land use first and investment in new infrastructure last.



In this process, land use has been considered in detail through the district plan and related structure planning processes which are prior to and outside this business case. The optioneering in this Business Case seeks to enable this land use and achieve the best outcome against the objectives.

The table below sets out the schedule of strategic interventions and clusters these against a range of different strategic responses, ranging from Do Nothing, through to changing emphases on economic, safety and demand management. An additional strategy that considers a more radical change to land use and transport in Rangiora is also assessed.

The Preferred Strategic Response

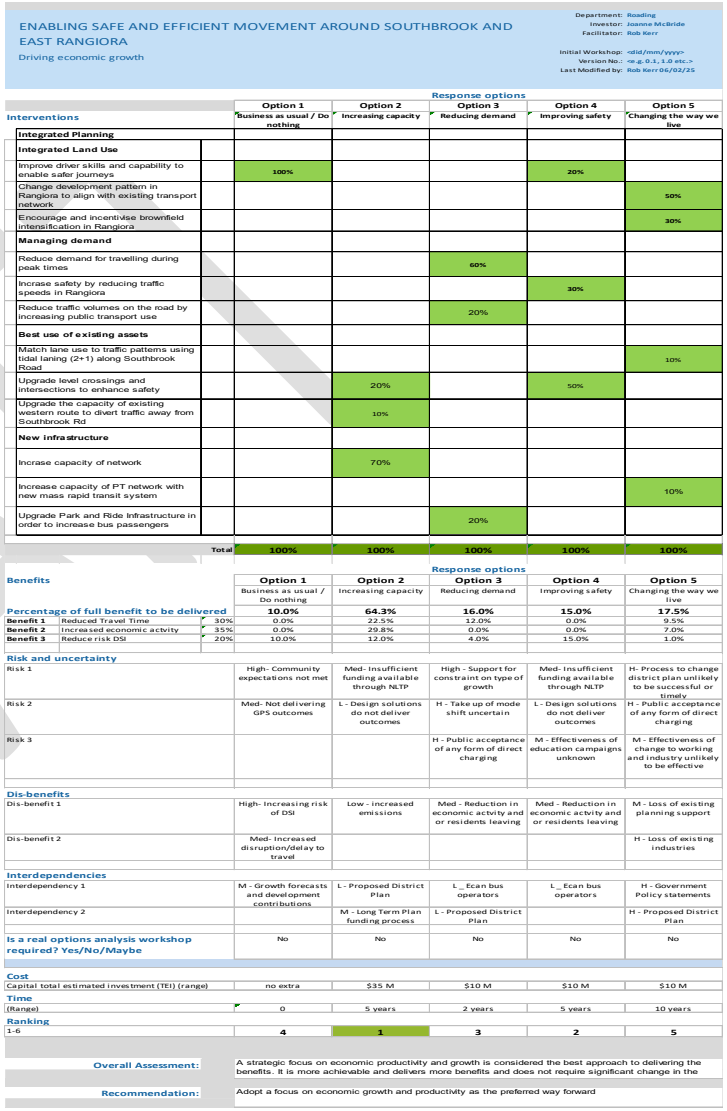
The analysis concludes that an emphasis on 'Driving economic productivity' is the preferred strategy to best deliver the benefits identified in the Strategic Case. This strategy involves:

- Matching pace of growth with availability of transport connections
- Improving safety at intersections and cycle facilities
- Increasing capacity of transport network in Rangiora
- Increasing capacity of connections to service new growth areas

The alternative approaches such as managing demand or focusing solely on safety improvements, is unlikely to address the key problems around congestion or unlocking land for housing and industry.

A more radical approach to adjust land use and employment patterns is considered inappropriate and not a realistic strategy.

It is noted that demand management and safety improvements are part of the Business as usual activities of the Council under the Transport Activity Management Plan and the Greater Christchurch PT Futures Business case and so subject to separate planning and funding processes.



ENABLING SAFE AND EFFICIENT MOVEMENT AROUND SOUTHBROOK AND EAST RANGIORA

Driving economic growth

Department: Roading
Investor: Joanne McBride
Facilitator: Rob Kerr
Initial Workshop: <dd/mm/yyyy>
Version No.: <e.g. 0.1, 1.0 etc.>
Last Modified by: Rob Kerr 06/02/25

Response options

Interventions	Option 1 Business as usual / Do nothing	Option 2 Increasing capacity	Option 3 Reducing demand	Option 4 Improving safety	Option 5 Changing the way we live
Integrated Planning					
Integrated Land Use					
Improve driver skills and capability to enable safer journeys	100%			20%	
Change development pattern in Rangiora to align with existing transport network					50%
Encourage and incentivise brownfield intensification in Rangiora					30%
Managing demand					
Reduce demand for travelling during peak times			60%		
Incrase safety by reducing traffic speeds in Rangiora				30%	
Reduce traffic volumes on the road by increasing public transport use			20%		
Best use of existing assets					
Match lane use to traffic patterns using tidal laning (2+1) along Southbrook Road					10%
Upgrade level crossings and intersections to enhance safety		20%		50%	
Upgrade the capacity of existing western route to divert traffic away from Southbrook Rd		10%			
New infrastructure					
Incrase capacity of network		70%			
Increase capacity of PT network with new mass rapid transit system					10%
Upgrade Park and Ride infrastructure in order to increase bus passengers			20%		
Total	100%	100%	100%	100%	100%

Response options

Benefits			Option 1 Business as usual / Do nothing	Option 2 Increasing capacity	Option 3 Reducing demand	Option 4 Improving safety	Option 5 Changing the way we live
Percentage of full benefit to be delivered			**10.0%**	**64.3%**	**16.0%**	**15.0%**	**17.5%**
Benefit 1	Reduced Travel Time	30%	0.0%	22.5%	12.0%	0.0%	9.5%
Benefit 2	Increased economic activity	35%	0.0%	29.8%	0.0%	0.0%	7.0%
Benefit 3	Reduce risk DSI	20%	10.0%	12.0%	4.0%	15.0%	1.0%
Risk and uncertainty							
Risk 1			High- Community expectations not met	Med- Insufficient funding available through NLTP	High - Support for constraint on type of growth	Med- Insufficient funding available through NLTP	H- Process to change district plan unlikely to be successful or timely
Risk 2			Med- Not delivering GPS outcomes	L - Design solutions do not deliver outcomes	H - Take up of mode shift uncertain	L - Design solutions do not deliver outcomes	H - Public acceptance of any form of direct charging
Risk 3					H - Public acceptance of any form of direct charging	M - Effectiveness of education campaigns unknown	M - Effectiveness of change to working and industry unlikely to be effective
Dis-benefits							
Dis-benefit 1			High- Increasing risk of DSI	Low - increased emissions	Med - Reduction in economic activity and or residents leaving	Med - Reduction in economic activity and or residents leaving	M - Loss of existing planning support
Dis-benefit 2			Med- Increased disruption/delay to travel				H - Loss of existing industries
Interdependencies							
Interdependency 1			M - Growth forecasts and development contributions	L - Proposed District Plan	L_ Ecan bus operators	L_ Ecan bus operators	H - Government Policy statements
Interdependency 2				M - Long Term Plan funding process	L - Proposed District Plan		H - Proposed District Plan
Is a real options analysis workshop required? Yes/No/Maybe			No	No	No	No	No
Cost							
Capital total estimated investment (TEI) (range)			no extra	$35 M	$10 M	$10 M	$10 M
Time							
(Range)			0	5 years	2 years	5 years	10 years
Ranking							
1-6			**4**	**1**	**3**	**2**	**5**

Overall Assessment:	A strategic focus on economic productivity and growth is considered the best approach to delivering the benefits. It is more achievable and delivers more benefits and does not require significant change in the
Recommendation:	Adopt a focus on economic growth and productivity as the preferred way forward

Sifting the Very Long List of new infrastructure options

The above preferred strategic response includes increasing the capacity of the transport network in Rangiora and to serve new growth areas. It also includes improving safety for cyclists and matching the pace of development.

Analysis of these options identified a very long list of options and these are shown in the table below. with key columns from the Early Assessment Sifting Tool (refer attachment XX for full EAST)

Intervention types	"Name of alternative/option"	Cost	Fatal flaws	Summary of decision made
Integrated planning	Change development pattern to align with existing network	$5-$50 million	Decisions already made. Mostly supports existing corridors now	Discontinue
Manage demand	Time of Use Charging	$5-$50 million	New technology in small town appears inappropriate but progress to test further	Progress
Manage demand	Congestion Charging	$5-$50 million	New technology in small town appears inappropriate	Discontinue
Best use of the existing system	Tidal laning (2+1)	$5-$50 million		Progress
Best use of the existing system	Four lane Southbrook Rd within existing road reserve	$5-$50 million		Progress
Best use of the existing system	Increase PT frequency	$1-$5 million	Unlikely to be effective in changing patterns	Discontinue
Best use of the existing system	Upgrade western route	$5-$50 million	Does not meet objective for East Rangiora growth	Discontinue
New infrastructure	Construct REL Sbk to Northbrook (West of WWTP)	$5-$50 million		Progress
New infrastructure	Construct REL Sbk to Northbrook (East of WWTP)	$5-$50 million		Progress

Intervention types	"Name of alternative/option"	Cost	Fatal flaws	Summary of decision made
New infrastructure	Construct REL Lineside to Northbrook	$5-$50 million		Progress
New infrastructure	Park and Ride upgrade	$1-$5 million	Unlikely to be effective in changing patterns	Discontinue
New infrastructure	Mass rapid transit	$50+ million	Unlikely to be effective in changing patterns sufficiently	Discontinue
New infrastructure	New western bypass	$50+ million	Does not meet objective for East Rangiora growth	Discontinue
New infrastructure	New eastern bypass - Fernside to Coldstream Rd	$5-50 million		Progress
New infrastructure	Widen and four lane Southbrook Rd			Progress

Assessment of Long List to determine Short List

Taking the long list from the previous section (Sifting), a Multi Criteria Assessment (MCA) was undertaken with rough order cost estimates with routes developed for each option. The map of each route is figure xx.

The full MCA is included as attachment XX, and the table below summarises the key findings.

The options were assessed against the

- Three investment objectives,
- Critical sucess factors, and
- Opportunities and Impacts

Observation from the assessment include:

- The cost of land acquisition and building demolition in order to widen Southbrook Road to 24m is both very high, very disruptive and will require significant use of compulsory acquisition powers in order to achieve which will be challenged and may be denied as there are viable alternatives.
- Time of Use Charging in a town would be expensive to establish and is likely to create significant community opposition, increasing the risk to delivery. It will also only be partially effective in delivering the investment objectives.
- Similarly, tidal flow laning of Southbrook Road is both very expensive to implement and carries a high delivery risk due to likely community opposition. It will also only be partially effective in delivering the investment objectives particular as

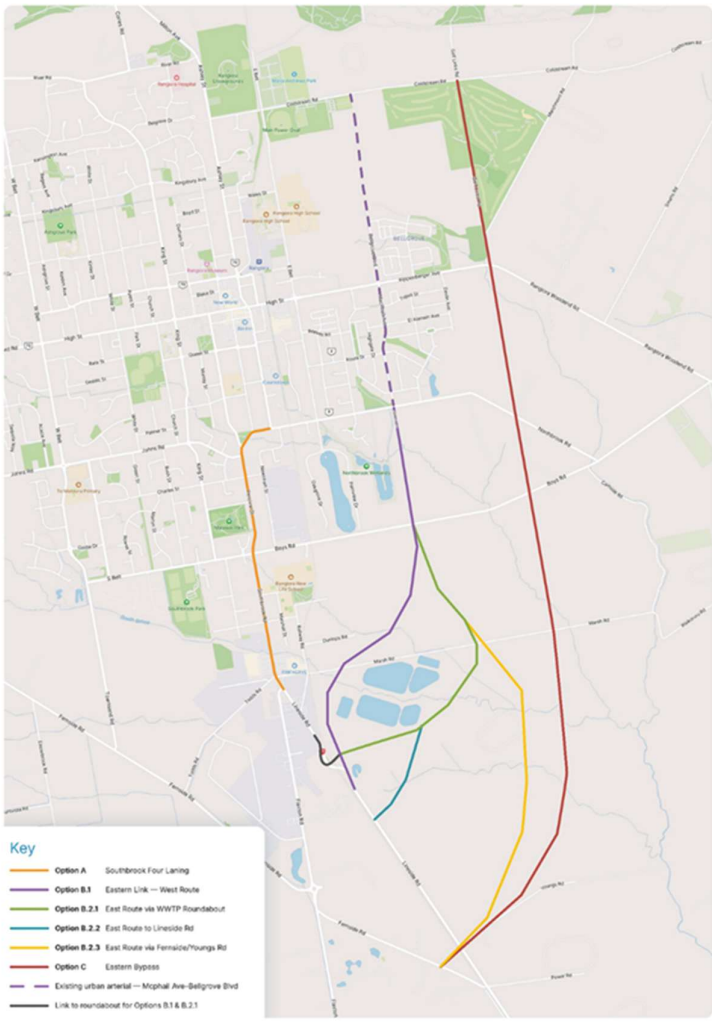


Figure 7 Long List of route options

evidence (reference required) is that crash rates increase by 30%.

- All the new routes to the east of the township score well in achieving the objectives, notwithstanding that all routes carry similar challenges in terms of ground conditions and watercourses.
- The routes that are outside the designation carry greater risk to delivery as a full consenting process and compulsory acquisition of the land will be required.
- The two options involving connection to Lineside Road at Fernside Road would assist in resolving a safety issue at the Fernside/Lineside intersection, but are materially more expensive and involve greater levels of land acquisition (and hence risk to delivery).
- The four laneing of Southbrook Road within the existing 20m road reserve is physically achievable and the lowest cost, however carries significant safety, severance and impacts on access to business and social destinations.

Options		RoC	Weighted score	Rank	Shortlist
DM	Do Minimum		0	4	Y
Southbrook Road					
A.1	Southbrook Four laning – within existing road reserve	$21.5 M	-0.68	6	Y
A.2	Southbrook Four laning – within wider road reserve	$38.9 M	-0.85	8	
A.3	Southbrook three laning – tidal flow 2+1 within existing road reserve	Not costed	-0.7	7	
A.4	Congestion charging / Time of Use	Not costed	-1.17	10	
Eastern Alignments					
B.1	Eastern Link - west route	$34.9M	1.1	1	Y
B.2.1	Eastern Link – east route to WWTP roundabout	$35.7M	0.98	2	Y
B.2.2	Eastern Link – east route to Lineside Rd	$32.9M	0.37	3	Y
B.2.3	Eastern Link – east route to Fernside/Youngs	$40.9M	-0.37	5	
C	Eastern Bypass	$44.6M	-0.97	9	

Sensitivity testing

To test the sensitivity of the assessment, the MCA was adjusted to weighted towards a) the investment objectives, or b) Economic productivity, or c) Social and Cultural impacts.

The results are shown in the table below. This shows

- the inclusion of the three variations on the Rangiora Eastern Link are not sensitive to the weightings of the MCA,
- The inclusion of four laning of Southbrook Road is somewhat sensitive to the weghtings.

			Base Ranking			What if Scenarios: if we weighted towards:					
						Investment Priorities		Economics		Social & Cultural	
	Options		Weighted scor	Rank	Shortlist	Weighted	Rank	Weighted	Rank	Weighted	Rank
DM	Do Minimum		0	4	Y						
	Southbrook Road										
A.1	Southbrook Four laning – within existing road reserve	$21.5 M	-0.68	6	Y	0.15	8	0.25	5	-1.35	7
A.2	Southbrook Four laning – within wider road reserve	$38.9 M	-0.85	8		0.35	6	0.25	5	-1.25	6
A.3	Southbrook three laning – tidal flow 2+1 within existing road reserve	-	-0.7	7		0.15	8	0.25	5	-1.14	3
A.4	Congestion charging / Time of Use	-	-1.17	10		0.35	6	-1	9	-1.24	5
	Eastern Alignments										
B.1	Eastern Link - west route	$34.9M	1.1	1	Y	3	1	1.75	1	-0.87	1
B.2.1	Eastern Link – east route to WWTP roundabout	$35.7M	0.98	2	Y	3	1	1.75	1	-0.87	1
B.2.2	Eastern Link – east route to Lineside Rd	$32.9M	0.37	3	Y	2.8	3	1.5	3	-1.18	4
B.2.3	Eastern Link – east route to Fernside/Youngs	$40.9M	-0.37	5		2.55	4	1	4	-2.04	8
C	Eastern Bypass	$44.6M	-0.97	9		2	5	0.25	5	-2.3	9

Selection of the Shortlist

The analysis dineries that the variations on an eastern link (options B.1 and B.2.x). all score the highest and are bought forward for more detailed assessment.

Option A.1 Southbrook Rd is being bought forward to the shortlist despite scoring lower than other eastern link options. The project team consider that it is important to continue to test this option as it forms a baseline to maximise the capacity of an existing asset, is a lower cost option and is sensitive to the weighting of the criteria.

As such, the preferred shortlist is:

- Do Minimum
- Option A.1 Four laning Southbrook Road witiin the existing road reserve
- Option B.1 Rangiora Eastern Link to Southbrook Road, West of the WWTP along the existing designation
- Option B.2.1 Rangiora Eastern Link to Southbrook Road, East of the WWTP outside the existing designation
- Option B.2.2 Rangiora Eastern Link to Lineside Road, East of the WWTP outside the existing designation

How do the shortlisted options stack up?

Understanding different view points

A drop-in session with Elected Members was held on 19th February. There was a range of views expressed at the session and written feedback received from 9 members only. Of those who provide written feedback, there was support for route directly to Lineside Road as well as the other options, with no support for four laning Southbrook Road. This is summarised in the table below:

	Option	Preferred	Support also	Oppose	Comment
A	Four laning Southbrook Rd				
B.1	REL, west of WWTP	2		1	Expected by community
B.2.1	REL, east of WWTP	2	2	1	
B.2.2	REL directly to Lineside Rd	4	1		Lowest cost
B.2.3	REL to Fernside Rd	1	3		Resolve issue at Fernside Rd also

The response from the neighbours along the southern boundary of the wastewater plant is varied, with three comfortable with all the routes (east or west of the plant), with one opposed to the eastern routes which would bring the road nearer to their property.

The Spark family, as landowners to the north of Marsh Road and to the east of the wastewater plant, support the eastern route options. This includes the better urban form created by an eastern route which leads to less impact on the farming operation and better support industrial land uses and future development to the east and allow creation of a more welcoming entrance centred around the values of the Southbrook and Middlebrook Streams.

Economic Modelling

An economic analysis[15] undertaken for the Rangiora Eastern Link (REL), aligning with the guidelines and procedures outlined in the Monetised Benefits and Cost Manual (MBCM, November 2024) and the Crash Estimation Compendium (CEC). Refer attachment xx.

Component	Option A (4-laning)	Option B1a (REL West)	Option B2.1 (REL East)	Option B2.2 (Lineside Rd)
TT Savings	$26.5	$227.7	$201.4	$218.0
VOC Savings	$39.9	$50.7	$48.5	$53.6
Active Modes	$3.8	$3.7	$4.1	$4.3
Safety	-	-	-	-
Total PV Benefits	$70.2	$282.0	$254.0	$276.0
Total PV Costs	$35.6	$58.2	$59.4	$54.8
Developer Contribution	$7.5	$24.7	$25.2	$23.2
BCR (National)	2.0	4.8	4.3	5.0
First Year Rate of Return (FYRR)	6%	5%	6%	3%

The key metrics for each shortlisted option are summarised in the table xx. Refer to appendix xx for more detailed information

[15] Rangiora Eastern Link - Economics Memorandum, Stantec, 12 March 2025

Traffic Modelling

Key findings from the traffic modelling undertaken to support this business case are outlined below with more detail in the appendices:

The shortlisted options all relieve the congestion on Southbrook Road

Route	AM Peak DM	AM Peak OptA	AM Peak OptB1a	AM Peak OptB21	AM Peak OptB22	PM Peak DM	PM Peak OptA	PM Peak OptB1a	PM Peak OptB21	PM Peak OptB22
2028										
Northbrook to Lineside SBD	4.8	3.5	4.0	4.0	4.0	4.3	3.3	4.0	4.0	4.0
Lineside to Northbrook NBD	4.1	3.2	3.7	3.7	3.7	5.3	3.7	4.6	4.7	4.6
Lineside Road SBD	6.2	6.5	6.6	6.6	6.7	5.7	6.0	6.0	6.0	6.1
Lineside Road NBD	5.2	5.4	5.5	5.4	5.6	7.3	8.6	8.0	7.9	7.9
Rangiora-Woodend EBD	8.3	8.3	8.3	8.3	8.3	8.4	8.5	8.5	8.4	8.4
Rangiora-Woodend WBD	8.6	8.6	8.6	8.6	8.6	8.9	8.8	8.8	8.8	8.8
Eastern Link SBD			6.1	6.3	6.5			6.0	6.3	6.5
Eastern Link NBD			5.8	6.1	6.2			5.9	6.2	6.4
2038										
Northbrook to Lineside SBD	7.4	3.8	4.0	4.1	4.0	4.3	3.3	3.9	3.9	3.9
Lineside to Northbrook NBD	4.2	3.4	3.7	3.8	3.7	6.5	4.7	5.0	4.9	4.8
Lineside Road SBD	6.8	7.6	8.6	8.5	8.6	5.7	5.9	6.1	6.0	6.2
Lineside Road NBD	5.2	5.4	5.5	5.5	5.7	7.8	8.4	9.0	8.7	8.8
Rangiora-Woodend EBD	11.6	9.4	8.8	8.8	8.8	8.8	8.9	8.8	8.8	8.8
Rangiora-Woodend WBD	9.0	8.9	8.8	8.8	8.8	10.2	9.7	9.7	9.6	9.6
Eastern Link SBD			7.0	7.0	7.4			6.5	6.7	6.9
Eastern Link NBD			6.1	6.4	6.6			6.4	6.7	6.9
2048										
Northbrook to Lineside SBD	10.7	4.3	4.2	4.3	4.2	4.5	3.4	3.9	3.9	3.8
Lineside to Northbrook NBD	4.4	3.4	3.9	3.9	3.8	7.2	5.9	5.5	5.2	5.2
Lineside Road SBD	6.9	9.0	11.0	10.4	10.7	5.9	6.1	6.5	6.3	6.5
Lineside Road NBD	5.2	5.5	5.6	5.5	5.7	9.2	10.0	10.8	10.1	10.3
Rangiora-Woodend EBD	14.9	12.0	10.9	10.4	10.5	9.1	9.1	9.1	9.1	9.1
Rangiora-Woodend WBD	9.4	9.4	9.1	9.0	9.0	12.5	11.9	11.5	10.7	10.7
Eastern Link SBD			7.2	7.2	7.5			6.8	6.9	7.1
Eastern Link NBD			6.1	6.4	6.6			6.5	6.7	6.9

All options will shift traffic away from Southbrook Road, rat running will reduce and better use is made of Flaxton Road

		Do Min	Opt A	Opt B.1a	Opt B.1a	Opt B.2.1	Opt B.2.2
2028							
Ivory Street	north of Northbrook Road	12,100	16,450	11,550	11,450	11,700	11,350
Percival St	north of South Belt	18,300	23,400	15,900	15,850	16,250	15,850
Southbrook Road	north of Station Road	23,400	28,050	20,400	20,300	20,750	20,150
Southbrook Road	at level crossing	17,600	20,550	15,250	12,700	14,550	13,350
SH71 Lineside Road	south of REL roundabout	17,600	20,550	19,250	18,800	18,800	18,150
Rangiora-Woodend Road	east of Golf Links Road	12,850	10,600	11,900	12,300	12,000	12,450
Fernside Road	south of Townsend Road	11,700	10,450	11,000	10,750	11,350	11,100
Flaxton Road	south of Lineside Road	6,800	7,950	7,250	7,850	7,400	7,950
2038							
Ivory Street	north of Northbrook Road	13,450	18,150	12,800	12,650	13,000	12,700
Percival St	north of South Belt	18,200	24,800	15,500	15,300	16,000	15,650
Southbrook Road	north of Station Road	22,550	28,900	19,800	19,400	20,050	19,600
Southbrook Road	at level crossing	16,250	20,800	14,700	11,250	13,650	12,650
SH71 Lineside Road	south of REL roundabout	16,250	20,800	20,700	18,550	20,050	19,800
Rangiora-Woodend Road	east of Golf Links Road	17,550	14,600	16,150	18,050	16,400	16,500
Fernside Road	south of Townsend Road	12,450	11,500	11,750	10,900	11,950	11,900
Flaxton Road	south of Lineside Road	6,700	8,350	8,000	8,750	8,150	8,500
2048							
Ivory Street	north of Northbrook Road	16,150	18,900	14,050	14,050	14,250	13,950
Percival St	north of South Belt	19,150	25,800	16,200	16,300	16,500	16,400
Southbrook Road	north of Station Road	23,950	30,300	20,450	20,300	20,400	20,100
Southbrook Road	at level crossing	18,300	21,600	15,200	12,700	14,200	13,100
SH71 Lineside Road	south of REL roundabout	18,300	21,600	21,550	21,300	20,900	20,750
Rangiora-Woodend Road	east of Golf Links Road	18,200	16,450	18,050	18,050	18,600	18,550
Fernside Road	south of Townsend Road	14,200	12,300	12,850	13,000	13,150	13,050
Flaxton Road	south of Lineside Road	6,700	8,800	8,250	8,550	8,150	8,600

Delays at intersections will be reduced materially, but still poor in some places

Intersection LOS for AM Peak	2038 Do Minimum Veh	Delay	LOS	Option A Veh	Delay	LOS	Option B.1a Veh	Delay	LOS	Option B.2.1 Veh	Delay	LOS	Option B.2.2 Veh	Delay	LOS
Ashley Street / Coldstream Road	1,058	13	B	1,133	15	B	1,169	11	B	1,122	12	B	1,120	11	B
Ashley Street / High Street	1,472	27	C	1,688	30	C	1,345	26	C	1,380	26	C	1,382	26	C
Ivory Street / Northbrook Road	1,566	91	F	1,686	24	C	1,392	29	D	1,421	30	D	1,424	29	D
Percival Street / Victoria Street	1,609	50	E	1,967	54	F	1,473	36	E	1,502	37	E	1,504	34	D
Percival Street / Johns Road	1,784	57	F	2,131	57	F	1,611	39	E	1,642	39	E	1,647	38	E
Percival Street / Charles Street	1,831	127	F	2,203	79	F	1,397	36	E	1,451	35	D	1,453	33	D
Southbrook Road / South Belt / Percival Street	2,066	56	E	2,837	44	D	2,007	30	C	2,016	30	C	2,016	28	C
Southbrook Road / Torlesse Street	1,944	31	C	2,424	6	A	1,631	6	A	1,611	6	A	1,615	6	A
Southbrook Road / Pak 'n Save supermarket	1,952	7	A	2,462	5	A	1,736	6	A	1,686	6	A	1,688	6	A
Lineside Road / Todds Road	1,828	113	F	2,282	10	A	1,499	41	E	1,587	48	E	1,589	44	E
Lineside Road / Flaxton Road	1,805	36	E	2,271	13	B	1,656	23	C	1,699	24	C	1,700	22	C
Coldstream Road / REL	583	8	A	549	8	A	762	10	A	685	9	A	681	10	A
Kippenberger Ave / MacPhail Ave	1,156	12	B	1,245	12	B	1,519	13	B	1,419	13	B	1,420	13	B
Northbrook Road / MacPhail Ave	954	12	B	811	10	A	1,490	12	B	1,171	11	B	1,173	12	B
REL / Boys Road	96	11	B	154	11	B	1,293	12	B	1,037	11	B	1,037	12	B
REL / Marsh Road	156			144			1,015	16	C	1,090	13	B	1,088	16	C
Lineside Road / REL	1,367			1,615			1,941	14	B	1,703	13	B	1,707	13	B

Multi Criteria Analysis

A cross-agency group of senior staff from Council. NZTA and Whitiora (on behalf of Ngai Tuahururi) assessed the short-listed options against a series of criteria.

This assessment is summarised in the following table, with more detailed information in appendix xx.

Type of Criteria	Criteria	Considerations	Option A: Four Laning Southbrook Road	Option B.1 : REL west of WWTP (designated route)	Option B.2.1 REL east of WWTP	Option B.2.2 REL east of WWTP to Lineside Rd
Investment Objectives	Improve accessibility from East Rangiora development area to SH1 by 3 minutes by 2038 (30%)	Measure 1: Travel time improvement from Area of East Rangiora greenfield land to SH1 (Lineside Road) Measure 2: Proportion of population living within 10 mins (am peak) of Southbrook Industrial Area (%) Measure 3: Reduce sideroad delays accessing Southbrook Road (secs)	2	2	2	2
	Reduce am peak travel time between Lineside and Northbrook Road by 40% by 2038 (55%)	Measure 1 Proportion of population within 10 mins of Southbrook Measure 2 Time to travel from Southbrook to Northbrook Road (Mins) Measure 3 Improvement in travel time reliability (comparing peak to inter-peak) (%)	2	2	2	2
	Improve the Infrastructure Risk Rating on strategic roads in South Rangiora to Medium or better by 2038 (15%)	Measure 1: Number of deaths and serious injuries Measure 2: Infrastructure risk rating > medium Measure 3: Ease for locals to cross the road (and access)	-2	2	2	1
Critical success factors	Affordability	Current budget is $35 million	-1	-2	-2	-2
	Deliverability (achievability)	Note advice in slide pack, Consenting, schedule, construction and land acquisition key risks	2	2	0	0
	Value for money	Economic metrics below	1	3	3	3
Opportunities and Impacts	Te ao Māori	Workshop deliberations	-1	-1	-1	-2
	Environment and ecology	Workshop deliberations	-1	-1	-1	-2
	Social and Landscape	Workshop deliberations	-3	1	1	1
	Private Property and immediate neighbours	Workshop deliberations	-3	2	0	-1
Economic indicators	Benefit Cost Ratio	Stantec Economic Assessment	2	4.8	4.3	5.0
	BCR (Govt)	Stantec Economic Assessment	2.2	7.7	6.7	8.0
	Net Present Value ($millions)	Stantec Economic Assessment	33.6	223.8	194.6	221.2
	First year rate of return	Stantec Economic Assessment	6%	5%	6%	3%
Cost	Capital Cost (P_{50}-P_{95})	Programme Manager	$21.5 -$31 M	34.9 - 52.4 M	$35.7 - 53.6M	$32.9 - 49.4 M
	Public sector cost (P50-P95)	Programme Manager	$5.4 - $7.75	$17.5 - 26.2 M	$17.9 - 26.8M	$16.5 - 14.7M
		Raw unweighted sum	-4	10	6	2
		Investment Oujectives (weighted)	1.5	2.1	2.1	1.95
		Critical Success Factors (unweighted)	2	3	1	1
		Opportunities and impacts (unweighted)	-6	5.8	3.3	-4
		Rank	4	1	2	3

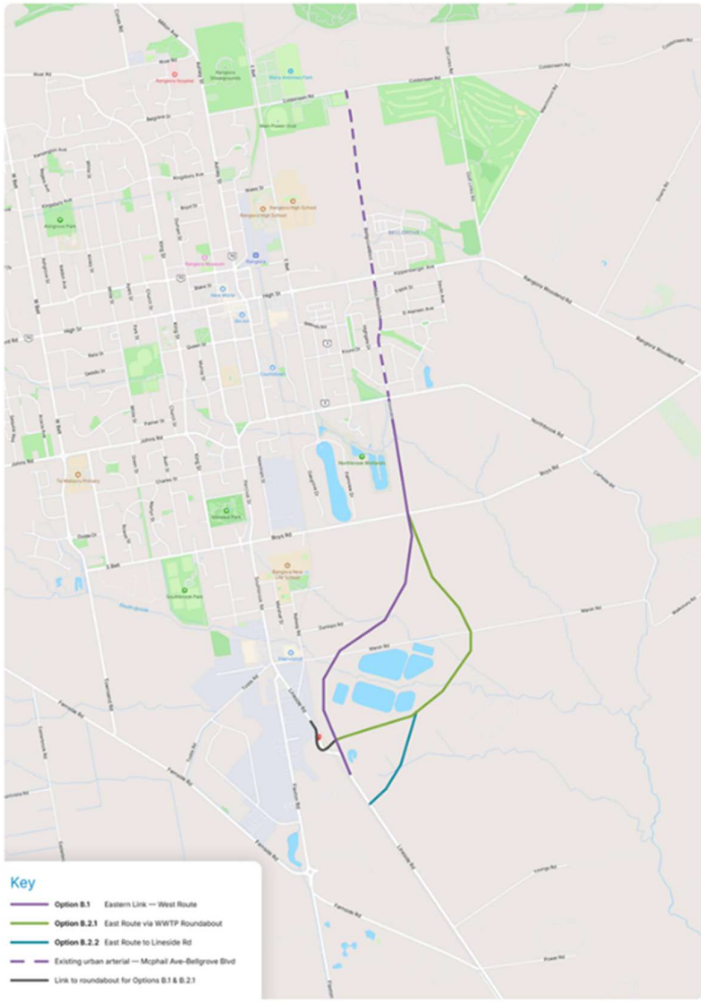


Figure 8 Short list of route options

Determining the preferred way forward

Discarding four laning of Southbrook Road

Option A: Four laning of Southbrook Rd is physically possible and would be able to be achieved within the existing road reserve. To assist understanding, this is similar to the design of Curletts Road in West Christchurch. However it does not deliver the full range of benefits and would result in increased severance, poor outcomes for cyclists, reduced accessibility for business and high risk for pedestrians, and particularly children crossing the road.

Despite Option A being the lowest cost option ($21 Million), it has a much lower benefit cost ratio (2.0) than the other options and hence is not considered to provide the value for money that investment in the REL would provide.

On that basis, this option is not considered further, and the remainder of this discussion focuses on the three shortlisted variations of the REL.

How well does each option achieve the objectives of relieving congestion, serving growth and improving safety

A Transport Assessment[16] with associated traffic modelling has been prepared for the project. This is included as an attachment along with a summary plan of the modelling outcomes. The analysis found that the Rangiora Eastern Link:

In summary, the analysis found that each of the shortlisted options provides good benefits in terms of travel time and reliability with some relatively minor variation in resulting traffic volumes and intersection delays. As such, the decision on which route to prefer should be based on the ability to deliver the project and the impact of each option.

Is the project likely to be funded and delivered?

Any project needs to be (1) affordable, (2) provide value for money, and (3) be able to be delivered. These are the critical success factors.

The three REL variation each have similar benefit cost ratios and total forecast costs and hence can be considered to provide value for money. Further, because they are similar to the current budget, they are affordable. Because 50% of funding is likely to come from development contributions, they each provide excellent value for money for public investment (ratepayer and taxpayer).

In terms of risks to delivery, a key difference between these options and the route to the west of the plant (along the designation in the proposed district plan) is the effect on people and property and related risk to delivery of the project.

Whereas the western route is distant from residential property and primarily passes through land owned by the Council or the Spark

[16] Rangiora Eastern Link Trasport Assessment of options, Stantec, March 2025

Family (with land likely rezoned), the eastern route passes immediately adjacent to several existing residential properties and, in the case of the route directly to Lineside Road, requires acquisition of land that has not previously been identified.

As noted above, one landowner opposes the eastern route, while all landowners are comfortable with the western route. The Spark Family prefer the eastern route and the landowner affected by the route directly to Lineside Road is likely to be a willing seller.

If Option B.1 is preferred, which follows the designation in the proposed District Plan, limited resource consents[17] are required, there is some distance to neighbours and land acquisition is more assured.

Conversely, a full consenting and land acquisition process will need to be advanced for work outside the destination. Further, the eastern route options pass close to existing homes and (for option B.2.2) require land acquisition on land not previously identified.

In other projects, this would be expected to raise the risk of drawn-out consenting and land acquisition processes that may not be successful due to the impact on neighbours and property owners. However, in this case, the feedback from neighbours indicates that there is support for all routes from most landowners, with one opposing.

Is there a difference in terms of impacts or opportunities?

The environmental impact and the impact on Te Ao Maori are similar across Options B.1 and B.2.1, with only the option B.2.2 (direct to Lineside Road) being scored lower due to crossing an additional high value waterway[18].

Option B.2.2 has a slightly lower safety score due to maintaining the existing level crossing rather than upgrading.

The two variations of eastern link that pass to the east of the wastewater plant offer benefits in terms of urban form as they open up more area immediately north of Marsh Road for industrial purposes (noting that land use is constrained due to proximity to the wastewater plant) and perhaps better support for any future urban expansion to the east.

While the western route passes through the existing operations area and would affect the pound, civil defence and water unit facilities, while eastern route would constrain the ability of the plant to be extended. As noted above, there is impact on the neighbours of the eastern route due to the proximity to homes, albeit that this is moderated somewhat by the support of some of these neighbours.

[17] An Outline Plan will need to be prepared and submitted, however provided that the proposal aligns with the notice of requirement then this is unlikely to be declined. Some consents may be required for the length of new road south of the dual roundabout (Lineside/Southbrook)

[18] South-Southbrook Stream

The Preferred way forward

It is fair to conclude that there are not strong reasons to prefer one shortlisted route option for the Rangiora Eastern Link over another. They each will deliver the transport benefits, provide value for money and are similar in cost. However there are differences between each option.

The two options which avoid crossing the South-Southbrook Stream to link directly to Lineside Road are slightly preferred as they lead to an upgraded level crossing, reduce impact on both the environment and Te Ao Maori and avoid the need to acquire and sever a large farm paddock.

The remaining two options (east or west of the wastewater plant) can be differentiated by the benefits to urban form provided by the eastern route and the lower risk to delivery provided by the western (designated) route.

If the impact on residential properties to the south of the wastewater plant and consequent risk to consenting requirements is considered to carry greater weight, them option B.1 West of WWTP would be preferred

If benefits to urban form and future development scenarios is weighted higher, then the route around the east of the wastewater pant would be preferred

With the designation in the Proposed District Plan, the benefits of the eastern route option would have to outweigh those of the designated route to be preferred. While there are real benefits to urban form of the eastern route, this is not sufficient to outweigh the impacts on people and property and subsequent risk to delivery. This is supported by the 10% lower benefit cost ratio (4.3) for the eastern route than the western route (4.8).

As such, option B.1 REL west of the Wastewater plant (designated route) is the preferred route.

What the solution will deliver

Rangiora grew up centred around a single north south strategic road (Southbrook Road).

This was sufficient when the town was small, but rapid growth over many decades has led to the development of a western route (Flaxton, Fernside. Merton/ Lehmans) which serves as heavy vehicle bypass and the residential growth in the west as well optimising the capacity of the single laned Southbrook Road.

The town will be mainly growing eastwards for the next decades, with up to 5,100 new homes enable by the Proposed District Plan. This rapid growth reflects the important role that the town plays in the greater Christchurch region and its status a Priority Development Area.

As any district grows, so must the infrastructure required to serve it, and the Council has developed an overall programme of physical and non-physical interventions to match the pace of that growth and ensure that the district keeps on moving.

The town has now reached a population and level of commercial activity where the bottleneck on Southbrook Road has become a drag on economic activity as well as making public and private transport unreliable and unattractive. Rail crossings which where tolerable when traffic volumes were low are becoming a greater risk to life, and this will be made substantially worse as the town grows further.

Modelling indicates very severe congestion will force traffic to take circuitous routes to minimise travel time, creating pressure on other parts of the network which were not built for it. The impact on the Southbrook Industrial Area will constrain freight movement and deter investment.

A solution that relieves the existing congestion and enable people and freight to move more quickly, as well as unlocks the land for housing is sought.

The preferred way forward involves creating a third north-south route through the town, spreading the traffic across multiple routes in order to improve travel time and reliability, improving safety and resilience and providing a connection to residential areas and industrial growth areas.

- Supports the growth of up to 5,000 new homes in East Rangiora
- Provides 3-4 minutes in shorter travel time from East Rangiora (300-400 veh. hours each day)
- Saves approximately 7,000 kms per day (VKT) in driving distance, leading to economic and emissions savings
- Reduces the traffic volume across Lineside Road level crossing down from 17,600 vpd to 14,000 per day
- Limits traffic volume to 19,200 vpd on Lineside Road instead of 23,000 vpd.
- And maintain a population of approximately 40,000 people within 10 minutes' drive of Southbrook and its employment and retail opportunities.

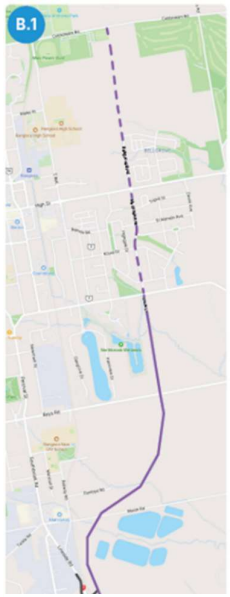
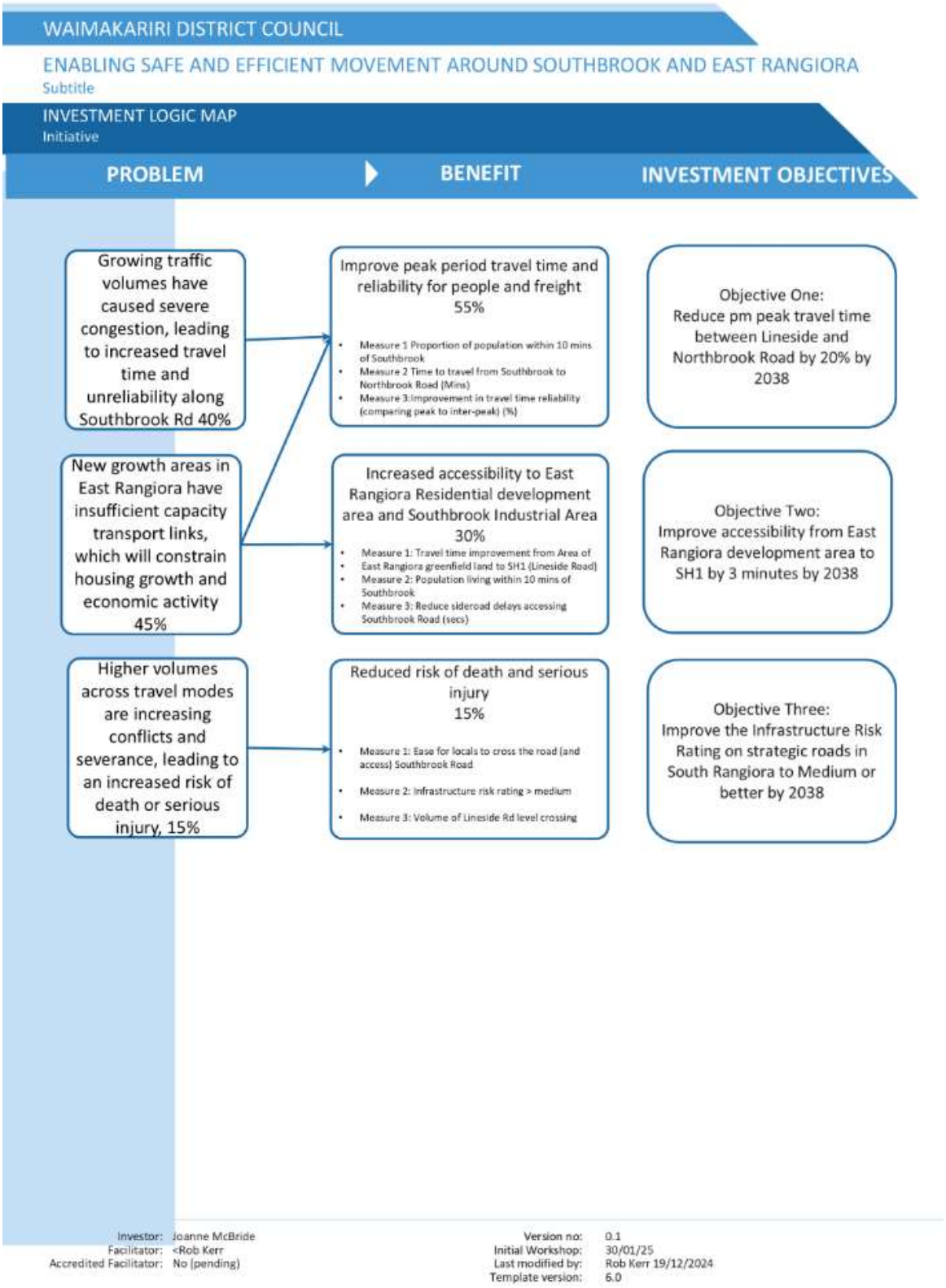
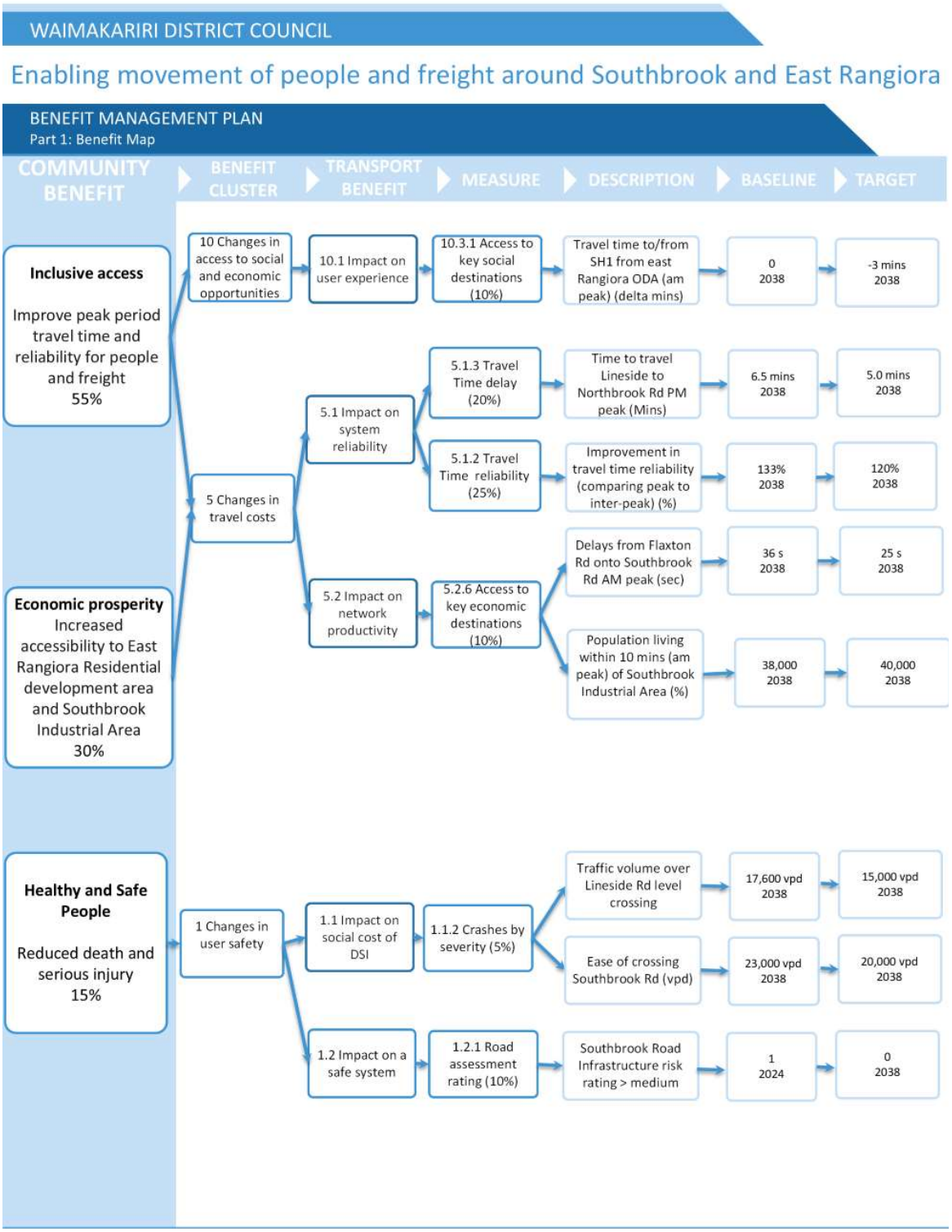


Figure 9 Reccomended route

Attachment A: Investment Logic Map



Attachment B: Investment Benefits Map



Investor: Joanne McBride
Facilitator: Rob Kerr
Accredited Facilitator: No (pending)

Version no: 0.1
Initial Workshop: 30/1/2025
Last modified by: Rob Kerr 19/12/2024
Template version: 6.0

Attachment C Detailed strategic alignment

The Government Transport Policy prioritises economic growth and productivity as the overarching mission for land transport.

The *New Zealand Government Policy Statement (GPS) on Land Transport 2024-34* outlines the strategic direction and funding priorities for the country's transport system over the next decade. The strategic priorities are:

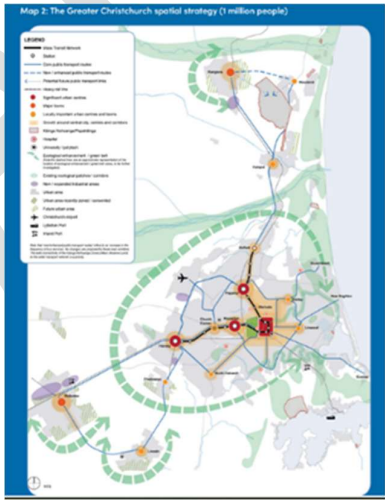
- *Economic Growth and Productivity*: Emphasising the importance of transport infrastructure in supporting economic development and productivity.
- *Increased Maintenance and Resilience*: Focusing on maintaining and enhancing the resilience of the transport network to withstand natural disasters and climate change.
- *Safety*: Aiming to reduce the number of deaths and serious injuries on New Zealand roads.
- *Value for Money:* Ensures that transport investments deliver the best possible outcomes for the money spent, with some emphasis on a 'no frills' perspective on project definition

The GPS says the major contribution that the transport sector can play in enhancing economic growth is by moving people and freight more quickly and unlocking land for housing.

There is a comprehensive set of plans to enable housing growth and economic development in Greater Christchurch

The *Greater Christchurch Spatial Plan* will help shape how Greater Christchurch grows as its population reaches more than 700,000 over the next 30 years and becomes home to possibly more than a million people in the decades that follow.

The Plan guides how greater Christchurch will accommodate new houses and businesses in a way that enhances the environment, integrates with transport and other infrastructure provision, builds greater community resilience against risks to natural hazards, and contributes to a sustainable future for Greater Christchurch.



Greater Christchurch – and the Waimakariri District - is thriving - and growing fast.

Over the past 15 years, Greater Christchurch has grown rapidly to a population of around half a million. By 2050, up to 700,000 people could be living in Greater Christchurch – 40% more than there are today, with the population potentially doubling to 1 million people in the future,[19]

Greater Christchurch is well placed for much greater population and economic growth. The latest projections from Stats NZ indicate Greater Christchurch's population could grow from a population of approximately half a million to around 700,000 by 2051.

The Greater Christchurch Spatial Plan anticipates steady growth in the Waimakariri District from the current population of 67,900 to around 82,000 by 2033, and in the order of 102,000 by 2052. Up to 15,000 additional homes are expected to be required to accommodate population change over the next 30 years.

If Greater Christchurch was to grow at the rate seen over the last 15 years, then it could reach a population of 700,000 within the next 30 years and in time one million, doubling the size of today's population.

Canterbury's priorities for transport investment are about economic growth, safety and resilience coupled with promoting more sustainable transport modes.

The *Canterbury Regional Land Transport Plan (CRLTP) 2024-34* outlines the strategic direction for land transport planning and investment in the Canterbury region over the next decade. The objectives are:

- *Sustainable Transport*: Promotes the use of sustainable transport modes to reduce emissions and environmental impact.
- *Safety*: Aims to reduce deaths and serious injuries on the roads.
- *Resilience*: Enhances the resilience of the transport network to withstand natural disasters and climate change.
- *Economic Growth:* Supports economic development through efficient and reliable transport infrastructure.

The Rangiora Eastern Link is a Regionally Significant Project in the Canterbury RLTP. Ranked 25 for addressing congestion and access issues along Southbrook Road, materially reducing travel time, and unlocking access to greenfield development land.

[19] Greater Christchurch Spatial Plan, 2023

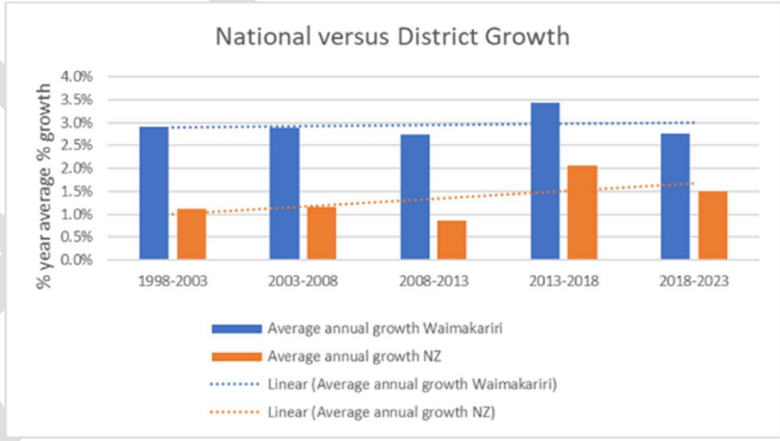
The major transport challenges for Canterbury are rapid population growth with growing urban boundaries while maintaining efficient freight routes and adapting to a changing climate.

Waimakariri District is growing fast and is a critical part of greater Christchurch

The Waimakariri district was one of the five fastest growing (measured as a percentage growth rate) local authorities in New Zealand in seven of the ten years between 2007 and 2016. At the 2018 census growth was 3.81%. In 2019, the national ranking dropped to 11th[th,] and growth now sits at around an estimated 2.7%, (67900-69,760) compared with an average estimated growth rate for New Zealand of 2.3% (5117100-5236300), from 2022-2023[20].

Rangiora plays a significant role in the urban form of Greater Christchurch, contributing to the region's economic, social, and infrastructural landscape. It is one of Greater Christchurch's Key Activity Centres which highlights its importance in clustering community, retail, residential, and business activities.

The town is well-connected to Christchurch via major transport routes,



including State Highway 1 with improved public transport options between Rangiora and Christchurch, reducing reliance on private vehicles and promoting sustainable transport. It is the largest centre in one of the fastest growing districts in New Zealand and has experienced significant economic growth and development in recent years.

While 41%[21] of spending by residents is outside the district (i.e. retail leakage) is not good news for local business, it reminds us of the strong

[20] Transport Asset Management Plan 2024 (WDC, 2024)

[21] Waimakariri Economic Development Strategy, 2024).

connection between Christchurch and the Waimakariri. The district also provides jobs for around 7% of Greater Christchurch's labour, the proximity to Christchurch provides an important way for businesses to access and attract skilled labour.

Rangiora is a Priority Development Area for growth and economic development in greater Christchurch

A strengthened network of urban and town centres is one of the five key moves identified in the *Greater Christchurch Spatial Plan* and, through Priority Development Areas, provide the opportunity to accelerate development in locations that support the desired pattern of growth.

Rangiora is one of these areas and the Plan supports the growth of Rangiora by:

1. **Intensification and Development**: Encouraging higher density residential and commercial development around Rangiora's town centre while retaining its character.
2. **Transport Connectivity**: Improving public transport connections to enhance accessibility and reduce reliance on private vehicles.
3. **Economic Hub**: Recognizing Rangiora as a key service and employment centre for surrounding areas, providing a mature offering of employment, retail, and community facilities.
4. **Infrastructure Investment**: Ensuring that infrastructure is planned and developed to support the anticipated growth and maintain the quality of life for residents.

Identifying Rangiora as a Priority Development Area means coordinated efforts and investments will be focused to accelerate and support significant growth.

The Proposed Waimakariri District Plan enables significant growth in East Rangiora

The Proposed Waimakariri District Plan is expected to be made operative in late 2025 (update when this BC finalised and add a plan of the ODPs). Its sets out areas for future growth in housing as well as protecting existing and proposed road corridors. Specifically for Rangiora, it includes:

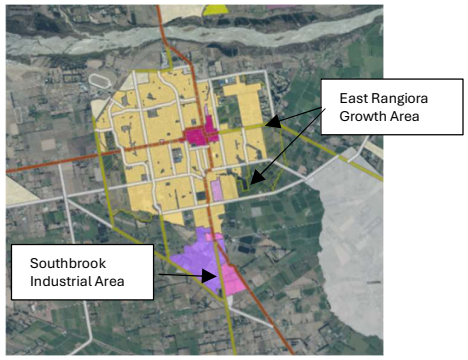


Figure 10 Proposed District Plan Zones

- Approximately 615 ha of new greenfield land for residential development is rezoned
- This includes East Rangiora, with over 5,000 new lots, forecast to see a doubling in population over the next 30 years.
- A designation for the proposed route of the Rangiora Eastern Link.

The (Proposed) District Plan enables further extensive residential development in East Rangiora and a new eastern arterial to service growth areas and address congestion

Figure 11: East Rangiora Outline Development Plan

The Council's Integrated Transport Strategy seeks to ensure the impacts of growth do not hinder reliable and efficient movement of freight

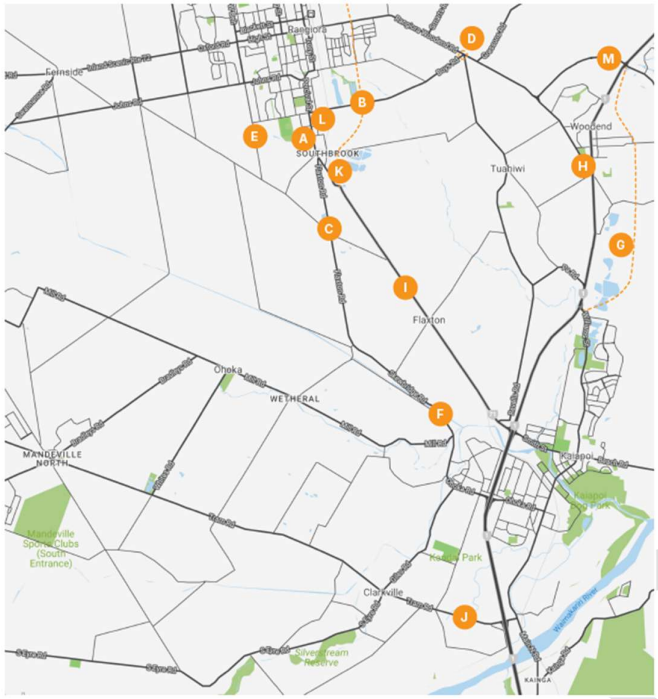
This strategy, and the underlying Transport Asset Management Plan, seeks to a preferred freight route that bypasses Rangiora and Kaiapoi town centres and manages freight movements (e.g. safe stopping point locations) with destinations within our townships.

Along with other objectives, it also seeks to better connect the industrial areas and freight hubs to the arterial network and looks to upgrade strategic freight routes that service rural areas for primary industries.

The Integrated Transport Strategy supports greenfield expansion where the development will improve transport outcomes or is enabled by good multi-modal transport linkages.

The Council and Waka Kotaki NZTA have a programme of work across the east of the district to enable growth and remove constraints on efficient movement of freight and people

This package of projects is centred around the nodes of Kaiapoi, Woodend and Rangiora, and address the impacts of an increasing traffic volume that is inherent from a growing population and economic base. These projects are shown on the plan to the right and demonstrate the significant investment and long term strategic planning behind the management of the transport network in the district.



The Council has been planning to address congestion and enable growth for over two decades

The concept of an eastern link was first identified in 2001, and planning for growth has been long standing through various iterations of structure plans, district plans and outline development plans.

During intervening years there has been continued to be substantial growth which is exacerbating congestion along Southbrook Road.

The 2001 Rangiora Transport Study (Beca) identified a range of existing and future deficiencies in the transport network. The greatest issue identified was the increasing congestion on the Rangiora North-South strategic route. Also noted was the impact of housing growth, safety at the railway level crossings and the rural/urban fringe and the need for more direct bus routes.

This study identified an eastern link road from Southbrook to the east of town as the second highest priority project after interim traffic signal improvements on the north-south route. In 2005, Opus (now WSP) completed a Scheme Assessment of a new road, called the Rangiora Eastern Link.

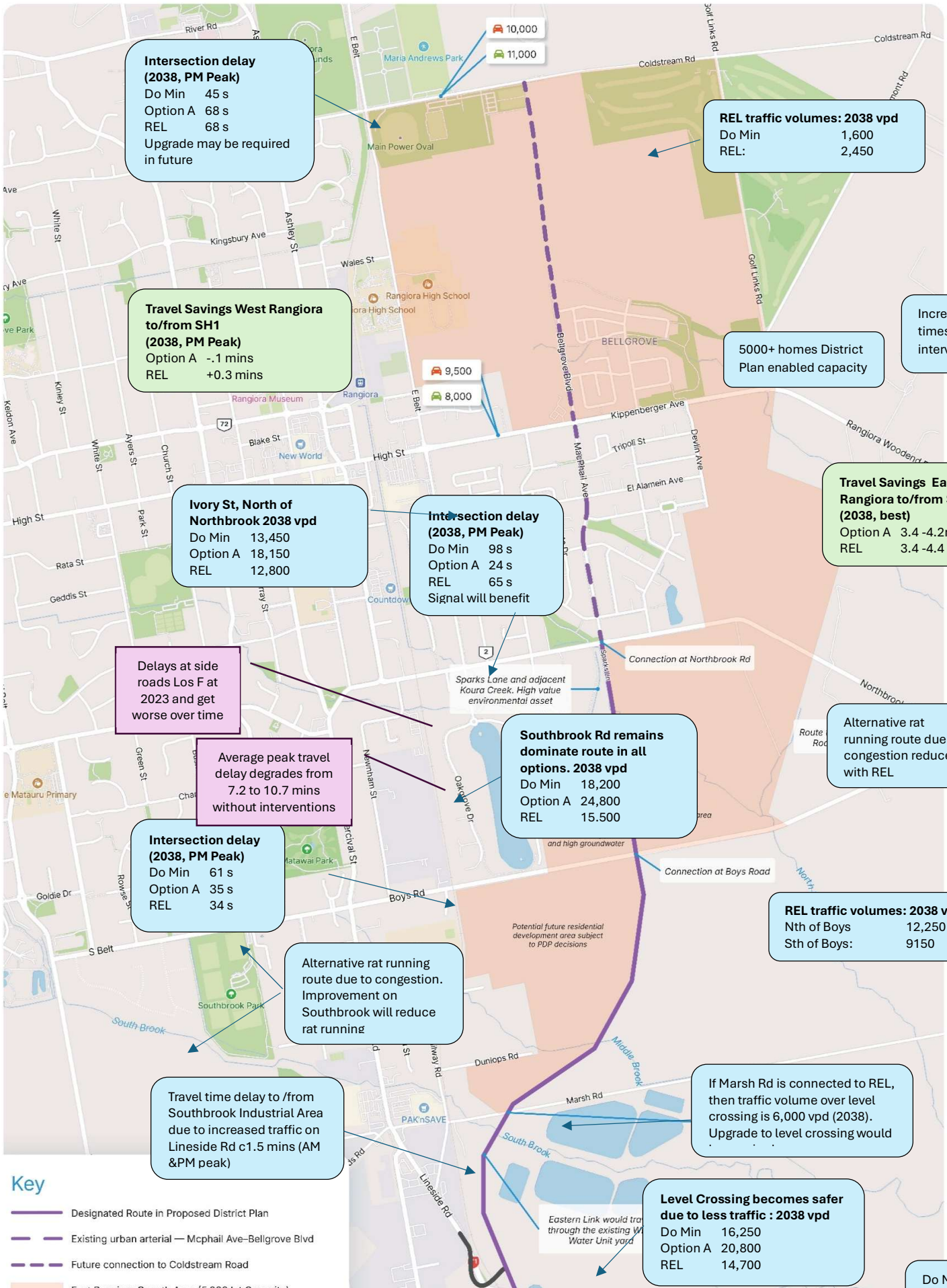
In 2021, further technical work was undertaken to support a Notice of Requirement to include the route of the road as a designation in the Proposed District Plan. This designation became operative in xxx 2025.

The proposed Eastern Link was included in the Canterbury Land Transport Plan (2024-2034) and co-funding for this business case work was included in the National land Transport Plan (2024-2034).

Council has leveraged the land development on the east side of town to progressively advance development of the eastern link between Northbrook Road and Coldstream Road. Through major developments such as Belgrove, 35% of the road has already been constructed, with a further 15% to be completed in future subdivision processes, with contributions levied towards the section south of Northbrook Road.

This Business Case is revisiting the Problems, clarifying the Investment Objectives and confirming the best way to achieve these outcomes.

Attachment D Summary of traffic modelling


10,000
11,000
9,500
8,000
Intersection delay (2038, PM Peak)
Do Min 45 s
Option A 68 s
REL 68 s
Upgrade may be required in future
REL traffic volumes: 2038 vpd
Do Min 1,600
REL: 2,450
Travel Savings West Rangiora to/from SH1 (2038, PM Peak)
Option A -.1 mins
REL +0.3 mins
5000+ homes District Plan enabled capacity
Increasing travel times without intervention
Travel Savings East Rangiora to/from SH1 (2038, best)
Option A 3.4 -4.2mins
REL 3.4 -4.4 mins
Ivory St, North of Northbrook 2038 vpd
Do Min 13,450
Option A 18,150
REL 12,800
Intersection delay (2038, PM Peak)
Do Min 98 s
Option A 24 s
REL 65 s
Signal will benefit
Delays at side roads Los F at 2023 and get worse over time
Average peak travel delay degrades from 7.2 to 10.7 mins without interventions
Southbrook Rd remains dominate route in all options. 2038 vpd
Do Min 18,200
Option A 24,800
REL 15.500
Alternative rat running route due to congestion reduced with REL
Intersection delay (2038, PM Peak)
Do Min 61 s
Option A 35 s
REL 34 s
REL traffic volumes: 2038 vpd
Nth of Boys 12,250
Sth of Boys: 9150
Alternative rat running route due to congestion. Improvement on Southbrook will reduce rat running
Travel time delay to /from Southbrook Industrial Area due to increased traffic on Lineside Rd c1.5 mins (AM &PM peak)
If Marsh Rd is connected to REL, then traffic volume over level crossing is 6,000 vpd (2038). Upgrade to level crossing would
Level Crossing becomes safer due to less traffic : 2038 vpd
Do Min 16,250
Option A 20,800
REL 14,700
Do Minimum
Key
Designated Route in Proposed District Plan
Existing urban arterial — Mcphail Ave–Bellgrove Blvd
Future connection to Coldstream Road
Connection at Northbrook Rd
Connection at Boys Road
Sparks Lane and adjacent Koura Creek. High value environmental asset
Potential future residential development area subject to PDP decisions
Eastern Link would tra through the existing W Water Unit yard
River Rd
Coldstream Rd
Maria Andrews Park
Main Power Oval
Kingsbury Ave
Wales St
Rangiora High School
Rangiora Museum
Rangiora
BELLGROVE
Bellgrove Blvd
MacPhail Ave
Kippenberger Ave
Tripoli St
El Alamein Ave
Devlin Ave
Blake St
New World
High St
Rata St
Geddis St
Countdown
Golf Links Rd
White St
Ashley St
Kinley St
Ayers St
Church St
Park St
Green St
Newnham St
Oakgrove Dr
Matawai Park
Goldie Dr
Boys Rd
S Belt
Southbrook Park
South Brook
Dunlops Rd
Middle Brook
Marsh Rd
PAK'nSAVE
Lineside Rd
Northbrook
Matauru Primary

Attachment E Transport Assessment of Options

Bound separately Trim Ref

Attachment F: Economic Modelling

Bound separately Trim Ref

Attachment G: Early Assessment Sifting Tool

Early Assessment Sifting Tool template

Early Assessment Sifting Tool: Excel template

The Early Assessment Sifting Tool (EAST) supports an initial coarse screening of alternatives and options. The EAST is designed to quickly and robustly rule out alternatives and options, allowing for a more manageable subsequent multi-criteria analysis exercise.

Project overview

Date:	19/12/2024	**Business case phase:**	Single stage business case	**Do-minimum:**	Current scope of Long Term Plan projects
Project name:	Rangiora Eastern Link	**Problem/opportunity stat**	Enabling free movement of goods and people in South and East Rangiora		

Investment objective:	Reduce congestion along Southbrook Road to level of Service C or better
Investment objective:	Provide transport connections to enable development of 5,000 lots in East Rangiora
Investment objective:	Improve safety of network to IRR rating of medium or better

Note: Please copy the row above to add an additional investment objective.

Alternative or option details			Investment objective			Practical feasibility			Scheduling/ programming	Cost	Key risks and uncertainties	Impacts on te ao Māori	Environmental and social responsibility		Fatal flaws	Other impacts		Summary of decision made	
Intervention types sourced from the intervention hierarchy	Unique identifier	Name of alternative/option	Reduce congestion along Southbrook Road to level of Service C or better	Provide transport connections to enable development of 5,000 lots in East Rangiora	Improve safety of network to IRR rating of medium or better	Technical	Safety and design	Consentability					Identify	Mitigation Can these be avoided, remedied or mitigated?				Summary of decision made	Progress or discontinue this alternative/ option?
Integrated planning	1	Change development pattern to align with existing network	1. Low	3	1. Low	5. Red (difficult/complex)	1. Green	5. Red (difficult/complex)	5+ years	$5-$50 million	Partially achieved. Ten years to next PDP	Role Greater Chch partnership agreements	Urban form forced by existing network	User to describe...	Decisions already made. Mostly supports existing corridors now	User to describe...		Discontinue	
Manage demand	2	Time of Use Charging	3	1. Low	2	5. Red (difficult/complex)	5. Red (difficult/complex)	3.Amber	5+ years	$5-$50 million	Social licence and implementation	unknown	Impact on low income travellers	Alternative longer route	New technology in s small town appears inappropriate	User to describe...		Progress	
Manage demand	3	Congestion Charging	3	1. Low	2	5. Red (difficult/complex)	5. Red (difficult/complex)	4.Red/amber	5+ years	$5-$50 million	Social licence and implementation	unknown	Impact on low income travellers	Alternative longer route	New technology in s small town appears inappropriate	User to describe...		Discontinue	
Best use of the existing system	4	Tidal laning (2+1)	3	3	1. Low	3.Amber	4.Red/amber	3.Amber	2-5 years	$5-$50 million	Social licence and implementation	unknown	Nil material			User to describe...		Progress	
Best use of the existing system	5	Four lane Southbrook Rd within existing road reserve	5. High	3	2	1. Green	2.Amber/green	2.Amber/green	2-5 years	$5-$50 million	Community adverse response	unknown	Nil material			User to describe...		Progress	
Best use of the existing system	6	Increase PT frequency	2	2	1. Low	1. Green	1. Green	1. Green	5+ years	$1-$5 million	Funding	unknown	Nil material		Unlikely to be effective in changing patterns	User to describe...		Discontinue	
Best use of the existing system	7	Upgrade western route	1. Low	1. Low	1. Low	1. Green	1. Green	1. Green	2-5 years	$5-$50 million	Limited risk	unknown	Nil material		Does not meet objective for East Rangiora growth	User to describe...		Discontinue	
New infrastructure	8	Construct REL Sbk to Northbrook (West of WWTP)	5. High	5. High	4	2.Amber/green	1. Green	2.Amber/green	2-5 years	$5-$50 million	Normal risk profile. Land acquisition	High value water resources	Waterways	Good design and restoration		User to describe...		Progress	
New infrastructure	9	Construct REL Sbk to Northbrook (East of WWTP)	5. High	5. High	4	2.Amber/green	1. Green	2.Amber/green	2-5 years	$5-$50 million	Normal risk profile. Land acquisition	High value water resources	Waterways	Good design and restoration		User to describe...		Progress	
New infrastructure	10	Construct REL Lineside to Northbrook	5. High	5. High	4	2.Amber/green	1. Green	2.Amber/green	2-5 years	$5-$50 million	Normal risk profile. Land acquisition	High value water resources	Waterways	Good design and restoration		User to describe...		Progress	
New infrastructure	11	Park and Ride upgrade	1. Low	1. Low	1. Low	2.Amber/green	1. Green	2.Amber/green	2-5 years	$1-$5 million	Effectiveness	Unknown	Nil material		Unlikely to be effective in changing patterns	User to describe...		Discontinue	
New infrastructure	12	Mass rapid transit	2	2	1. Low	5. Red (difficult/complex)	3.Amber	3.Amber	5+ years	$50+ million	Funding and delivery	Unknown	Unknown		Unlikely to be effective in changing patterns sufficiently	User to describe...		Discontinue	
New infrastructure	13	New western bypass	2	1. Low	1. Low	1. Green	1. Green	2.Amber/green	5+ years	$50+ million	Landowner and funding	High value water resources	Waterways	Good design and restoration	Does not meet objective for East Rangiora growth	User to describe...		Discontinue	
New infrastructure	14	New eastern bypass - Fernside to Coldstream Rd	5. High	5. High	4	1. Green	1. Green	2.Amber/green	5+ years	$5-$50 million	Landowner and funding	High value water resources	Waterways	Good design and restoration		User to describe...		Progress	
New infrastructure	15	Widen and four lane Southbrook Rd	5. High	5. High	4	1. Green	1. Green	3.Amber	5+ years	$5-$50 million	Community adverse response	unknown	Private impact	Purpose of built and improved private land		User to describe...		Progress	

Note: Please copy the row above to add a new alternative or option

Attachment H: Long List Multi Criteria Assessment

	Criteria		Likely Investment Objectives			Critical success factors				Opportunities and Impacts			Base Ranking			What if Scenarios: If we weighted towards:					
			33%			33%				33%						Investment Priorities		Economics		Social & Cultural	
			Unlocks land for	Reduces travel	Improves safety	Affordability	Risk to delivery	Value for money	Resilience	Environment and	Social and Landscape	People & Property									
			45%	45%	10%	35%	35%	30%	5%	40%	30%	30%									
	Options		15%	15%	3%	12%	12%	10%	2%	13%	10%	10%	Weighted score	Rank	Shortlist	Weighted	Rank	Weighted	Rank	Weighted	Rank
DM	Do Minimum		0	0	0	0	0	0	0	0	0	0	0	4	Y						
	Southbrook Road																				
A.1	Southbrook Four laning – within existing road reserve	$21.5 M	0	1	-3	-1	-2	1	1	0	-2	-3	-0.68	6		0.15	8	0.25	5	-1.35	7
A.2	Southbrook Four laning – within wider road reserve	$38.9 M	0	1	-1	-2	-3	1	1	0	-2	-3	-0.85	8		0.35	6	0.25	5	-1.25	6
A.3	Southbrook three laning – tidal flow 2+1 within existing road reserve	-	0	1	-3	-1	-3	1	1	0	-2	-2	-0.7	7		0.15	8	0.25	5	-1.14	3
A.4	Congestion charging / Time of Use	-	0	1	-1	-2	-3	-3	0	0	-3	-1	-1.17	10		0.35	6	-1	9	-1.24	5
	Eastern Alignments																				
B.1	Eastern Link - west route	$34.9M	3	3	3	-2	3	3	3	-2	0	-1	1.1	1	Y	3	1	1.75	1	-0.87	1
B.2.1	Eastern Link – east route to WWTP roundabout	$35.7M	3	3	3	-2	2	3	3	-2	0	-1	0.98	2	Y	3	1	1.75	1	-0.87	1
B.2.2	Eastern Link – east route to Lineside Rd	$32.9M	3	3	1	-2	-1	2	3	-2	0	-2	0.37	3	Y	2.8	3	1.5	3	-1.18	4
B.2.3	Eastern Link – east route to Fernside/Youngs	$40.9M	3	2	3	-2	-2	1	3	-3	-3	-2	-0.37	5		2.55	4	1	4	-2.04	8
C	Eastern Bypass	$44.6M	2	2	2	-2	-3	-1	3	-3	-3	-3	-0.97	9		2	5	0.25	5	-2.3	9

Attachment I: Multi Criteria Shortlist Assessment

Type of Criteria	Criteria	Considerations	Option A: Four Laning Southbrook Road	Option B.1 : REL west of WWTP (designated route)	Option B.2.1 REL east of WWTP	Option B.2.2 REL east of WWTP to Lineside Rd
Investment Objectives	Improve accessibility from East Rangiora development area to SH1 by 3 minutes by 2038 (30%)	Measure 1: Travel time improvement from Area of East Rangiora greenfield land to SH1 (Lineside Road) Measure 2: Proportion of population living within 10 mins (am peak) of Southbrook Industrial Area (%) Measure 3: Reduce sideroad delays accessing Southbrook Road (secs)	2	2	2	2
	Reduce am peak travel time between Lineside and Northbrook Road by 40% by 2038 (55%)	Measure 1 Proportion of population within 10 mins of Southbrook Measure 2 Time to travel from Southbrook to Northbrook Road (Mins) Measure 3:Improvement in travel time reliability (comparing peak to inter-peak) (%)	2	2	2	2
	Improve the Infrastructure Risk Rating on strategic roads in South Rangiora to Medium or better by 2038 (15%)	Measure 1: Number of deaths and serious injuries Measure 2: Infrastructure risk rating > medium Measure 3: Ease for locals to cross the road (and access)	-2	2	2	1
Critical success factors	Affordability	Current budget is $35 million	-1	-2	-2	-2
	Deliverability (achievability)	Note advice in slide pack, Consenting, schedule, construction and land acqusition key risks	2	2	0	0
	Value for money	Economic metrics below	1	3	3	3
Opportunities and Impacts	Te ao Māori	Workshop deliberations	-1	-1	-1	-2
	Environment and ecology	Workshop deliberations	-1	-1	-1	-2
	Social and Landscape	Workshop deliberations	-3	1	1	1
	Private Property and immediate neighbours	Workshop deliberations	-3	2	0	-1
Economic indicators	Benefit Cost Ratio	Stantec Economic Assessment	2	4.8	4.3	5.0
	BCR (Govt)	Stantec Economic Assessment	2.2	7.7	6.7	8.0
	Net Present Value ($millions)	Stantec Economic Assessment	33.6	223.8	194.6	221.2
	First year rate of return	Stantec Economic Assessment	6%	5%	6%	3%
Cost	Capital Cost (P_{50}-P_{95})	Programme Manager	$21.5 -$31M	34.9- 52.4 M	$35.7 - 53.6M	$32.9 - 49.4 M
	Public sector cost (P50-P95)	Programme Manager	$5.4 - $7.75	$17.5 - 26.2 M	$17.9 - 26.8M	$16.5 - 14.7M
		Raw unweighted sum	-4	10	6	2
		Investment Ovjectives (weighted)	1.5	2.1	2.1	1.95
		Critical Success Factors (unweighted)	2	3	1	1
		Opportunities and impacts (unweighted)	-6	5.8	3.3	-4
		Rank	4	1	2	3