Plan Change 73: Rolleston West Residential Ltd

Transportation Hearing Report

September 2021

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TRANSPORTATION SPECIALISTS

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Project: **Plan Change 73: Rolleston West Residential Ltd**
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Reviewed by: **Ian Clark**

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SUMMARY OF MY PEER REVIEW

Selwyn District Council (Council) has requested Flow Transportation Specialists (Flow) to review the transportation matters associated with Private Plan Change 73 (PPC73), which has been lodged by Rolleston West Residential Ltd. As part of my review, I have considered the cumulative transport effects of seven additional private plan changes (PPCs) within Rolleston, being

- PPC64: Rolleston, 969 residential lots
- PPC66: Rolleston, rural zone to industrial zone
- PPC70: Rolleston, 800 residential lots plus commercial
- PPC71: Rolleston, 660 residential lots
- PPC73: Rolleston, 2100 residential lots plus commercial
- PPC75: Rolleston, 280 residential lots
- PPC76: Rolleston, 150 residential lots
- PPC78: Rolleston, 750 residential lots.

This report focuses on my review of PPC73, however I include comments on the cumulative effect of the additional seven PPCs to assist Council's understanding of the potential future effects on the transport network should all PPCs be approved.

Key transport matters identified in my review

- The cumulative effect of the 8 PPCs on the Rolleston transport network, and the proportional effect of PPC73
- The safety and efficiency effects of PPC73 on key intersections, and what intersection and road upgrades are required to support PPC73
- Connectivity of the Outline Development Plans within each site, and to the adjacent existing and future transport network
- Consideration of the Rolleston Structure Plan
- Recommended amendments to the Outline Development Plans.

In terms of the immediate effects of PPC73 and the proposed ODPs

- To mitigate congestion effects at the Dunns Crossing Road/Newmans Road/Holmes Block Access Road intersection, the ITA proposes an intersection form that may not meet Council's Engineering Standards, and may result in more than minor safety and efficiency effects for road users. I consider that PPC73 has not demonstrated that the proposed mitigation at this intersection is appropriate, nor does it confirm how and when the mitigation would be implemented
- I consider that the signalisation of Dunns Crossing Road/Granite Drive/ Holmes Block Road, assumed in the PPC73 transport assessment, is appropriate as provides for safer access for drivers, and can provide for safe pedestrian crossings. The ITA has not provided an assessment to confirm the timing of when signalisation will be required. I recommend that the ODP text identify that

signalisation is required when the fourth arm of the intersection is formed, and that the developer is responsible for the signalisation

- I recommend that Rule 12.1.3.50 (a) restricts the Holmes Block to 97 dwellings and Rule 12.1.3.50 (b) restricts the Skellerup Block to 51 dwellings until such time that the SH1/Dunns Crossing Road intersection has been upgraded to a roundabout. Further, I recommend that an appropriate planning mechanism is applied to protect for the future upgrade of the SH1/Dunns Crossing Road intersection
- I recommend that Rule 12.1.3.50 (a) restricts the Holmes Block to 97 dwellings and Rule 12.1.3.50 (b) restricts the Skellerup Block to 51 dwellings until such time that the Dunns Crossing Road/Burnham School Road intersection is signalised, unless further assessment is provided that demonstrates the safety and efficiency effects of PPC73 on the existing intersection are acceptable
- I recommend that the ODPs indicate frontage upgrades for Dunns Crossing Road and Burnham School Road. Detailed upgrades of these roads should be determined by the developer in collaboration with Council at subdivision stage and in accordance with Council Engineering Code of Practice requirements
- I recommend that Council's Planner consider whether the proposed bund and/or fence along the Holmes Block frontage with Burnham School Road is needed to mitigate effects of development, as this measure will have a negative effect on the transport connectivity of the Holmes Block
- I recommend that the PPC73 ODP for the Skellerup Block should be amended to integrated with consented developments on the eastern side of Dunns Crossing Road and PPC70
    - Confirm alignment with RC205574 and RC215553
    - Integrate with the east/west primary road proposed by PPC70
    - Indicate a roundabout at the intersection of Dunns Crossing Road and the east/west primary road.
- I recommend that the ODPs should be amended to
    - Provide walking and cycling connectivity to SH1 (Holmes Block), if this is not precluded by any required noise attenuation
    - Extend walking and cycling links within the Holmes Block
    - Identify "Primary" roads
    - Provide for stronger north/south linkages with the Skellerup Block
    - Provide connectivity to existing and consented footpaths on the eastern side of Dunns Crossing Road (Skellerup Block), with at least two safe crossing points along the Skellerup Block frontage

I recommend that Council consider the following matters regarding effects on the wider transport network

- I recommend that Council consider the proportional effect that each PPC will have on network hotspots and assumed intersection improvements contained in the 2033 Rolleston Paramics model, as identified in Table 2. Council should consider whether the proportional effects of PPC73

affect programmed funding within the Long Term Plan, whether new projects should be added to the Long Term Plan, and how Development Contributions are calculated

I note that the 2033 Rolleston Paramics model does not incorporate the change to the SH1/Rolleston Drive South intersection, proposed as part of NZUP. Should NZUP implement these changes, it is likely that our reporting of traffic effects on Dunns Crossing Road, Brookside Road, Lowes Road (among others) are underpredicted

- I recommend that Council investigate whether the planned upgrade of Lowes Road/Dunns Crossing Road should be completed earlier than the programmed date of 2032/33, and whether the current Development Contributions policy is sufficient to reflect traffic demand through this intersection generated by PPC73
- I recommend that Council investigate whether an upgrade of Dunns Crossing Road/Goulds Road/Selwyn Road intersection should be included within the Long Term Plan, and whether the current Development Contributions policy is sufficient to reflect traffic demand through this intersection generated by PPC73
- I recommend that Council consider whether the Lowes Road/Broadlands Drive intersection requires an upgrade prior to 2033, for example to signals or a roundabout, and whether the current Development Contributions policy is sufficient to reflect traffic demand through this intersection generated by PPC73
- I recommend that Council consider whether the planned upgrade for the Selwyn Road/Lincoln Rolleston Road intersection is adequately reflected in the current Development Contributions policy in terms of traffic demand through this intersection generated by PPC73.

Should my recommendations be adopted, and noting that further assessment of the Dunns Crossing Road/Newmans Road intersection is required, I consider that the safety and efficiency effects on the localised transport network can be appropriately addressed through the future resource consent process and Council's Long Term Plan.

However, I note that PPC73 is inconsistent with the Rolleston Structure Plan, in that it is outside the anticipated urban area. Should PPC73 affect the quantum of residential growth within Selwyn, without a corresponding increase in local employment and access to services, additional impact on the Greater Christchurch transport network can be expected as additional residents in Selwyn travel to access services and employment.

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APPENDICES

1 INTRODUCTION

This report has been completed by Mat Collins (Associate) with assistance from Qing Li (Principal) and review by Ian Clark (Director). Ian, Qing and I are experts in the field of transport planning and engineering. Ian and I frequently attend Council and Environment Court mediation and hearings as transport experts for local government, road controlling authorities and private concerns.

In July 2021 Selwyn District Council (Council) requested Flow Transportation Specialists (Flow) to assist with the review of transportation matters associated with 7 Private Plan Changes (PPCs) within Rolleston

- PPC64: Rolleston, 969 residential lots
- PPC70: Rolleston, 800 residential lots plus commercial
- PPC71: Rolleston, 660 residential lots
- PPC73: Rolleston, 2100 residential lots plus commercial
- PPC75: Rolleston, 280 residential lots
- PPC76: Rolleston, 150 residential lots
- PPC78: Rolleston, 750 residential lots.

In addition, PPC66 in Rolleston (which seeks to rezone 27ha of rural land to industrial zone) has been included in our consideration of the cumulative traffic effects of the PPCs within the Rolleston area.

Rolleston West Residential Limited (requestor) has lodged a PPC to change to the Selwyn District Plan to rezone approximately 160 hectares of Living 3 zoned land, to Living Z and Business 1 (PPC73). This report details my review of PPC73. Where relevant I also make comments about the cumulative effects of all 8 Rolleston PPCs so that Council may understand how the future transport network may operate should all PPCs be approved.

The scope of this specialist transport report is to assist Council in determining the transport outcomes of PPC73 and includes the following

- A summary of PPC73 focusing on transport matters
- An overview of transport projects contained within the Long Term Plan (LTP), which are relevant to PPC73
- A summary of the modelled traffic effects of the 8 Rolleston PPCs
- A review of the material provided to support the application for PPC73, and discussion of the potential effects of PPC73
- Summary of submissions, relating to transport matters only
- My recommendations.

I have reviewed the following documents, as they relate to transport matters

- Request for Change to the Selwyn District Plan, prepared by Novo Group, dated March 2021, including

  - Appendix D Integrated Transport Assessment, dated November 2020
- RFI PC200073, response to Council information requests, prepared by Novo Group, dated 4 February 2021
- Third party traffic model files, as discussed in Section 4
- Submissions as outlined in Section 7.

2 A SUMMARY OF PPC73

PPC73 proposes to rezone approximately 160 hectares of Living 3 Zone land for primarily residential purposes, with Outline Development Plans (ODPs) proposed to guide the form and layout of future development. PPC73 includes two distinct areas, being the northern "Holmes Block" and the southern "Skellerup Block", as shown in Figure 1.

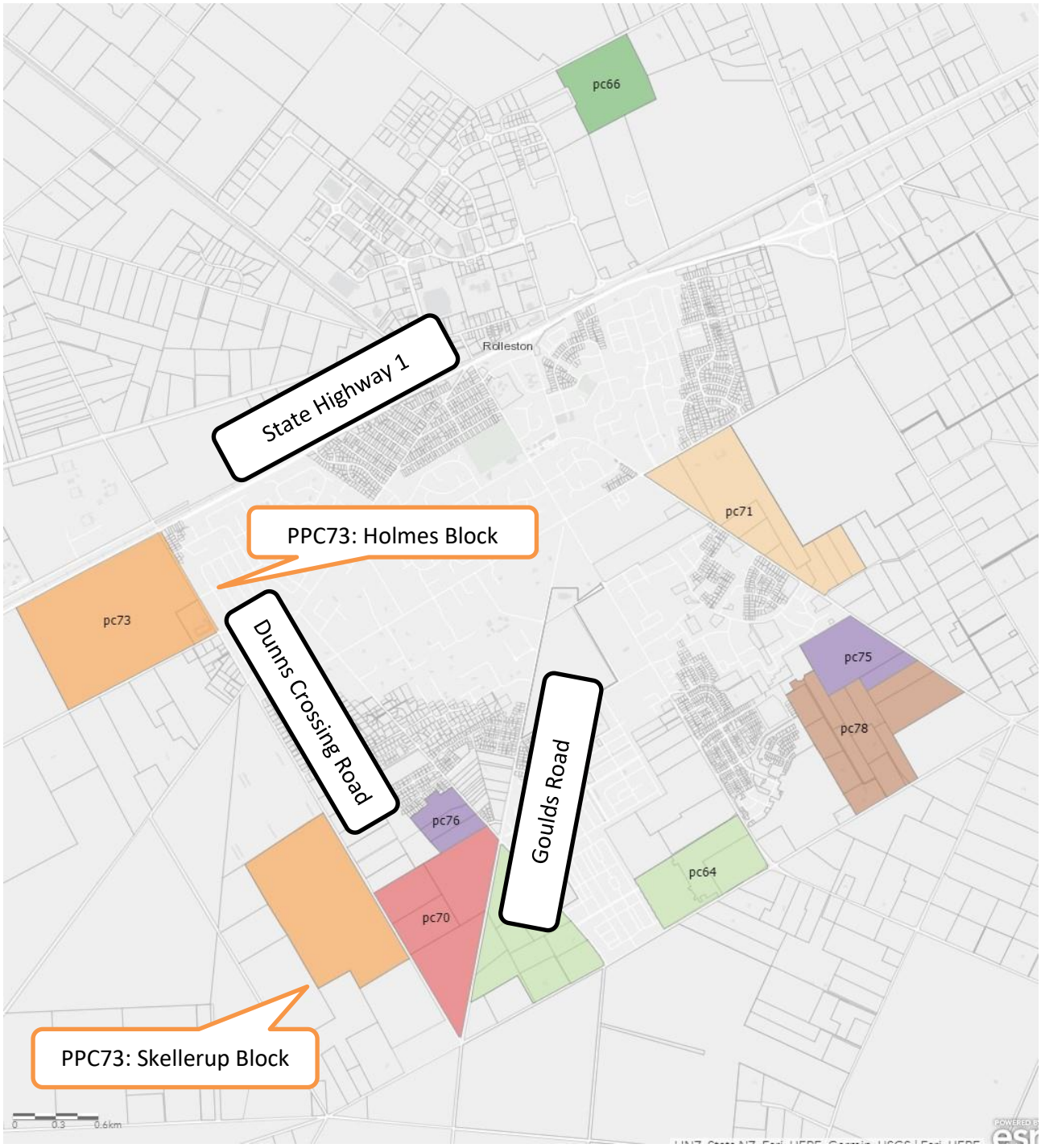
The ODP for Holmes Block is shown in Figure 2 and is intended to provide

- Up to 1150 residential lots
- A small commercial centre
- Several indicative roads forming
    - a fourth leg to the existing Dunns Crossing Road/Granite Drive intersection
    - a new intersection with Burnham School Road
    - a fourth leg to the existing Dunns Crossing Road/Newmans Road intersection
- Several green links, which will incorporate walking and cycling tracks.

The ODP for Skellerup Block is shown in Figure 3 and is intended to provide

- Up to 950 residential lots
- A small commercial centre
- Several indicative roads forming 4 new intersections with Dunns Crossing Road, one of which will potentially form an intersection with the primary east/west road indicated in Council's Rolleston Structure Plan (as discussed in Section **Error! Reference source not found.** of this report)
- Several green links, which will incorporate walking and cycling tracks.

Figure 1: Overview of PPC73 and other nearby Rolleston PPCs[1]



[1] Adapted from Council's "Current plan change requests" website, available at https://www.selwyn.govt.nz/property-And-building/planning/strategies-and-plans/selwyn-district-plan/plan-changes

Figure 2: Holmes Block ODP

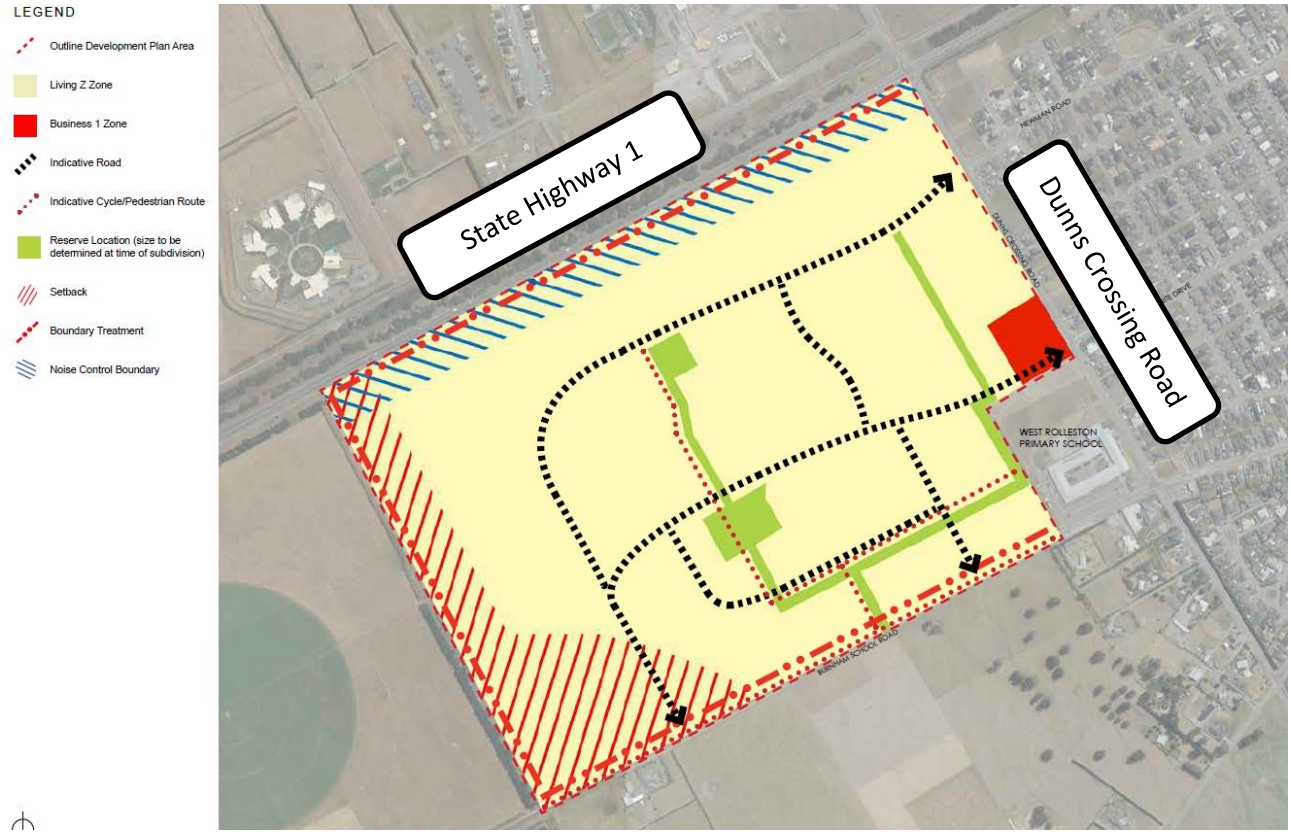
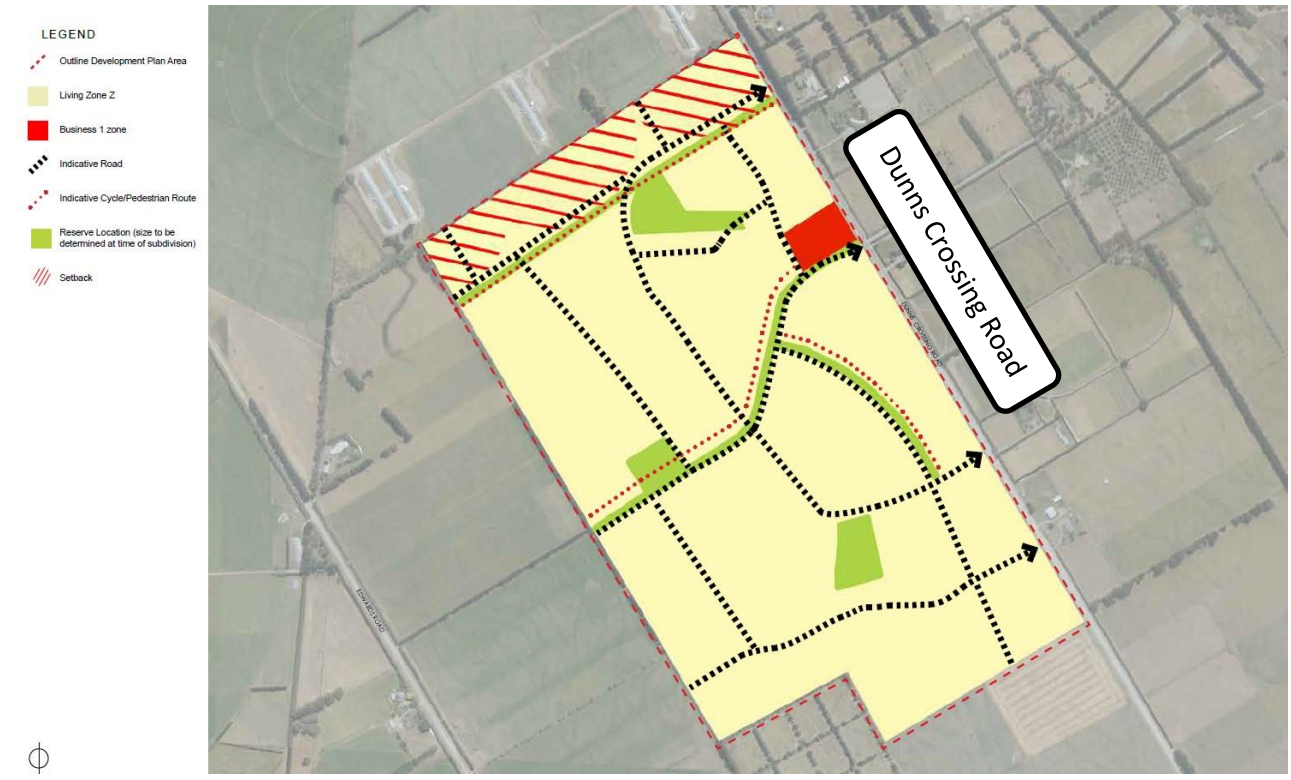


Figure 3: Skellerup Block ODP



3 ROLLESTON TRANSPORT PROJECTS RELEVANT TO PPC73

This section discusses various funded and planned transport projects in Rolleston that have relevance to PPC73.

3.1 Transport projects in the Long Term Plan

Council has provided a list of transport projects within the LTP that I consider to be relevant to PPC73. I have reproduced these in Table 1 below. Further discussion of how PPC73 is anticipated to affect various parts of the transport network, is provided in Section 4.

Table 1: LTP transport projects relevant to PPC73

Project	Scheduled year	Description	Relevance to PPC73
Traffic Signals at Rolleston Drive/Tennyson Street	2021/22	Safety upgrade, including safer pedestrian crossing	PPC73 contributes 2.8% of peak hour traffic movements in 2033
Foster Park - Park N Ride	2023/24	improved parking to access express bus services	Supports improved Public Transport access between Rolleston and Christchurch
Brookside Road/Rolleston Drive Roundabout	2024/25	Safety upgrade	PPC73 contributes 7.1% of peak hour traffic movements in 2033
Springston Rolleston Road/Selwyn Road intersection	2024/27	Safety upgrade under NLTP (Waka Kotahi)	PPC73 contributes 5.9% of peak hour traffic movements in 2033
Lowes Road/Levi Drive/Masefield Drive Intersection Upgrade	2025/26	Safety upgrade - link to Southern Motorway Interchange	PPC73 contributes 3.4% of peak hour traffic movements in 2033
Tennyson/Moore Street Roundabout	2026/27	safety upgrade as part of Moore Street extension	PPC73 contributes 2% of peak hour traffic movements in 2033
Selwyn/Weedons Road Roundabout	2027/28	Safety upgrade - Rolleston southern arterial link	PPC73 contributes 4.1% of peak hour traffic movements in 2033
Jones Road Cycleway	2027/28	Between Jones Road and Weedons Road - links to Rolleston to Templeton Cycleway	Some relevance to PPC73, however this is located more than 5km from PPC73.
Lincoln Rolleston Road/Selwyn Road Intersection Upgrade	2028/29	Safety upgrade - Rolleston southern arterial link	PPC73 contributes 4.1% of peak hour traffic movements in 2033

Walkers Road/Two Chain Road Roundabout	2028/29	safety upgrade - Rolleston Industrial Zone southern link	PPC73 contributes 6.9% of peak hour traffic movements in 2033
Goulds/East Maddisons Road Roundabout	2029/30	Connects Farrington and new subdivisions to Goulds Road	PPC73 contributes 9.5% of peak hour traffic movements in 2033
Rolleston to Burnham Cycleway	2029/30	From Elizabeth St to Aylesbury Road along the northside of SH1 and along Runners Road	Adjacent to Holmes Block, will significantly improve cycle accessibility for PPC73
Rolleston 'Park N Ride'	2030/31	new facilities for parking to access to express bus services	Supports improved Public Transport access between Rolleston and Christchurch
Burnham School Road/Dunns Crossing Road Traffic Signals	2032/33	Project funded beyond the 2021-31 LTP	Identified in the PPC73 ITA as being required to support the Plan Change. Refer to Section 5.6 of this report.
Rolleston South to Rolleston Industrial Zone Cycleway	2033/34		Some relevance to PPC73, this is within 5km of PPC73.
West Melton to Rolleston Cycleway	2034/35		Identified in the PPC73 ITA as being required to support the Plan Change. Refer to Section 5.8 of this report.
Lowes Road/Dunns Crossing Road Roundabout	2035/36		
Burnham School Road Widening	2042/43		Relates to Holmes Block. Refer to Section 6.3 of this report.

3.2 Transport projects in the New Zealand Upgrade Programme

The New Zealand Upgrade Programme (NZUP) projects in Canterbury are intended to manage growth effects by providing residents with safer and better travel choices, as well as improving freight links to support economic growth and the opening of the Christchurch Southern Motorway through to Rolleston. The NZ Upgrade Programme includes $300 million for six projects to support growth in the south-west sector of Christchurch and neighbouring Selwyn District. Projects relevant to PPC73 are discussed in Table 2.

Table 2: NZUP[2] transport projects relevant to PPC73

Project	Scheduled year	Description	Relevance to PPC73
SH1 Rolleston and Rolleston Flyover[3]	2024/2026	$125 million has been provided to create safer and better access from the residential area across State Highway 1 (SH1) and the Main South Line (railway) to the industrial zone. A new two-lane overbridge will be built to connect the two areas and provide improved walking and cycling facilities. It will cross SH1 from Rolleston Drive to Hoskyns Road. Four intersections along SH1 between Burnham and Rolleston will also be upgraded, with a range of safety improvements to reduce deaths and serious injuries and better manage the forecast future growth in traffic volumes along this section of the highway	Includes upgrade of SH1/Dunns Crossing Road, and potential changes to SH1/Rolleston Drive. Upgrade to SH1/Dunns Crossing Road is required to address safety and efficiency effects from PPC73. The 2033 Rolleston Paramics model assumes that the NZUP projects in Rolleston have been implemented, however it does not include the potential conversion of the SH1/Rolleston Drive intersection to a left in/left out.

[2] NZUP Canterbury Package, available online https://www.nzta.govt.nz/planning-and-investment/nz-upgrade/canterbury-package/

[3] Rolleston flyover and transport improvements feedback form, July 2021, available online https://www.nzta.govt.nz/assets/projects/sh1-rolleston/SH1-Rolleston-flyover-and-transport-improvements-brochure.pdf

4 MY REVIEW OF TRAFFIC MODELLING FOR THE ROLLESTON AREA

Flow has also used the following existing transport models to assess the potential effect of the 8 PPCs within the Rolleston area (as shown in Figure 1)

- 2028 Rolleston Paramics model, produced by Abley (which excludes the 8 PPCs)
- 2033 Rolleston Paramics model, produced by Abley, as summarised in the Abley memo "Rolleston Plan Change Modelling" to Council, dated 5 May 2021 (which includes the 8 PPCs).

Flow interrogated the models to understand the potential traffic effects of PPC73 both in isolation and as a cumulative effect in conjunction with the other 7 PPCs. Further detail on the methodology is provided in Appendix B, and our findings are summarised below.

I note that, concurrently with the development of the Rolleston Plan Change Modelling, Waka Kotahi has developed an alternative version of the Rolleston Model, to investigate how the SH1 NZUP project might affect the transport network. I understand that this model includes the conversion of the SH1/Rolleston Drive South intersection into a left in/left out intersection.

This is not reflected in the Rolleston Plan Change Modelling, and is likely to have a consequential effect on the traffic movements on Dunns Crossing Road, Brookside Road, and Lowes Road, among others.

4.1 PPC73 proportion of the cumulative network effects of all PPCs

The 2033 Rolleston Paramics model identifies that the following intersections will be operating near to or over capacity by 2033 if all 8 PPCs in Rolleston proceed

- SH1/Weedons Interchange South roundabout
- Lowes Road/Broadlands Drive priority intersection
- Levi Road/Ruby Drive priority intersection
- Levi Road/Strauss Drive priority intersection
- Levi Road/Weedons Road priority intersection
- Dunns Crossing Road/Newman Road priority intersection
- Selwyn Road/Lincoln Rolleston Road priority intersection with seagull treatments
- Jones Road/Weedons Road roundabout.

To determine the extent to which PPC73 is contributing to the capacity effects at these intersections, Flow interrogated the traffic flows generated by each PPC as a proportion of the modelled vehicle flow through each intersection (presented as the combination of the AM and PM peak hour flows). Further, we have included intersections where improvements have been assumed in the 2033 Rolleston Paramics (for example signalisation or conversion to a roundabout).

These results are presented in Table 3, which we have colour coded to assist interpretation

- no shading: the PPC contributes less than 2.5% of total traffic movements at this intersection

- orange shading: the PPC contributes between 2.5% and 5% of total traffic movements at this intersection
- red shading: the PPC contributes more than 5% of total traffic movements at this intersection.

In relation to intersections with predicted congestion/high delays in 2033

- Lowes Road/Broadlands Drive priority intersection is predicted to operate well in 2028, without the 8 PPCs, and to be overcapacity by 2033 with the 8 PPCs. PPC73 has a significant effect on congestion at this intersection (10.6% of total traffic movements)
- Dunns Crossing Road/Newman Road priority intersection is predicted to operate well in 2028, without the 8 PPCs, and to be overcapacity by 2033 with the 8 PPCs. PPC73 has a significant effect on congestion at this intersection (25.1% of total traffic movements)
- Selwyn Road/Lincoln Rolleston Road priority intersection with seagull treatments is predicted to be overcapacity by 2028, without the addition of traffic from the 8 PPCs. PPC73 has some contribution to congestion effects in 2033 (4.1% of total traffic movements)
- Dunns Crossing Road/Granite Drive is predicted to operate acceptably once signalised. PPC73 has a significant effect on congestion at this intersection (30% of total traffic movements).

In relation to intersections with that are not predicted to have congestion/high delays in 2033, but are assumed to have improvements

- Burnham School Road/Dunns Crossing Road intersection is assumed to be upgraded from a priority crossroad to signals. PPC73 generates 33.2% of total peak hour movements through this intersection
- Rolleston Road/Tennyson Street intersection is assumed to be upgraded from a roundabout to signals. PPC73 generates 2.8% of total peak hour movements through this intersection
- Rolleston Drive/Brookside Road intersection is assumed to be upgraded from a priority intersection to a roundabout. PPC73 generates 7.1% of total peak hour movements through this intersection
- Dunns Crossing Road/Goulds Road/Selwyn Road is assumed to be upgraded from a priority intersection to a roundabout. PPC73 generates 14.2% of total peak hour movements through this intersection
- Dunns Crossing Road/East West Primary Road is assumed to be a roundabout. PPC73 generates 32.6% of total peak hour movements through this intersection
- Lowes Road/Tennyson Street is assumed to be upgraded from a roundabout to a signalised intersection. PPC73 generates 14.1% of total peak hour movements through this intersection
- Lowes Road/East Maddisons Road is assumed to be upgraded from a priority intersection to a roundabout. PPC73 generates 13.1% of total peak hour movements through this intersection
- Lowes Road/Dunns Crossing Road is assumed to be upgraded from a priority intersection to a roundabout. PPC73 generates 30.9% of total peak hour movements through this intersection

- Lowes Road/Levi Drive/Masefield Drive is assumed to be upgraded from a roundabout to a signalised intersection. PPC73 generates 3.4% of total peak hour movements through this intersection
- Springston Rolleston Road/Selwyn Road is assumed to be upgraded from a priority intersection to a roundabout. PPC73 generates 5.9% of total peak hour movements through this intersection
- Selwyn Road /Weedons Road is assumed to be upgraded from a priority intersection to a roundabout. PPC73 generates 4.1% of total peak hour movements through this intersection
- Walkers Road/Two Chain Road is assumed to be upgraded from a priority intersection to a roundabout. PPC73 generates 6.9% of total peak hour movements through this intersection
- Goulds Road /East Maddisons Road is assumed to be upgraded from a priority intersection to a roundabout. PPC73 generates 9.5% of total peak hour movements through this intersection.

A Select Link Analysis output from the 2033 Rolleston Paramics model is provided in Appendix C, demonstrating traffic flows from PPC73. In my opinion PPC73 will have noticeable congestion effects on the following intersections

- Dunns Crossing Road/Newman Road (refer to further discussion in Section 5.1)
- Dunns Crossing Road/Granite Road (refer to further discussion in Section 5.2)
- Lowes Road/Broadlands Drive (refer to further discussion in Section 6.1)
- Selwyn Road/Lincoln Rolleston Road (refer to further discussion in Section 6.2).

In addition, PPC73 contributes more than minor traffic volumes to multiple intersections, where 3rd party intersection improvements are assumed to be in place. Information on the proportional effect of each PPC may assist Council in its consideration of how the eight PPCs may affect funding within the Long Term Plan (LTP), either by bringing forward the timing of planned infrastructure upgrades, or by introducing new projects that are needed within the LTP (for example, those assumed in the 2033 Rolleston Paramics model).

Outcome: I recommend that Council consider the proportional effect that each PPC will have on network hotspots and assumed intersection improvements contained in the 2033 Rolleston Paramics model, as identified in Table 3. Council should consider whether the proportional effects of PPC73 affect programmed funding within the Long Term Plan, whether new projects should be added to the Long Term Plan, and how Development Contributions are calculated.

I note that the 2033 Rolleston Paramics model does not incorporate the change to the SH1/Rolleston Drive South intersection, proposed as part of NZUP. Should NZUP implement these changes, it is likely that our reporting of traffic effects on Dunns Crossing Road, Brookside Road, Lowes Road (among others) are underpredicted.

Table 3: future network hotspots, planned Council projects, and proportional PPC effects

Intersection	Existing Layout	Intersection form assumed in models (2028/2033)	2028 performance without PPCs (red for LOS F)	2033 performance with all 8 PPCs (red for LOS F)	2033 traffic movements With all PPCs (AM and PM combined)	Percentage of traffic associated with each PPC as a proportion of total traffic movements through each intersection (AM and PM combined) [4]							
						PPC73	PPC64	PPC66	PPC70	PPC71	PPC75	PPC76	PPC78
						%	%	%	%	%	%	%	%
Intersections with congestion/high delays in the 2033 Rolleston Paramics model													
SH1/Weedons Interchange South	Roundabout	Roundabout in both years	LOS F on SH1 West, AM and PM	LOS F on SH1 West and Weedons Rd, AM and PM	3,870 veh	1.3%	2.1%	0.2%	2.0%	3.3%	0.7%	0.4%	1.6%
Lowes Road/Broadlands Drive	Priority	Priority in both years	LOS B and C in AM and PM respectively	LOS F on Broadlands Dr in AM, Lowes Rd west in PM	1,910 veh	10.6%	1.9%	0.0%	2.9%	2.1%	0.8%	0.5%	1.2%
Levi Road/Ruby Drive	Priority	Priority in both years	LOS B and C in AM and PM respectively	LOS F on PC71 Access in AM, Ruby Dr and Lowes Rd in PM	2,890 veh	1.7%	2.1%	0.0%	3.0%	5.4%	0.8%	0.5%	0.9%
Levi Road/Strauss Drive	Priority	Priority in both years	LOS D and C in AM and PM respectively	LOS F on Strauss Dr and Levi Rd east in AM	3,210 veh	1.2%	1.7%	0.0%	2.5%	4.0%	0.7%	0.5%	0.7%
Levi Road/Weedons Road	Priority	Priority in both years	LOS F on Weedons Rd South and Levis Rd west in PM	LOS F on Weedons Rd South in both AM and PM, and on Levis Rd west in PM	3,480 veh	1.2%	2.3%	0.0%	2.2%	3.7%	0.8%	0.4%	1.8%
Dunns Crossing Road/Newman Road	Priority	Priority in both years	LOS A in both AM and PM	LOS F on Newman Rd and PC73 access in AM	2,590 veh	25.1%	1.8%	0.0%	2.8%	0.2%	0.1%	0.4%	0.5%
Selwyn Road/Lincoln Rolleston Road	Priority	Priority/ Priority with Seagull Treatment[5]	LOS F on Lincoln Rolleston Rd north in PM	LOS F on Lincoln Rolleston Rd north in PM	3,990 veh	4.1%	5.3%	0.0%	1.8%	1.4%	1.5%	0.3%	5.3%
Jones Road/Weedons Road	Roundabout	Roundabout in both years	LOS A in both AM and PM	LOS F on Weedons Ross Rd north and Jones Rd east in PM	3,620 veh	2.1%	1.0%	0.7%	0.9%	0.8%	0.3%	0.2%	0.9%
Dunns Crossing Road/Granite Road	Priority	Priority/Signals	LOS A in both AM and PM	LOS E on Granite Rd east in AM	2,450 veh	30.0%	2.2%	0.0%	3.3%	0.3%	0.1%	0.5%	0.7%
Other intersection with upgrades assumed in the 2033 Rolleston Paramics model													
Burnham School Road/Dunns Crossing Road	Priority cross road	Signals	LOS A in both AM and PM	LOS B and A in AM and PM respectively	2,150	33.2%	3.7%	0.0%	4.8%	0.9%	0.5%	0.7%	1.5%
Tennyson Street/Moore Street	Priority	Roundabout in both years	Not provided	Not provided	1,660veh	2.0%	1.4%	0.2%	0.9%	0.6%	0.3%	0.2%	0.7%
Rolleston Road/Tennyson Street	Roundabout	Signals in both years	LOS B and C in AM and PM respectively	LOS B and C in AM and PM respectively	4,320 veh	2.8%	3.1%	0.2%	2.5%	1.1%	0.4%	0.5%	1.0%
Rolleston Drive/Brookside Road	Priority	Roundabout in both years	LOS A and C in AM and PM respectively	LOS D and C in AM and PM respectively	3,390 veh	7.1%	0.5%	0.2%	1.4%	0.8%	0.3%	0.6%	0.7%

[4] Orange shading: the PPC contributes between 2.5% and 5% of total traffic movements at this intersection. Red shading: the PPC contributes more than 5% of total traffic movements at this intersection

[5] As discussed in Section 2, we understand that Abley has recently completed another version of the 2033 Plan Change model to include a roundabout layout at this intersection, we note that this change is unlikely to change the traffic routing in the area significantly.

Intersection	Existing Layout	Intersection form assumed in models (2028/2033)	2028 performance without PPCs (red for LOS F)	2033 performance with all 8 PPCs (red for LOS F)	2033 traffic movements With all PPCs (AM and PM combined)	Percentage of traffic associated with each PPC as a proportion of total traffic movements through each intersection (AM and PM combined) [4]							
						PPC73	PPC64	PPC66	PPC70	PPC71	PPC75	PPC76	PPC78
						%	%	%	%	%	%	%	%
Dunns Crossing Road/Goulds Road/Selwyn Road	Priority	Priority/Roundabout with Priority control at Goulds /Dunns Crossing Intersection	LOS C in both AM and PM	LOS A in both AM and PM, at both intersections	1,640 veh	14.2%	3.0%	0.0%	5.8%	0.8%	0.4%	0.2%	2.2%
Dunns Crossing Road/East West Primary	Priority	Priority/Roundabout	LOS A in both AM and PM	LOS A in both AM and PM	1,670 veh	32.6%	5.5%	0.0%	8.7%	1.0%	0.5%	0.2%	1.6%
Dunns Crossing Road/Brenley Drive/Skellerup Primary Access	No intersection	Priority T/Priority Cross Road with Right Turn bays	LOS A in both AM and PM	LOS C in both AM and PM	2,280 veh	33.2%	3.6%	0.0%	5.9%	0.4%	0.2%	0.7%	0.9%
Dunns Crossing Road/ODP12 Access/ Skellerup Secondary Access	No intersection	Priority T/Priority Cross Road with Right Turn bays	LOS A in both AM and PM	LOS A in both AM and PM	1,450 veh	30.8%	5.3%	0.0%	8.5%	0.1%	0.2%	0.0%	1.2%
Lowes Road/Tennyson Street	Roundabout	Signals in both years	LOS B and C in AM and PM respectively	LOS B and C in AM and PM respectively	4,540 veh	4.1%	3.6%	0.1%	3.1%	1.0%	0.4%	0.6%	0.8%
Lowes Road/East Maddisons Road	Priority	Priority/Roundabout	LOS B and D in AM and PM respectively	LOS B and A in AM and PM respectively	2,320 veh	13.1%	2.0%	0.1%	2.1%	1.5%	0.7%	1.3%	1.6%
Lowes Road/Dunns Crossing Road	Priority	Priority/Roundabout	LOS A in both AM and PM	LOS A in both AM and PM	2,690 veh	30.9%	3.1%	0.0%	4.9%	0.9%	0.4%	0.6%	1.2%
Lowes Road/Levi Drive/Masefield Drive	Roundabout	Signals in both years	LOS B and C in AM and PM respectively	LOS C in both AM and PM	4,300 veh	3.4%	1.6%	0.1%	2.1%	4.6%	1.7%	0.4%	3.4%
Springston Rolleston Road/Selwyn Road	Priority	Roundabout in both years	LOS A in both AM and PM	LOS A in both AM and PM	3,080 veh	5.9%	10.1%	0.0%	3.1%	1.1%	0.6%	0.4%	3.1%
Selwyn Road /Weedons Road	Priority	Roundabout in both years	LOS A in both AM and PM	LOS A in both AM and PM	4,270 veh	4.1%	4.9%	0.0%	1.7%	1.3%	1.4%	0.3%	4.8%
Walkers Road/Two Chain Road	Priority	Roundabout in both years	LOS A in both AM and PM	LOS A in both AM and PM	970 veh	6.9%	1.3%	0.2%	1.6%	0.6%	0.2%	0.3%	0.7%
Goulds Road /East Maddisons Road	Priority	Priority/Roundabout	LOS A and B in AM and PM respectively	LOS A in both AM and PM	2,480 veh	9.5%	8.6%	0.0%	13.6%	2.2%	1.0%	1.2%	2.1%

5 MY REVIEW OF THE ITA

The ITA provides an assessment of the following intersections

- Dunns Crossing Road/Newman Road/Holmes Block Access
- Dunns Crossing Road/Granite Drive/ Holmes Block Access
- Burnham School Road/ Holmes Block Access
- Dunns Crossing Road/Skellerup Northern Primary Access
- Dunns Crossing Road/Skellerup Central Primary Access
- Dunns Crossing Road/Skellerup Southern Primary Access
- Dunns Crossing Road/Southern Secondary Access
- SH1/Dunns Crossing Road/Walkers Road
- Burnham School Road/Dunns Crossing Road
- Brookside Road/Dunns Crossing Road
- Lowes Road/Dunns Crossing Road
- Dunns Crossing Road/Goulds Road/Selwyn Road

I discuss my review of these intersections in the following subsections.

5.1 Dunns Crossing Road/Newman Road/Holmes Block Access

The ITA has assumed that this intersection will be a crossroad, with Dunns Crossing Road having the priority and both Newman Road and Holmes Block Access Road having two approach lanes, as shown in Figure 4. Traffic modelling in the ITA expects this intersection to operate at LOS E in the 2028 AM and PM peak periods, which indicates the intersection is nearing capacity for some movements.

The 2033 Rolleston Paramics model assumes that this intersection will be a priority intersection with single approach lanes Newman Road and Holmes Block Access Road. As identified in Table 1, the 2033 Rolleston Paramics model predicts that this intersection will operate at LOS F on the Newman Road and PC73 Holmes Access Road approaches in the AM Peak.

The differences in the modelled performance between the ITA and 2033 Rolleston Paramics model are a result of the assumed form of the intersection

- the 2033 Rolleston Paramics model assumes that Newman Road has a single approach lane
- the ITA assumes that Newman Road will have two approach lanes
- the ITA assumption reduces congestion effects by separating right turns on Newmans Road from through movements and left turns.

I have concerns about the future form and operation of this intersection

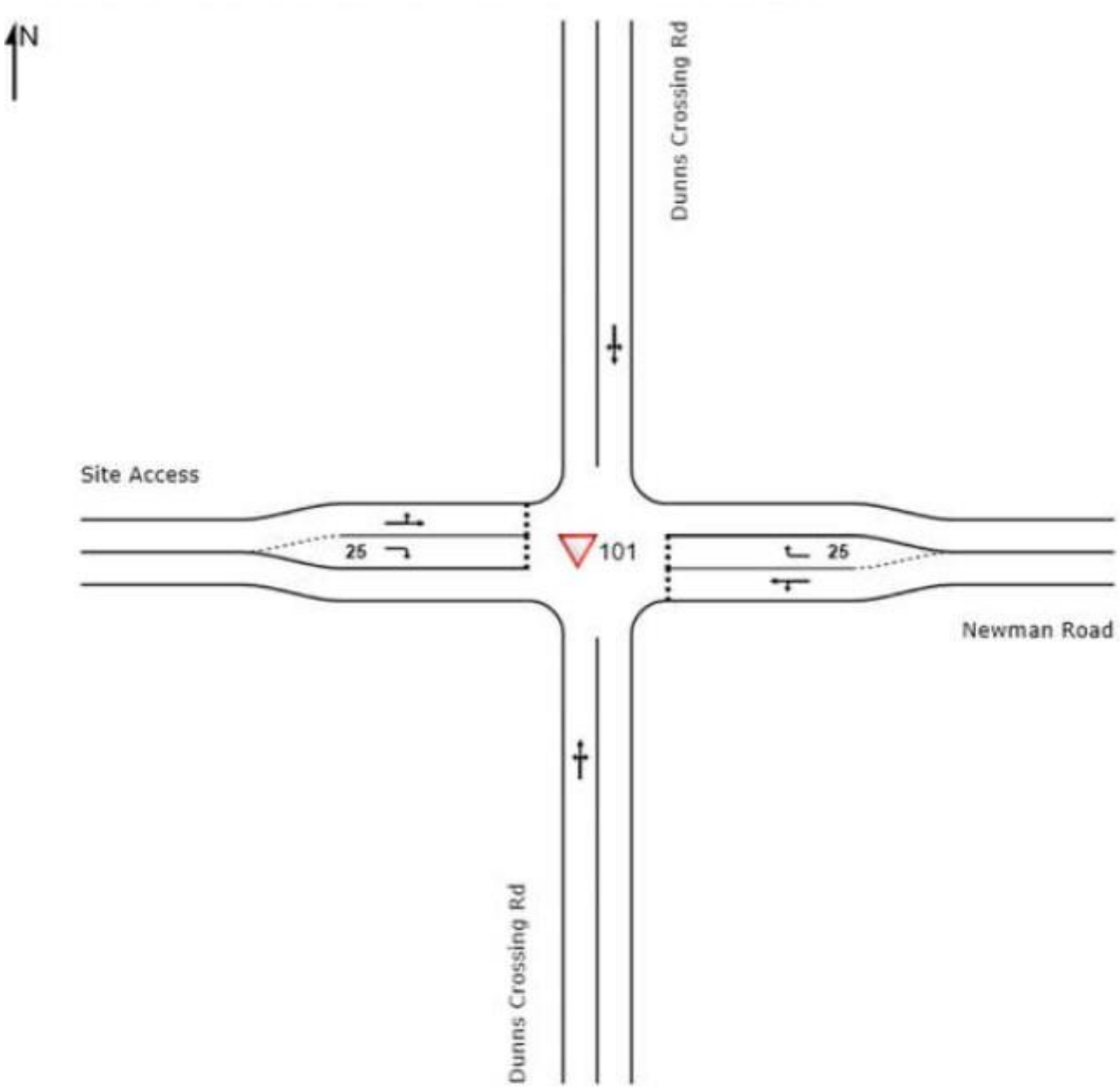
- The 2033 Rolleston Paramics model identifies significant delays for left turns out of Holmes Access Road and for all turns out Newman Road in the morning peak. These delays may result in drivers

making turning movements when there is insufficient gap in through traffic on Dunns Crossing Road, resulting in safety effects. In my view the 2033 Rolleston Paramics model demonstrates that some form of intersection upgrade is required

- The ITA proposes an intersection upgrade but does not discuss whether the proposed double lane approach on Newmans Road can be accommodated within the existing road corridor (Newmans Road is approximately 18m boundary to boundary with 5m berms) in a way that complies with Council's Engineering Standards. Nor does the ODP identify who would undertake these works, and when those works would be required
- The carriageway width of Newmans Road and Holmes Block Access road, and the cross-roads intersection form with Dunns Crossing Road, create multiple conflict points for pedestrians. This may cause more than minor safety and efficiency effects to pedestrians particularly during peak periods.

Outcome: To mitigate congestion effects at the Dunns Crossing Road/Newmans Road/Holmes Block Access Road intersection, the ITA proposes an intersection form that may not meet Council's Engineering Standards, and may result in more than minor safety and efficiency effects for road users. I consider that PPC73 has not demonstrated that the proposed mitigation at this intersection is appropriate, nor does it confirm how and when the mitigation would be implemented.

Figure 4: Dunns Crossing Road/Newman Road/Holmes Block Access assumed in the ITA



5.2 Dunns Crossing Road/Granite Drive/ Holmes Block Access

The ITA has assumed that this intersection will be a crossroad, with Dunns Crossing Road having the priority. Traffic modelling in the ITA expects this intersection to operate acceptably during the 2028 AM and PM peak periods, however movements on Granite Drive operate at LOS E in the PM peak.

Further, in the response to Council information requests, the requestor identifies that the traffic modelling supporting PPC73 assumes that this intersection will be signalised[6].

The 2033 Rolleston Paramics model assumes that this intersection will be a signalised intersection, with two entry lanes and a single exit lane assumed on each approach. As discussed in Section 4, the 2033 Rolleston Paramics model predicts that this intersection will acceptably in both the morning and evening peak periods. As shown in Table 3, PPC73 is predicted to contribute a significant proportion of total traffic to this intersection in 2033.

I consider that the signalised intersection layout, assumed in the PPC73 transport assessment, is appropriate as provides for safer access for drivers, and can provide for safe pedestrian crossings. The ITA has not provided sufficient assessment to confirm the timing of when signalisation will be required. In my view, it would be logical for the developer to signalise this intersection when the fourth arm is formed.

Outcome: I consider that the signalisation of Dunns Crossing Road/Granite Drive/ Holmes Block Road, assumed in the PPC73 transport assessment, is appropriate as provides for safer access for drivers, and can provide for safe pedestrian crossings. The ITA has not provided an assessment to confirm the timing of when signalisation will be required. I recommend that the ODP text identify that signalisation is required when the fourth arm of the intersection is formed, and that the developer is responsible for the signalisation.

5.3 Burnham School Road/Holmes Block Access

The ITA has assumed that this intersection will be a T-intersection. Traffic modelling in the ITA expects this intersection to operate acceptably during the 2028 AM and 2028 PM peak periods.

The performance of the intersection has not been reported in either the 2028 or 2033 Rolleston Paramics models. However, the model predicts very modest traffic flows on Burnham School Road west of Dunns Crossing Road.

Therefore, I consider that the detailed design of this intersection can be addressed by the developer during future subdivision consents.

5.4 Dunns Crossing Road/Skellerup Accesses

The ITA has assumed that the three primary intersections with Dunns Crossing Road will be T-intersections. Traffic modelling in the ITA expects these intersections to operate acceptably during the 2028 AM and 2028 PM peak periods.

The 2033 Rolleston Paramics model assumes that these intersections will be priority controlled intersections, some with a fourth arm extending into the developments east of Dunns Crossing Road. A four arm roundabout has also been assumed at the intersection of Dunns Crossing Road/Skellerup Third

[6] Refer to paragraph 3, *PC200073: Rolleston West Transport Response to RFI*, prepared by Novo Group, dated 2 February 2021.

Access/East West Primary Road (refer to my further discussion in Section 6.5 and recommended changes to the Skellerup ODP). As discussed in Section 4, the 2033 Rolleston Paramics model predicts that these intersections will perform acceptably in both the AM and PM peaks.

5.5 SH1/Dunns Crossing Road/Walkers Road

The ITA has assumed that this intersection will be upgraded to a dual lane roundabout prior to any significant development occurring within PPC73. Traffic modelling in the ITA expects this intersection to operate acceptably during the 2028 AM and 2028 PM peak periods.

The 2033 Rolleston Paramics model assumes that this intersection will be a double lane roundabout, with double entry and exit lanes on each approach (except a single exit lane on the Walkers Road approach). As discussed in Section 4, the 2033 Rolleston Paramics model predicts that this intersection will perform at LOS B or A in the AM and PM peaks respectively.

In its existing form, the SH1/Dunns Crossing Road/Walkers Road intersection has safety issues, with Paragraph 7 of the ITA identifying that there have been multiple injury crashes at the intersection and that Waka Kotahi is planning to upgrade the intersection to improve safety[7]. I investigated crash records from Waka Kotahi's CAS system and found that there have been 2 people seriously injured and 16 people have received minor injuries in crashes at this intersection in the last 5 years.

I consider that the upgrade of SH1/Dunns Crossing Road/Walkers Road intersection is required before any development occurs within PPC73 beyond what is already permitted within the operative District Plan, otherwise more than minor safety effects are possible. I understand that Rule 12.1.3.50 (a) restricts the Holmes Block to 97 rural dwellings and Rule 12.1.3.50 (b) restricts the Skellerup Block to 51 rural dwellings. I consider that this is an appropriate threshold until the intersection is upgraded to a roundabout.

I understand that Waka Kotahi and Selwyn District Council staff have developed several concept designs for the future roundabout, and that future land acquisition from the northern section of the Holmes Block is likely to be required to implement the upgrade. To protect for the future upgrade of the intersection, I recommend that a setback be identified which controls development near the intersection until the final design is confirmed.

I have indicatively shown the setback I consider is required in Figure 5, which measures 220m along the PPC73 boundary with Dunns Crossing Road and 280m along the PPC73 boundary with SH1. These dimensions are based on the latest concept design which shifts the intersection somewhat south and west of its current location, and realigns Dunns Cross Road and Walkers Road. I note that not all land within the area shown in Figure 5 is expected to be impacted, much of it could be available for development.

[7] Rolleston flyover and transport improvements July 2021 update, available online https://www.nzta.govt.nz/assets/projects/sh1-rolleston/SH1-Rolleston-flyover-and-transport-improvements-brochure.pdf

Figure 5: Indicative setback from SH1/Dunns Crossing Road intersection to allow for the future upgrade

Outcome: I recommend that Rule 12.1.3.50 (a) restricts the Holmes Block to 97 dwellings and Rule 12.1.3.50 (b) restricts the Skellerup Block to 51 dwellings until such time that the SH1/Dunns Crossing Road intersection has been upgraded to a roundabout. Further, I recommend that an appropriate planning mechanism is applied to protect for the future upgrade of the SH1/Dunns Crossing Road intersection.

5.6 Burnham School Road/Dunns Crossing Road

The ITA has assumed that this intersection will be upgraded to a signalised intersection. Traffic modelling in the ITA expects this intersection to operate acceptably during the 2028 AM and 2028 PM peak periods.

The 2033 Rolleston Paramics model assumes that this intersection will be a signalised intersection with double entry lanes and signal exit lanes on each approach. The 2033 Rolleston Paramics model predicts that this intersection will perform acceptably in the morning and evening peaks respectively.

As identified in Table 1, Council has programmed the upgrade of this intersection for 2032/2033. However, the safety and efficiency effects that PPC73 may have on this intersection prior to the upgrade have not been assessed in the ITA. Further, the requestor has indicated that this intersection requires

an upgrade prior to the occupation of more than 97 dwellings in the Holmes Block[8]. In my view, such a constraint should also be applied to the Skellerup Block as, without signalisation, additional through movements on Dunns Crossing Road generated by the Skellerup block may affect the safe and efficient movement of traffic on the Burnham School Road arms of the intersection.

I therefore consider that an appropriate mechanism to limit development within the Holmes Block and Skellerup Block is required until this intersection is signalised, unless further assessment is provided that demonstrates that the existing intersection can accommodate an increase in traffic prior to signalisation.

Outcome: I recommend that Rule 12.1.3.50 (a) restricts the Holmes Block to 97 dwellings and Rule 12.1.3.50 (b) restricts the Skellerup Block to 51 dwellings until such time that the Dunns Crossing Road/Burnham School Road intersection is signalised, unless further assessment is provided that demonstrates the safety and efficiency effects of PPC73 on the existing intersection are acceptable.

5.7 Brookside Road/Dunns Crossing Road

The ITA has assumed that there will be no changes to the layout of this intersection, and the traffic modelling in the ITA expects this intersection to operate acceptably during the 2028 AM and 2028 PM peak periods.

The 2033 Rolleston Paramics model assumes that there will be no changes to the layout of this intersection. The 2033 Rolleston Paramics model predicts that this intersection will perform with overall LOS E and D in the AM and PM peaks respectively. LOS E has also been predicted for the Brookside Road east through movement, albeit that the volumes associated with the movement are very modest (some 10 vehicles per hour).

Therefore, I consider changes to this intersection are not required.

5.8 Lowes Road/Dunns Crossing Road

The ITA has assessed this intersection based on its current arrangement and has identified that in 2028 the right turn from Lowes Road into Dunns Crossing Road is at capacity. The ITA has tested a signalised arrangement for this intersection and found that it works satisfactorily.

The 2033 Rolleston Paramics model assumes that this intersection will be a single lane roundabout. As discussed in Section 4, the 2033 Rolleston Paramics model predicts that this intersection will perform with LOS A in both AM and PM peaks, and that PPC73 will generate 30.9% of total peak hour traffic movements through this intersection.

As identified in Table 1, Council has programmed the upgrade of this intersection to a roundabout in 2035/36. While I consider that PPC73 has a proportional contribution to make to the upgrade of this intersection, in my view a mechanism in the District Plan to restrict development prior to its upgrade is

[8] Refer paragraph 42 and 45 in *RFI PC200073 response to Council information requests*, prepared by Novo Group, dated 4 February 2021

not required. While the traffic modelling demonstrates potential capacity issues at this intersection in 2028, I consider that this is acceptable for a while until the intersection is upgraded.

Outcome: I recommend that Council investigate whether the planned upgrade of Lowes Road/Dunns Crossing Road should be completed earlier than the programmed date of 2032/33, and whether the current Development Contributions policy is sufficient to reflect traffic demand through this intersection generated by PPC73.

5.9 Dunns Crossing Road/Goulds Road/Selwyn Road

The ITA has assumed that this intersection will remain in its current form. Traffic modelling in the ITA expects this intersection to operate acceptably during the 2028 AM and 2028 PM peak periods.

The 2033 Rolleston Paramics model assumes that this intersection will be changed to a roundabout, with Goulds Road being re-aligned further north to form a T-intersection with Dunns Crossing Road some 100 m north of Selwyn Road. The 2033 Rolleston Paramics model predicts that both intersections will perform with LOS A in the AM and PM peaks.

In its existing form, the Dunns Crossing Road/Goulds Road/Selwyn Road intersection has safety issues, with Paragraph 22 of the ITA identifying that there have been multiple injury crashes at the intersection over the past five years. I investigated crash records from Waka Kotahi's CAS system and found that there has been 1 person seriously injured and 6 people have received minor injuries in crashes at this intersection in the last 5 years.

The average daily traffic (AADT) at the intersection has been reported to be approximately 3,000 vehicles per day and 750 vehicles per day on the Dunns Crossing Road and Selwyn Road west approach respectively. The 2033 Rolleston Paramics model predicts that these volumes will increase to some 11,500 vehicles per day and 3,000 vehicles per day in 2033 respectively with the proposed PPCs. Based on the Typical Crash Rate analysis method provided in Waka Kotahi's Crash Estimation Compendium[9], the total number of crashes at the intersection is likely to increase significantly (by some 240%) should the existing intersection layout remain. This may potentially result in an additional 0.7 serious injury and 4 minor injury crashes per year based on the existing crash history.

As discussed in Section 4, PPC73 is predicted to generate 14.2% of the total peak hour vehicle movements through this intersection by 2033. I consider that an upgrade to this intersection will be required to address the safety effects of future traffic growth. While I consider that PPC73 has a proportional contribution to make to the upgrade of this intersection, in my view a mechanism in the District Plan to restrict development prior to its upgrade is not required.

Outcome: I recommend that Council investigate whether an upgrade of Dunns Crossing Road/Goulds Road/Selwyn Road intersection should be included within the Long Term Plan, and whether the current

[9] Waka Kotahi Crash Estimation Compendium, available online https://www.nzta.govt.nz/assets/resources/monetised-benefits-and-costs-manual/crash-risk-factors-guidelines-compendium.pdf

Development Contributions policy is sufficient to reflect traffic demand through this intersection generated by PPC73.

6 MY CONSIDERATION OF MATTERS NOT INCLUDED IN THE ITA

6.1 Lowes Road/Broadlands Drive intersection

The 2033 Rolleston Paramics model assumes that this intersection remains a priority T-intersection. The 2033 Rolleston Paramics model predicts that this intersection will perform at LOS F for some movements during the AM and PM peaks.

As identified in Table 3, PPC73 is expected to generate approximately 10.6% of traffic movements through this intersection in 2033. I understand that Council currently has not programmed any improvements to this intersection.

I recommend that Council consider whether this intersection requires an upgrade, for example to signals or a roundabout, and how PPC73 may contribute through Development Contributions.

Outcome: I recommend that Council consider whether the Lowes Road/Broadlands Drive intersection requires an upgrade prior to 2033, for example to signals or a roundabout, and whether the current Development Contributions policy is sufficient to reflect traffic demand through this intersection generated by PPC73.

6.2 Selwyn Road/Lincoln Rolleston Road

The 2033 Rolleston Paramics model assumes that this intersection is upgraded to a seagull intersection to address poor performance that is otherwise predicted in the PM peak.

As identified in Table 3, PPC73 is expected to generate approximately 4.1% of traffic movements through this intersection in 2033. I understand that Council currently has programmed improvements to this intersection in 2028/29.

I recommend that Council consider how PPC73 may contribute to the upgrade of this intersection through Development Contributions.

Outcome: I recommend that Council consider whether the planned upgrade for the Selwyn Road/Lincoln Rolleston Road intersection is adequately reflected in the current Development Contributions policy in terms of traffic demand through this intersection generated by PPC73.

6.3 Frontage upgrades

The application indicates a frontage upgrade for Burnham School Road along the site frontage of Holmes Block, including an off-road walking and cycling path[10]. Council has indicated that widening of Burnham School Road is programmed for 2042 – 2043 (refer to Table 1). In my view the ODP should indicate that

[10] Also refer to paragraph 46 in *RFI PC200073 response to Council information requests*, prepared by Novo Group, dated 4 February 2021

upgrades to road frontages with Dunns Crossing Road and Burnham School Road are required to be delivered by the developer[11].

Outcome: I recommend that the ODPs indicate frontage upgrades for Dunns Crossing Road and Burnham School Road. Detailed upgrades of these roads should be determined by the developer in collaboration with Council at subdivision stage and in accordance with Council Engineering Code of Practice requirements.

6.4 Bund along Burnham School Road

The Holmes Block ODP identifies that the site frontage with Burnham School Road should include a 2m high acoustic bund and/or fence. From a transport perspective I consider that this will have a negative effect on the transport permeability of the site, by reducing the connectivity of the Holmes Block with Burnham School Road. In my view greater connectivity, particularly for walking and cycling, between the Holmes Block and Burnham School Road would have a positive effect for the transport network.

Outcome: I recommend that Council's Planner consider whether the proposed bund and/or fence along the Holmes Block frontage with Burnham School Road is needed to mitigate effects of development, as this measure will have a negative effect on the transport connectivity of the Holmes Block.

6.5 Integration of the Skellerup Block with surrounding developments

I am aware that PPC70 and several consented and active subdivision consent applications are relevant when considering where the Skellerup Block connects to Dunns Crossing Road. PPC70 includes the extension of the east/west primary road, indicated in the Structure Plan (as shown in **Error! Reference source not found.**). Flow has mapped the indicative transport network provided in the ODPs for PPC64, 70, 73 and 76, as well as for RC205574 (164 & 172 Dunns Crossing Road) and RC215553 (138 Dunns Crossing Road), shown in Figure 6.

The Skellerup Block intersections with Dunns Crossing Road do not align with the future nearby transport network, particularly the east/west primary road. I recommend that the PPC73 ODP for the Skellerup Block should be amended

- Confirm alignment with RC205574 and RC215553
- Integrate with the east/west primary road proposed by PPC70
- Indicate a roundabout at the intersection of Dunns Crossing Road and the east/west primary road (as assumed in the 2033 Rolleston Paramics model).

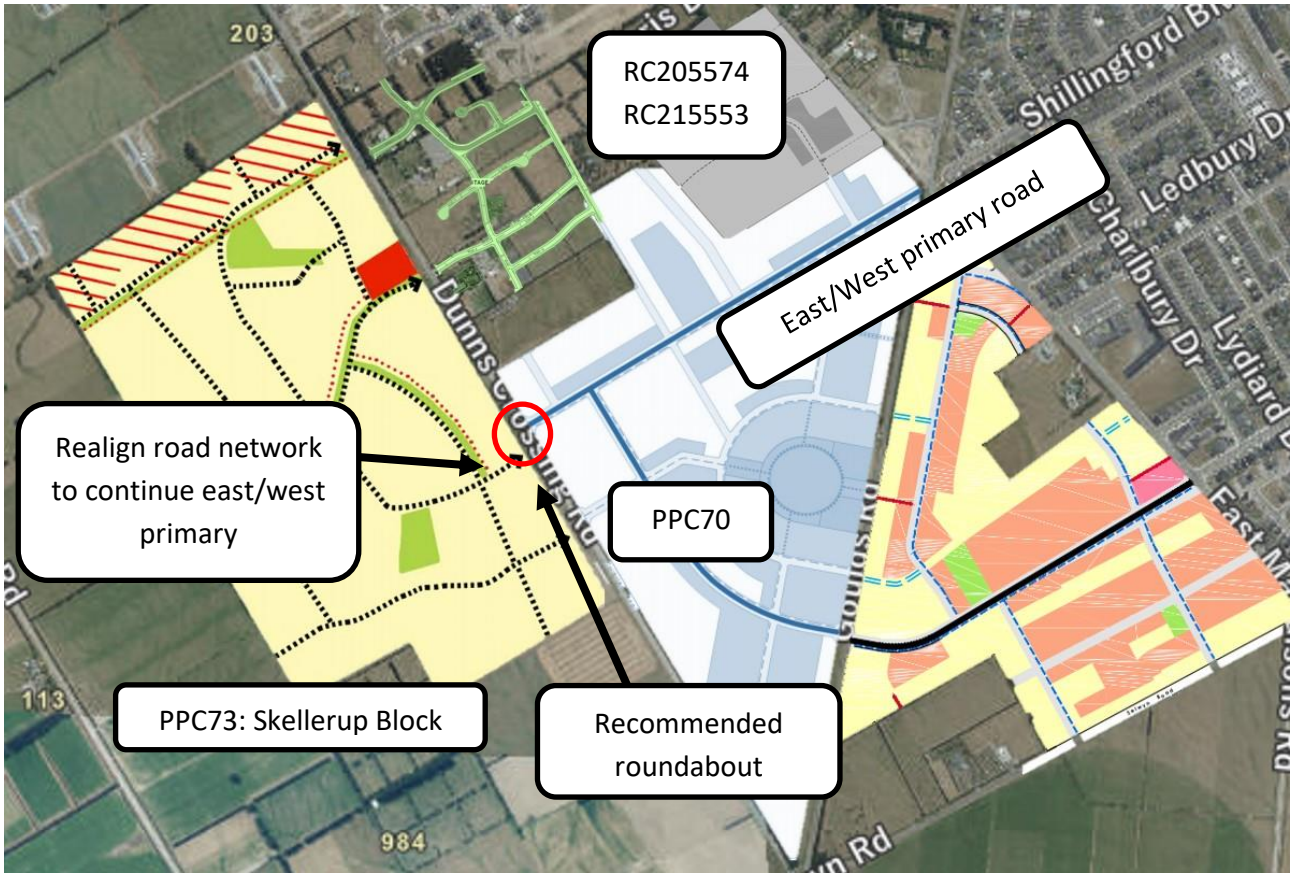
Outcome: I recommend that the PPC73 ODP for the Skellerup Block should be amended to

- ***Confirm alignment with RC205574 and RC215553***
- ***Integrate with the east/west primary road proposed by PPC70***

[11] Council's Engineering Code of Practice is available online https://www.selwyn.govt.nz/property-And-building/resource-consent/subdivision/code-of-practice

- ***Indicate a roundabout at the intersection of Dunns Crossing Road and the east/west primary road.***

Figure 6: PPC70, PPC73 and nearby subdivisions



6.6 Other amendments to the ODPs

I consider that minor amendments to the ODPs are required (refer to Figure 7 and Figure 8)

- The Holmes Block should provide connectivity for walking and cycling to SH1. As indicated in Table 1 the Rolleston to Burnham Cycleway is planned for 2029/30 and is likely to use SH1, providing an opportunity to increase accessibility to PPC73. However I note that noise attenuation along the boundary with SH1 is a priority, which may present constraints for a walking and cycling connection
- The Holmes Block should extend the walking and cycling green link near West Rolleston Primary School, to allow for flexibility in a connection to the School (if desired by the School Board), and connectivity to the transport network in the instance that a connection to the School is not formed. Also refer to Submission PC73-0011 in Table 4
- The Skellerup Block should provide stronger north/south linkages through the site
- The Skellerup Block should provide for a the extension of the east/west primary road, proposed by PPC70, through the site

- Both ODPs should indicate "Primary" roads. Figures 5 and 6 in the ITA include these classifications and I recommend that these are adopted in the ODPs. In my opinion this will provide direction to appropriate road cross sections as part of future subdivision consent applications
- Pedestrians from Skellerup block will be reliant on the footpath on the eastern side of Dunns Crossing Road, given that the majority of land uses on the western side of Dunns Crossing Road are intended to remain rural. The Skellerup Block ODP should identify the requirement for the developer to form connections between the footpath along the site frontage with the footpath on the eastern side of Dunns Crossing Road. In my view at least two crossing points should be provided, the detailing of which can be confirmed as part of future resource consents.

Outcome: I recommend that the ODPs should be amended to

- ***Provide walking and cycling connectivity to SH1 (Holmes Block), if this is not precluded by any required noise attenuation***
- ***Extend walking and cycling links, as discussed in Section 6.6***
- ***Identify "Primary" roads***
- ***Provide for stronger north/south linkages (Skellerup Block)***
- ***Provide connectivity to existing and consented footpaths on the eastern side of Dunns Crossing Road (Skellerup Block), with at least two safe crossing points along the Skellerup Block frontage***

Figure 7: Holmes Block ODP amendments

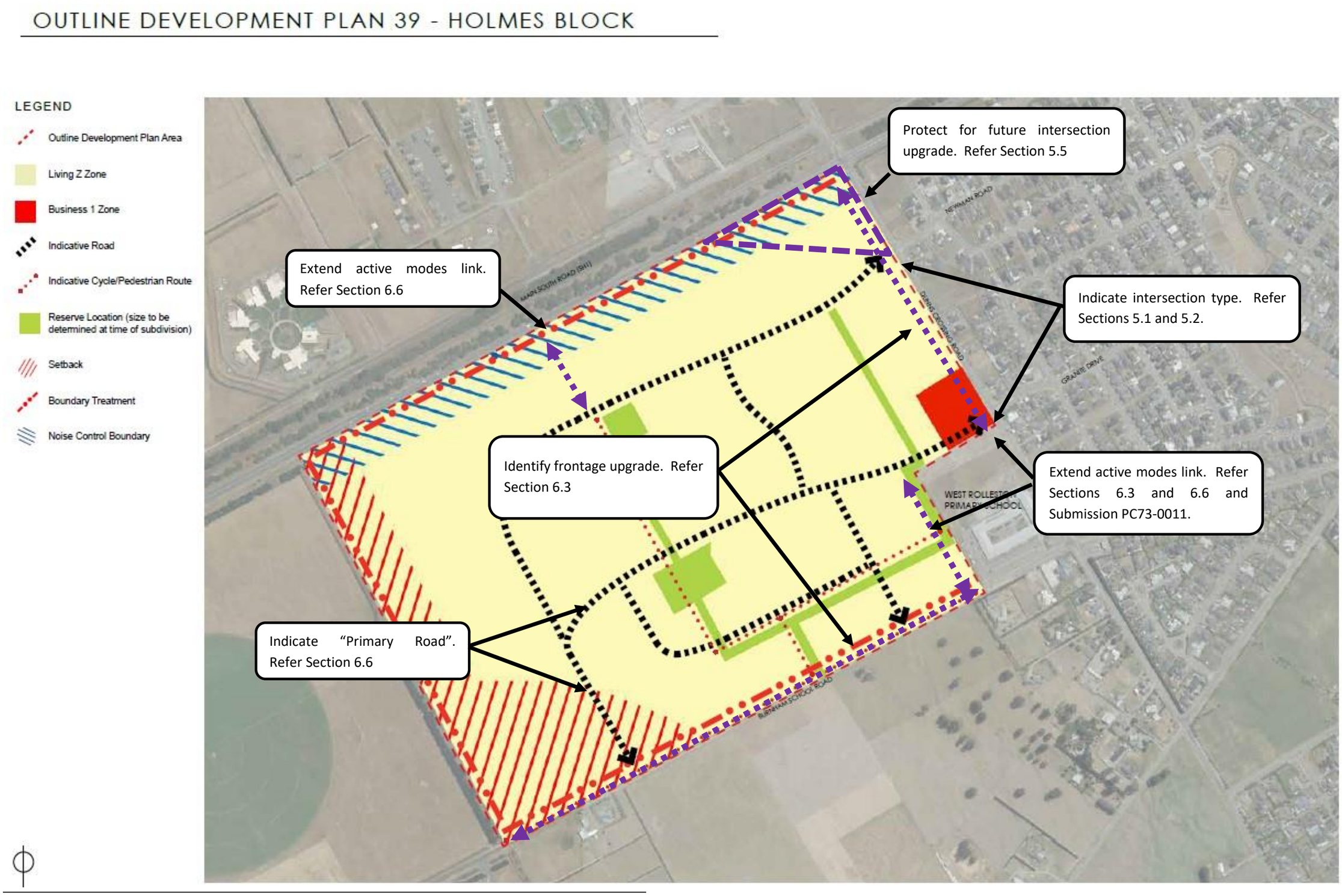
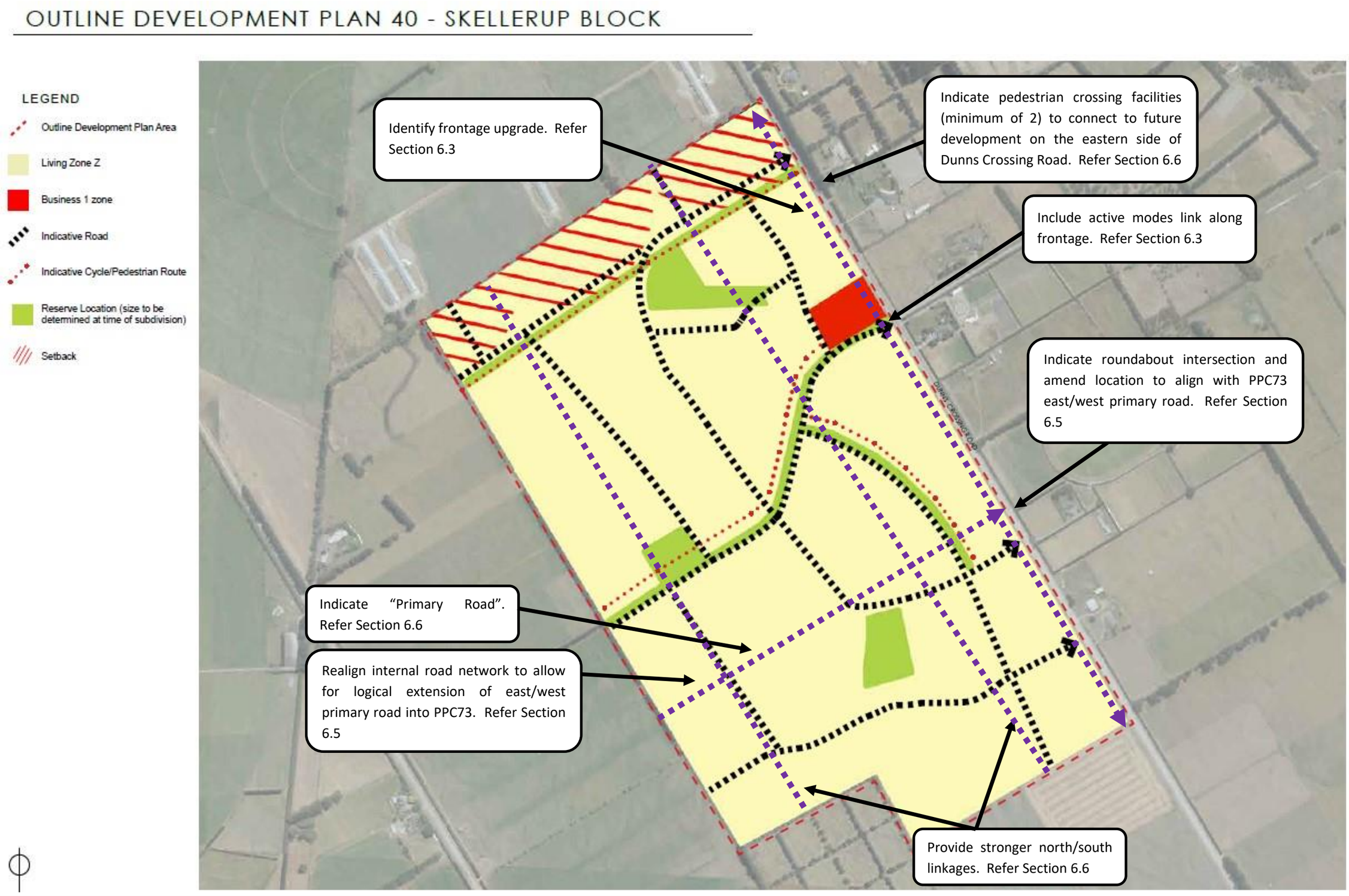


Figure 8: Skellerup Block ODP amendments



7 MY REVIEW OF RELEVANT POLICIES AND PLANS RELATING TO TRANSPORT

As part of my review, I have considered the Rolleston Structure Plan (Structure Plan)[12].

The Structure Plan was prepared in 2009 and provides a high-level plan that shows the arrangement of land-use types, and identifies public infrastructure, such as streets, schools, rail, reservoirs and natural features. The Structure Plan's purpose is to consider how existing and future development in Rolleston should be integrated in order to ensure that sustainable development occurs and makes best use of natural resources.

PPC73 sits outside of the anticipated urban area, as shown in Figure 9. The Structure Plan indicates that Dunns Crossing Road is anticipated to be an arterial road along the Holmes Block, and a Collector (Distributor) Road with a cycle route along the Skellerup Block.

The transport effects of PPC73, and other PPCs within Rolleston, have been assessed for the local transport network (as discussed in Section 4). The effects on the wider transport network have not been assessed.

I regard to the potential effects of PPC73 on the wider transport network

- If PPC73 does not affect the quantum of residential growth within Rolleston over the life of the District Plan (i.e. residential growth in Selwyn District is a "zero sum game", with PPC73 drawing growth demand away from other parts of Selwyn), PPC73 is unlikely to result in significant wider transport network effects beyond what are already anticipated by strategic growth plans and policies (such as Our Space and the CRPS).
- If PPC73 (as a Plan Change outside the anticipated urban area) leads to greater residential growth in Selwyn beyond what has been anticipated strategic growth plans and policies, without a corresponding increase in local employment and access to services, additional impact on the Greater Christchurch transport network can be expected as additional residents in Selwyn travel to access services and employment.

Outcome: PPC73 is inconsistent with the Rolleston Structure Plan, in that it is outside the anticipated urban area. Should PPC73 affect the quantum of residential growth within Selwyn, without a corresponding increase in local employment and access to services, additional impact on the Greater Christchurch transport network can be expected as additional residents in Selwyn travel to access services and employment.

[12] Rolleston Structure Plan, available online https://www.selwyn.govt.nz/__data/assets/pdf_file/0015/14361/Final-Rolleston-Structure-Plan-230909.pdf

Figure 9: Rolleston Structure Plan with PPC73 location

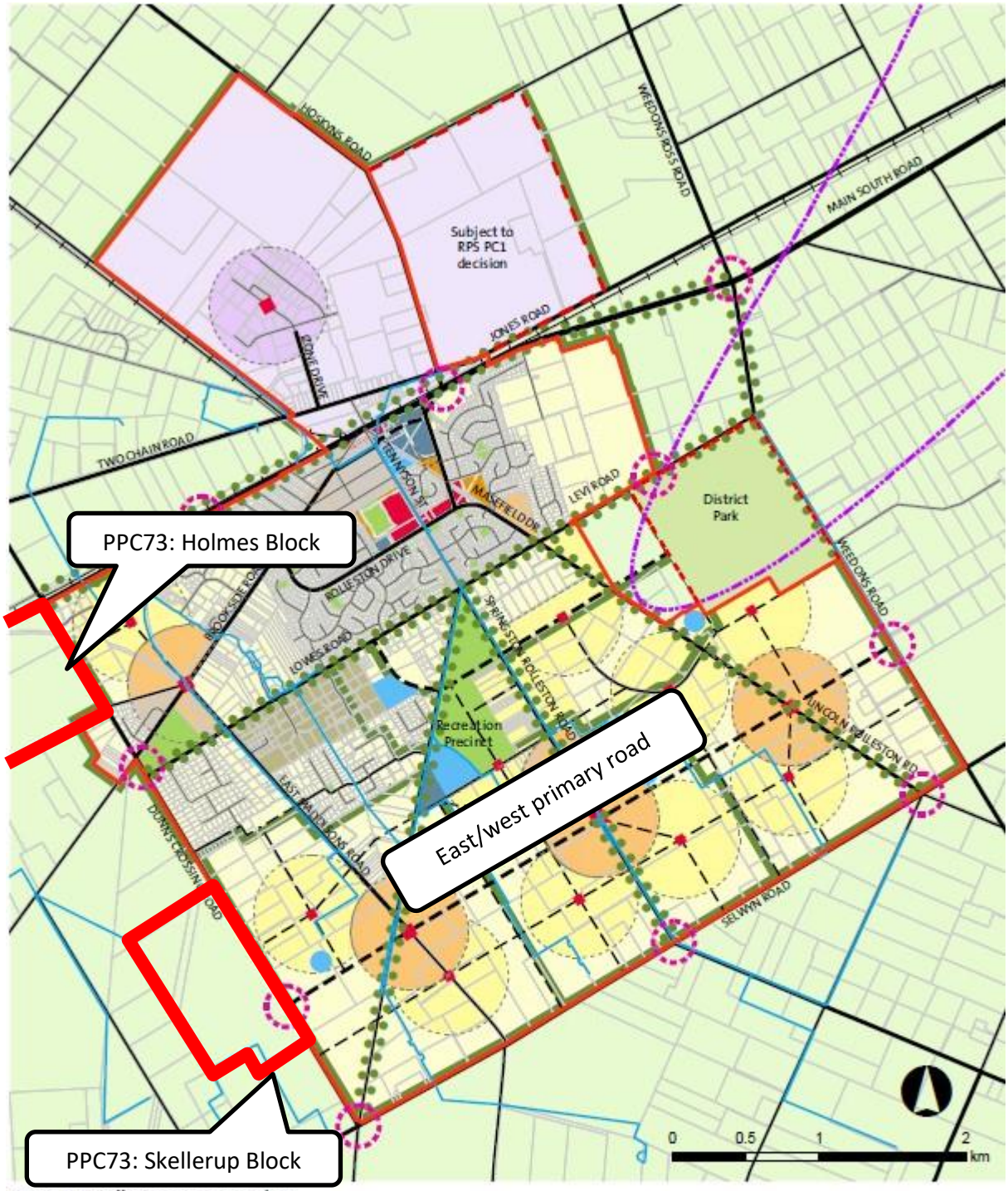
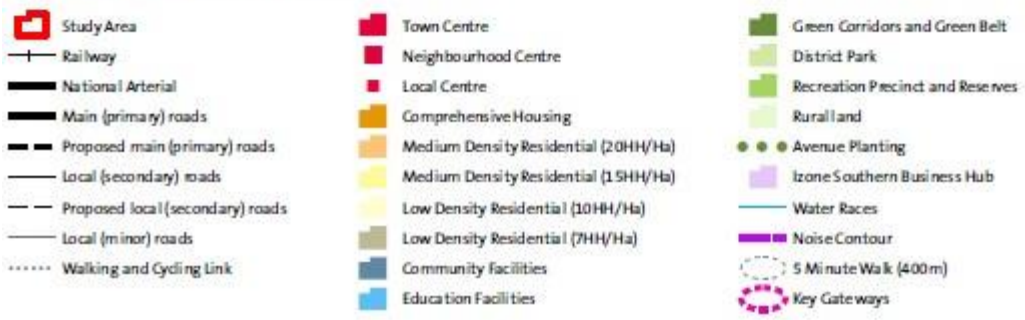


Figure 5.2: Rolleston Structure Plan



8 MY REVIEW OF SUBMISSIONS

8.1 Submissions

Multiple submissions related to transport matters were received. Transport matters contained in submissions can be grouped into the following broad topics

- Alignment to regional policies and plans
- Congestion and safety effects, including the suitability of existing road widths
- Changes to speed limits
- Funding mechanisms for transport infrastructure
- Walking and cycling accessibility, and general connectivity of the proposed transport network.

Details of the submissions, and my comments, are provided in Table 4 in Appendix A.

9 SUMMARY AND CONCLUSION

I have reviewed the PPC73 application documents, responses to Council information requests, and submissions.

In terms of the immediate effects of PPC73, and the proposed ODP

- To mitigate congestion effects at the Dunns Crossing Road/Newmans Road/Holmes Block Access Road intersection, the ITA proposes an intersection form that may not meet Council's Engineering Standards, and may result in more than minor safety and efficiency effects for road users. I consider that PPC73 has not demonstrated that the proposed mitigation at this intersection is appropriate, nor does it confirm how and when the mitigation would be implemented
- I consider that the signalisation of Dunns Crossing Road/Granite Drive/ Holmes Block Road, assumed in the PPC73 transport assessment, is appropriate as provides for safer access for drivers, and can provide for safe pedestrian crossings. The ITA has not provided an assessment to confirm the timing of when signalisation will be required. I recommend that the ODP text identify that signalisation is required when the fourth arm of the intersection is formed, and that the developer is responsible for the signalisation
- I recommend that Rule 12.1.3.50 (a) restricts the Holmes Block to 97 dwellings and Rule 12.1.3.50 (b) restricts the Skellerup Block to 51 dwellings until such time that the SH1/Dunns Crossing Road intersection has been upgraded to a roundabout. Further, I recommend that an appropriate planning mechanism is applied to protect for the future upgrade of the SH1/Dunns Crossing Road intersection
- I recommend that Rule 12.1.3.50 (a) restricts the Holmes Block to 97 dwellings and Rule 12.1.3.50 (b) restricts the Skellerup Block to 51 dwellings until such time that the Dunns Crossing Road/Burnham School Road intersection is signalised, unless further assessment is provided that demonstrates the safety and efficiency effects of PPC73 on the existing intersection are acceptable
- I recommend that the ODPs indicate frontage upgrades for Dunns Crossing Road and Burnham School Road. Detailed upgrades of these roads should be determined by the developer in collaboration with Council at subdivision stage and in accordance with Council Engineering Code of Practice requirements
- I recommend that Council's Planner consider whether the proposed bund and/or fence along the Holmes Block frontage with Burnham School Road is needed to mitigate effects of development, as this measure will have a negative effect on the transport connectivity of the Holmes Block
- I recommend that the PPC73 ODP for the Skellerup Block should be amended to integrated with consented developments on the eastern side of Dunns Crossing Road and PPC70
    - Confirm alignment with RC205574 and RC215553
    - Integrate with the east/west primary road proposed by PPC70
    - Indicate a roundabout at the intersection of Dunns Crossing Road and the east/west primary road.
- I recommend that the ODPs should be amended to

- Provide walking and cycling connectivity to SH1 (Holmes Block), if this is not precluded by any required noise attenuation
- Extend walking and cycling links within the Holmes Block
- Identify "Primary" roads
- Provide for stronger north/south linkages with the Skellerup Block
- Provide connectivity to existing and consented footpaths on the eastern side of Dunns Crossing Road (Skellerup Block), with at least two safe crossing points along the Skellerup Block frontage

I recommend that Council consider the following matters regarding effects on the wider transport network

- I recommend that Council consider the proportional effect that each PPC will have on network hotspots and assumed intersection improvements contained in the 2033 Rolleston Paramics model, as identified in Table 2. Council should consider whether the proportional effects of PPC73 affect programmed funding within the Long Term Plan, whether new projects should be added to the Long Term Plan, and how Development Contributions are calculated

  I note that the 2033 Rolleston Paramics model does not incorporate the change to the SH1/Rolleston Drive South intersection, proposed as part of NZUP. Should NZUP implement these changes, it is likely that our reporting of traffic effects on Dunns Crossing Road, Brookside Road, Lowes Road (among others) are underpredicted
- I recommend that Council investigate whether the planned upgrade of Lowes Road/Dunns Crossing Road should be completed earlier than the programmed date of 2032/33, and whether the current Development Contributions policy is sufficient to reflect traffic demand through this intersection generated by PPC73
- I recommend that Council investigate whether an upgrade of Dunns Crossing Road/Goulds Road/Selwyn Road intersection should be included within the Long Term Plan, and whether the current Development Contributions policy is sufficient to reflect traffic demand through this intersection generated by PPC73
- I recommend that Council consider whether the Lowes Road/Broadlands Drive intersection requires an upgrade prior to 2033, for example to signals or a roundabout, and whether the current Development Contributions policy is sufficient to reflect traffic demand through this intersection generated by PPC73
- I recommend that Council consider whether the planned upgrade for the Selwyn Road/Lincoln Rolleston Road intersection is adequately reflected in the current Development Contributions policy in terms of traffic demand through this intersection generated by PPC73.

Should my recommendations be adopted, and noting that further assessment of the Dunns Crossing Road/Newmans Road intersection is required, I consider that the safety and efficiency effects on the localised transport network can be appropriately addressed through the future resource consent process and Council's Long Term Plan.

However, I note that PPC73 is inconsistent with the Rolleston Structure Plan, in that it is outside the anticipated urban area. Should PPC73 affect the quantum of residential growth within Selwyn, without a corresponding increase in local employment and access to services, additional impact on the Greater Christchurch transport network can be expected as additional residents in Selwyn travel to access services and employment.

APPENDIX A Submission summary

Table 4: Submission summary and commentary

Submitter	Summary of submission	Flow comment	Status
Christchurch City Council (PC73-0007)	That the description of well-functioning urban environments within the NPS-UD includes reference to such environments supporting reductions in greenhouse gas emissions. They have concerns that the proposal relies on a future public transport network which has not been planned or funded to provide connections and consider it is unclear how the additional traffic anticipated by the plan change will support reductions in greenhouse gas emissions without this network. That the application does not address the difference between accessibility through public or active transport, and car based connections to employment. They note that the of the site does not provide sufficient local employment to meet the needs for the potential residents, and that the travel times to reach major employment hubs such as the Christchurch city centre would take approximately 25 minutes via car and almost 90 minutes via bus. They consider that reference in the request that it is possible to provide public transport does not address this disparity and promotes the reliance on car based transport. They consider it unclear how this will achieve a reduction in greenhouse gas emissions, noting that this forms part of the definition of a well-functioning urban environment in the NPS-UD That "Our Space" includes direction for Selwyn District Council to consider development infrastructure and the downstream effects on the Greater Christchurch transport network. They consider that in absence of a funded and established public transport network to service the site, the development will likely impact on the ability of the Council to manage the downstream transport network. That the description of well-functioning urban environments within the NPS-UD includes reference to such environments being resilient to the likely current and future effects of climate change. They note that the Christchurch City Council declared a climate emergency in May 2019 to enable climate to be a primary consideration for long-term planning and set the target for Christchurch to be a carbon neutral city. They state that "transport planning and infrastructure is a significant component of moving to a carbon neutral city and it is important that new urban growth areas occur in locations which align with this wider climate change objective". They consider that an increase in commuter traffic, as anticipated by the traffic assessment provided with the plan change application, will result in more people making trips, resulting in increased emissions, congestion and longer journey times. They consider that to reduce private motor vehicle dependency and reduce emissions, new urban growth areas and development should be of a form which enables viable public transport services. As such, they seek that a funded and implemented public transport system is provided to service the site, including connections to Christchurch City, prior to any residential development	If PPC73 leads to greater residential growth in Selwyn beyond what is anticipated in the CRPS and Our Space, without a corresponding increase in employment and access to services, additional impact on the Greater Christchurch transport network can be expected. Refer to my discussion in Section **Error! Reference source not found.** of this report. This is likely to have a greater effect on GHG emissions, compared with development in a more accessible and public transport serviced location. In my view PPC73 does not preclude the future provision of public transport services, provided amendments to the ODP's are made to improve network connectivity, as discussed in Sections 6.5 and 6.6 of this report. In my view, the funding and implementation of a public transport system is a matter for Rolleston as a whole, rather than a site specific matter relating to this plan change. I consider it would be difficult to require the developer of these sites to fund and implement a public transport system to service the site.	Support in part. Refer to my discussion in Sections **Error! Reference source not found.**, 6.5 and 6.6 of this report.
Waka Kotahi (PC73-0010)	Highlights the importance of providing for multi-modal transport, particularly to facilities within the township that people will be able to travel to by other means than by car, and states that the applicant should further consider opportunities for multi-modal transport through any adjoining the application sites, and incorporate these into the plan change to promote both internal connection and connections to the wider network	I support Waka Kotahi's view on this matter and I have made multiple recommendations to improve the connectivity and accessibility of the proposed transport network for PPC73. Refer to my recommendations in Section 9 of this report.	Support. Refer to my recommendations in Section 9 of this report.

	The existing safety issues associated with the Dunns Crossing Road/Walkers Road/SH1 intersection, which are proposed to be addressed through an upgrade likely to be progressed in 2024 and completed by 2026. While accepting that the applicant has recognised the existing issues, and proposed to retain the existing cap on the number of dwellings in the Holmes Block that are able to be occupied prior to the upgrade being complete, the submitter considers that the safety risks associated with any development justify a limitation on any development occurring prior to the upgrade being completed. K. & E. Shaffer (PC73-0013) similarly seek that a roundabout or other improvements are undertaken to SH1/Walkers/Dunns Crossing Road intersection before any new subdivision development starts. The Ministry of Education (PC73-0048) also seek confirmation that the threshold of 97 houses is appropriate.	I support Waka Kotahi's view on this matter, refer to my discussion in Section 5.5 of this report.	Support. Refer to my discussion in Section 5.5 of this report.
	Identify the potential for land within the Holmes Block to be required for the intersection upgrade and seek to work with the applicant and the Council in determining potential land requirements, to be incorporated into the ODP for the Holmes Block		
Environment Canterbury (PC73-0049)	that the accommodation of additional traffic volumes from the plan change area is contingent on the planned intersection upgrades. They consider that any proposed or potential upgrades to the transport network should not be taken for granted or relied upon to demonstrate capacity. They also note that the plan change site is not well serviced by public transport, nor is public transport available within a walkable catchment and state that plan change also does not provide for any integrated transport options. They consider that development in this location is therefore likely to be dependent on private motor vehicle use. They consider that the above factors lead to the proposal being inconsistent with Objective 6.2.4 and various policies in the CRPS relating to the transport network and land use integration. In their view, the ITA and Economic Assessment do not adequately address the wider transport and environmental impacts, such as congestion and carbon emissions, arising from trips into Christchurch City	I consider that the required intersection upgrades can be secured through amendments to the district plan, refer to my discussion in Sections 5 and 6, and recommendations in Section 9 relating to intersection upgrades.	Support in part. Refer to Sections 5, 6, and 9 of this report.
T. Dawson-McMurdo (PC73-0011)	Concerned that the proposed green link connects to the school's current fields and does not provide appropriate access to the bike and scooter area. She seeks that safer and more appropriate links, discussed with the school, are provided into the school site	I support the submitter's request in part. Refer to my discussion in Section 6.6	Support. Refer to my discussion in Section 6.6
C. Falconer (PC73-0001), K. & E. Shaffer (PC73-0013), E. Lancaster (PC73-0014), Ministry of Education (PC73-0048).	That the additional development will increase traffic generally, as well as around West Rolleston School and Brookside Park, which may impact safety and increase congestion around the school.	Support in part. I consider that measures are required to ensure integrated delivery of transport improvements. Refer to my recommendations in Section 9.	Support in part. Refer to my recommendations in Section 9.
B. & H. Mitchell (PC73-0004), J. Horne (PC73-0006), M. & X. Bentley (PC73-0012), K. & E. Shaffer (PC73-0013). E. Lancaster (PC73-0014)	The existing safety issues at various intersections, (including the Dunns Crossing Road and Main South Road intersection, Dunns Crossing Road and Burnham School Road intersection and Dunns Crossing Road and Lowes Road) and the impact of additional traffic on this		
B. & H. Mitchell (PC73-0004)	That the additional traffic will affect the flow of road users heading south	I do not support the submitter's view. The traffic modelling for the future roundabout at SH1/Dunns Crossing Road demonstrates acceptable performance for southbound traffic.	I do not support the submitters view
J. Munro (PC73-0002), K. & E. Shaffer (PC73-0013), E. Lancaster (PC73-0014), C. Barrett (PC73-0016)	That roads are too narrow, or already congested, and not appropriate for increased traffic	Refer to my discussion in Section 6.3 regarding frontage upgrades. I consider that this, along with other urban development along Dunns Crossing Road will result in an appropriate road width. Refer to Sections 4 and 9 in regard to congestion and required mitigations.	Support in part. Refer to Section 4, 6.3, and 9

T. Parker (PC73-0003), M. Green (PC73-0008), K. Green (PC73-0009), T. Dawson-McMurdo (PC73-0011)	The reduction in speed limits resulting from the development, and additional traffic in this area, will create delays and congestion	Additional congestion will occur as a result of PPC73. However, if intersection improvements are provided, as recommended in Section 9, localised congestion effects can be managed. PPC73 will have an effect on the wider network, however as discussed in Section 4 this is cumulative as a result of multiple Plan Changes within the Rolleston area. I note that PPC73 does not propose to lower any speed limits, these are set and can only be adjusted by the Road Controlling Authority. I consider that a reduction in speed limit will have minimal effect delay during congested periods, as delays are generally caused at intersections in urban areas, rather than due to speed limits. Outside of peak periods I consider that a reduced speed limit, while causing some increase in travel time, is beneficial to safety outcomes.	Support in part, oppose in part.
M. Green (PC73-0008), K. Green (PC73-0009), T. Dawson-McMurdo (PC73-0011), K. & E. Shaffer (PC73-0013)	The speed of traffic on Dunns Crossing Road and Burnham School Road and its impact on pedestrians and cyclists, and lack of cycle lanes	Speed limit changes are decided by the Road Controlling Authority, and cannot be implemented by developers. I anticipate that Council, as the Road Controlling Authority, will reduce existing speed limits on Burnham School Road and Dunns Crossing Road as required to support urbanisation. In regard to provision for pedestrians and cyclists, refer to my discussion and recommendations in Section 6.	Support in part, refer to my discussion and recommendations in Section 6.
J. Munro (PC73-0002), E. Lancaster (PC73-0014)	The costs of upgrading roads, including potential costs to existing ratepayers	Refer to Section 4, where the proportional traffic from PPC73 is tabulated. I recommend Council consider this in the context of the LTP and Development Contributions policy.	Neither support nor oppose. Refer to my discussion in Section 4.
T. Dawson-McMurdo (PC73-0011)	The impact of the 'possible bund location' on Burnham School Road alongside the school creating further visibility issues for traffic	Any bund would need to be located within private property, outside of the legal road. I consider that this will not affect existing sight lines from the school accesses on Burnham School Road. Detail on the bund location can be confirmed as part of future resource consent applications.	Matter can be addressed as part of future resource consent applications.
K. & E. Shaffer (PC73-0013)	That rezoning of Skellerup Block would result in no walking or cycling access to West Rolleston School	Refer to my discussion and recommendation for pedestrian and cycling improvements in Section 6 of this report.	Support in part. Refer to Section 6 of this report.
E. Lancaster (PC73-0014)	The traffic assessment does not assess the effects of the increased traffic volumes on the motorway north of Rolleston to and from Christchurch, including the Rolleston Drive Exit and Weedons Ross Road Exits	Refer to modelling summary and proportional contribution of PPC73 to wider congestion effects in Section 4.	Support in part, refer to my discussion in Section 4.
C. Falconer (PC73-0001)	Requiring the upgrade of the SH1 and Dunns Crossing intersection, by widening with left/right turning lanes first, and then having a long term plan for some kind of interchange, including setting aside any land within the plan change site required for this	Support in part. Refer to my discussion in Section 5.5. I am unaware of long term plans for grade separation and consider that this is outside the scope of PPC73. Should this be required I consider that this is a matter for Waka Kotahi to pursue outside of the Plan Change process, for example using the Public Works Act.	Support in part. Refer to my discussion in Section 5.5.
E. Lancaster (PC73-0014)	Limiting the number of dwellings able to be inhabited in the Skellerup Block before the intersection of Dunns Crossing and Lowes Roads are upgraded	Support. Refer to my discussion in Section 5.5.	Support. Refer to my discussion in Section 5.5.

Ministry of Education (PC73-0048)	Addressing in sufficient detail the traffic effects of the proposed roading network and Business 1 (Local Centre) zone on West Rolleston Primary School and including mitigation measures so that any effects are appropriately managed	Support in part. Refer to my discussion in Sections 5.1, 5.2, and 5.6 in regard to intersection improvements near the School. In my opinion, localised traffic effects of the Business 1 zone (such as parking, access, and pedestrian safety and amenity) can be addressed through future resource consents.	Support in part. Refer to my discussion in Section 5.1, 5.2, and 5.6.
C. Falconer (PC73-0001)	Widening Brookside Road to enhance cyclist safety	I consider that this is outside of the scope of PPC73, implementation of the wider cycle network improvements is not required to mitigate the effects of PPC73.	Neither support nor oppose.
C. Barrett(PC73-0016)	Requiring any development on Dunns Crossing Road to contribute to upgrading the narrow section between Lowes Road and the new seal at the Goulds Road end to meet the Council's design standards and Engineering Codes of Practice for the projected traffic volumes	Refer to my discussion in Section 6.3 regarding frontage upgrades. I consider that this, along with other urban development along Dunns Crossing Road will result in an appropriate road width.	Support in part. Refer to Section 6.3.
C. Falconer (PC73-0001)	Requiring any subdivision to have footpaths on both sides of the road	Support in part. Cross sections for new roads within PPC73 can be determined at subdivision consent stage, and will be guided by Council's Engineering Standards. I consider that the Skellerup Block should provide for a safe pedestrian crossing of Dunns Crossing Road to connect to the existing/consented footpath network on the eastern side of Dunns Crossing Road. Refer to my discussion in Section 6.6.	Support in part, can be addressed as part of future subdivision consent. Refer to my discussion in Section 6.6.
K. & E. Shaffer (PC73-0013)	Reducing the speed limit of Dunns Crossing Road to a single limit of 50 km/hour	Neither support nor oppose. I note that PPC73 does not propose to lower any speed limits, these are set and can only be adjusted by the Road Controlling Authority. I consider Council will consider whether speed limit changes on Burnham School Road and Dunns Crossing Road are required should PPC73 be approved.	Neither support nor oppose. Speed limit changes can only be implemented by the Road Controlling Authority.
K. & E. Shaffer (PC73-0013)	Adding cycle lanes and pedestrian crossings, including within the Skellerup Block, and on Selwyn Road	Neither support nor oppose. Cross sections for new roads within PPC73 can be determined at subdivision consent stage, and will be guided by Council's Engineering Standards. I consider that wider cycle network improvements are not required to mitigate the effects of PPC73.	Neither support nor oppose.
E. Lancaster (PC73-0014), I. Robertson (PC73-0050)	Requiring appropriate upgrades to local roads	Support. Refer to my discussion in Sections 4, 5, 6, and 9.	Support. Refer to my discussion in Sections 4, 5, 6, and 9.
E. Lancaster (PC73-0014)	Reviewing the Goulds and Selwyn Roads intersection	Support. Refer to my discussion in Section 5.9.	Support. Refer to my discussion in Section 5.9.
E. Lancaster (PC73-0014)	Including a provision to manage traffic around Brookside Park, to ensure pedestrian safety	I am unaware of specific pedestrian safety issues around Brookside Park. Refer to my discussion in Section 5.8 regarding Dunns Crossing Road and Lowes Road intersection. Upgrading this intersection to a roundabout could improve pedestrian crossing opportunities adjacent to Brookside Park.	Neither support nor oppose.

APPENDIX B Traffic modelling technical note

flow
TRANSPORTATION SPECIALISTS

technical note

PROJECT	**SELWYN DISTRICT PLAN CHANGE 73**
SUBJECT	**TRAFFIC MODELLING REVIEW**
TO	**SELWYN DISTRICT COUNCIL**
FROM	QING LI (FLOW)
REVIEWED BY	MAT COLLINS (FLOW)
DATE	13 AUGUST 2021

1 INTRODUCTION

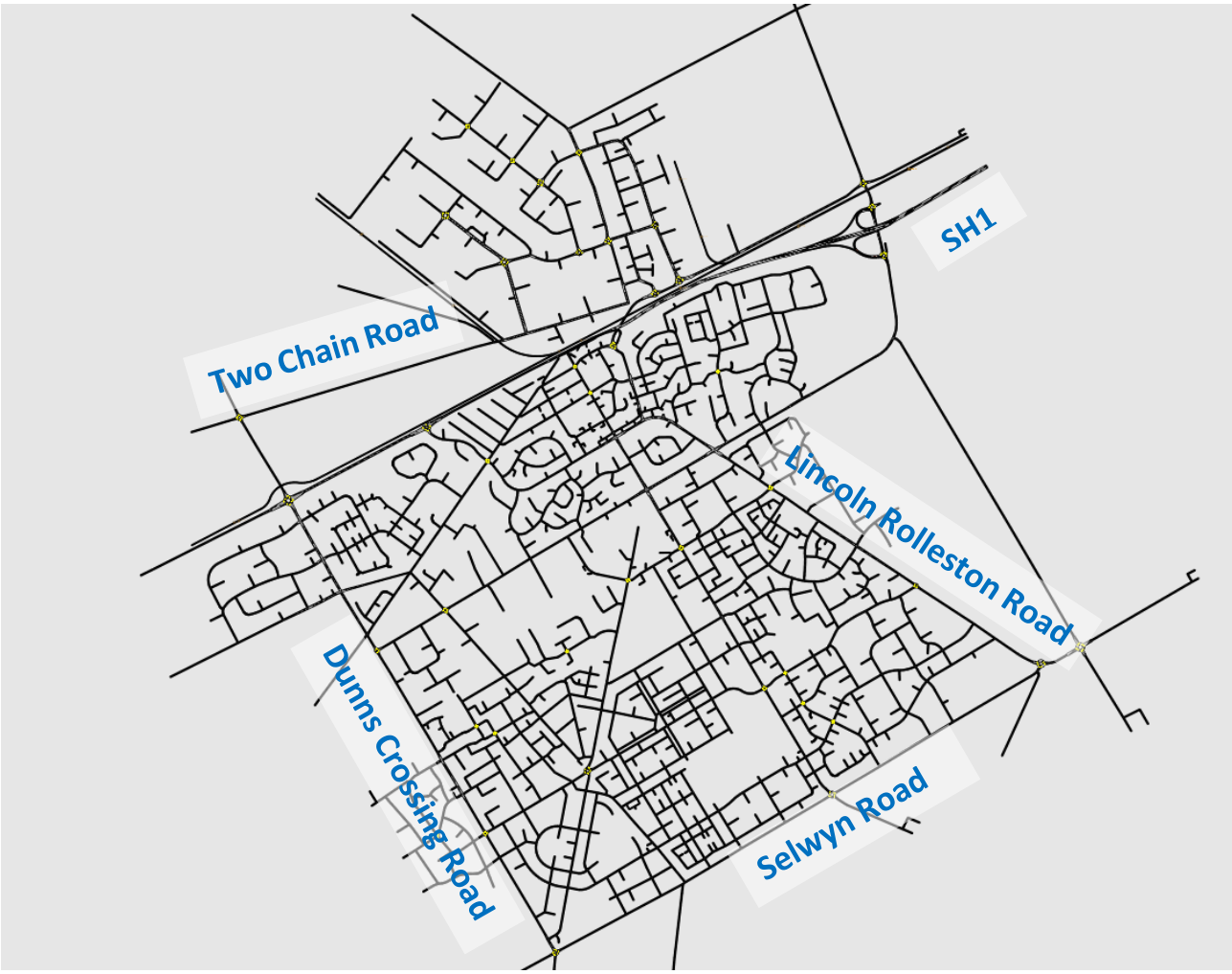
This technical note provides a summary of the traffic modelling assessment completed for Private Plan Change 73 (PPC73) in Rolleston, Selwyn District. The assessment has been based on the Paramics model developed by Abley Limited (Abley). This model was developed in May 2021 and it assumes a 2033 background traffic/network scenario and the full development of the Outline Development Plans (ODPs).

It includes the following Private Plan Changes (PPCs) in Rolleston

- PPC64: Rolleston, 969 residential lots
- PPC66: Rolleston, rural zone to industrial zone
- PPC70: Rolleston, 800 residential lots plus commercial
- PPC71: Rolleston, 660 residential lots
- PPC73: Rolleston, 2100 residential lots plus commercial
- PPC75: Rolleston, 280 residential lots
- PPC76: Rolleston, 150 residential lots
- PPC78: Rolleston, 750 residential lots.

The development of the model and the associated transport network assessment is summarised in the Abley technical note ”Rolleston Plan Change Modelling (May 2021)”. An overview of the Paramics model is provided in Figure 1 overleaf.

Figure 1: Rolleston Plan Change Paramics Model



In August 2021, Flow Transportation Specialists (Flow) was commissioned by Selwyn District Council to review the traffic effects associated with PPC73. We have therefore obtained the 2033 Plan Change model to understand the cumulative effects of the various plan changes. The results are discussed and summarised in this technical note.

2 HIGH LEVEL REVIEW OF THE PARAMICS MODEL

As part of our review of the Paramics mode we noted the following

- The model assumes 2033 background traffic informed by the 2028 and 2038 Christchurch Assignment and Simulation Transportation (CAST) model. In our view this is appropriate
- Traffic generation of each PPCs in the Rolleston area has been based on the land use/trip rates information provided in the Integrated Transport Assessments (ITAs) prepared for each PPC (if available). A common vehicle trip rate of 0.9 trips per hour per household has been applied to all PPCs in both the morning and evening peaks. We consider that this trip rate is reasonable, given the existing low public transport (PT) and active mode shares in the area[1]

[1] 2018 Census Main Means of Travel to Work data (retrieved from https://commuter.waka.app/) suggested a mode share of 3%, 7% and 3% for PT, walking and cycling respectively for the Rolleston Central, North East, North West, South West and South East areas.

- In addition, we also note that the model has assumed a PT modal shift of some 6% to 8% between Rolleston and Christchurch (SH1 East) and 2.5% for trips to/from Lincoln (including walking and cycling). A 5% mode shift to walking and cycling within Rolleston has also been assumed. These adjustments have resulted in reductions of some 5% to 10% to the raw traffic generation for each PPC area, we consider that this is reasonable, however it is likely that improvements to PT and active modes access will be required within Rolleston to achieve this mode share
- The traffic distribution of each PPC in the 2033 model has been based on the origins and destinations of existing residential trips. We have looked at the predicted trip distribution for the PPC73 area, and note the following
    - A high percentage of PPC73 demands are assumed to travel to/from zones within Rolleston (40% and 55% in AM and PM respectively). These figures are similar to the existing 40% distribution reported in the 2018 Means of Travel to Work data (AM peak only)
    - Traffic to /from SH1 East (to Christchurch) is predicted to be some 15% to 20% of the total traffic generated by PPC73, making it the second highest trip origin/destination of the PPC73 demands. (A detailed trip distribution summary for PPC73 is included as an Appendix to this technical note)
- The network assumptions included in the 2033 Plan Change model were based on Counil's Long Term Plan (up to 2032-33). The model also assumes the SH1 changes proposed west of the SH1/Weedons Road interchange as part of the Government's NZUP programme. This is reasonable as the 2021 update from Waka Kotahi states that construction is due to start in 2024[2]
- We note the following from these assumptions
    - As discussed in Section 3 of the Abley technical note, the Business Case for the Rolleston component of the NZUP programme is on-going and its outcome may change the access/route choice options between the Rolleston area and SH1
    - We note that a more recent model has been developed which includes a roundabout layout at the Lincoln Rolleston Road/Selwyn Road intersection. We however note that this is unlikely to significantly change the vehicle routing in the model
    - The model predicts that the SH1/Weedons Road interchange will operate with high delays with the existing layout, and roundabout metering signals have been assumed in the model at the Weedons Road southern roundabout to reduce delays. We note that these appeared to be a temporary solution and congestion is still predicted in the 2033 model with the PPCs

In summary, we consider that the 2033 Rolleston Paramics Plan Change model is is fit for purpose for our high level assessment of the potential effects of the eight PPCs in the Rolleston area.

In addition, the Abley technical note also included the results of a 2028 model which assumed no PPC developments in Rolleston. To investigate the background traffic growth predicted between the 2028

[2] https://www.nzta.govt.nz/planning-and-investment/nz-upgrade/canterbury-package/

and 2033 models, we have compared the total traffic demands in the non-PPC zones between the two models.

Table 1: Background Traffic Demand Comparison

Peak	Morning Peak		Evening Peak	
Years	**2028**	**2033**	**2028**	**2033**
Total Traffic Demands	21,300	21,400	24,410	24,530

The above table indicates that background traffic demands are not predicted to change significantly between 2028 and 2033. We however note that some of the growth between 2028 and 2033 may have been reduced by the PT/active mode shift assumptions in the 2033 models. The assumed pass-by trips for the PPCs may also have reduced background traffic in the 2033 models.

3 PREDICTED HOT SPOTS WITHIN ROLLESTON

Based on the model results provided in the Abley technical note, the following intersections are predicted to operate at Level of Service (LOS) F, for one or more movements during the morning and/or evening peak periods with the proposed PPC developments. We have undertaken Select Link Analysis to determine the traffic flows through each of these intersections, which provides understanding of the proportion of traffic flows associated with each PPC. This analysis has also been done for the intersections with layout improvements assumed in the 2033 Plan Change models.

The proportions are displayed in Figure 1 below and the detailed percentages for each PPC are provided in Table 1 overleaf. We have used the following colour code to assist interpretation:

- no shading: the PPC is predicted to contribute less than 2.5% towards the traffic volumes at this intersection
- orange shading: the PPC contributes between 2.5% and 5% towards the traffic volumes at this intersection
- red shading: the PPC contributes more than 5% towards the traffic volumes at this intersection.

The predicted intersection performance in 2028, without the proposed PPCs in the Rolleston area, has also been obtained from the Abley technical note and provided in the table for comparison. In this assessment, we have focused on the peak hours, being 7 am – 8 am in the morning and 5 pm – 6 pm in the evening.

Figure 2: Predicted Percentage of Traffic from PPCs at Each 'Hot Spot'

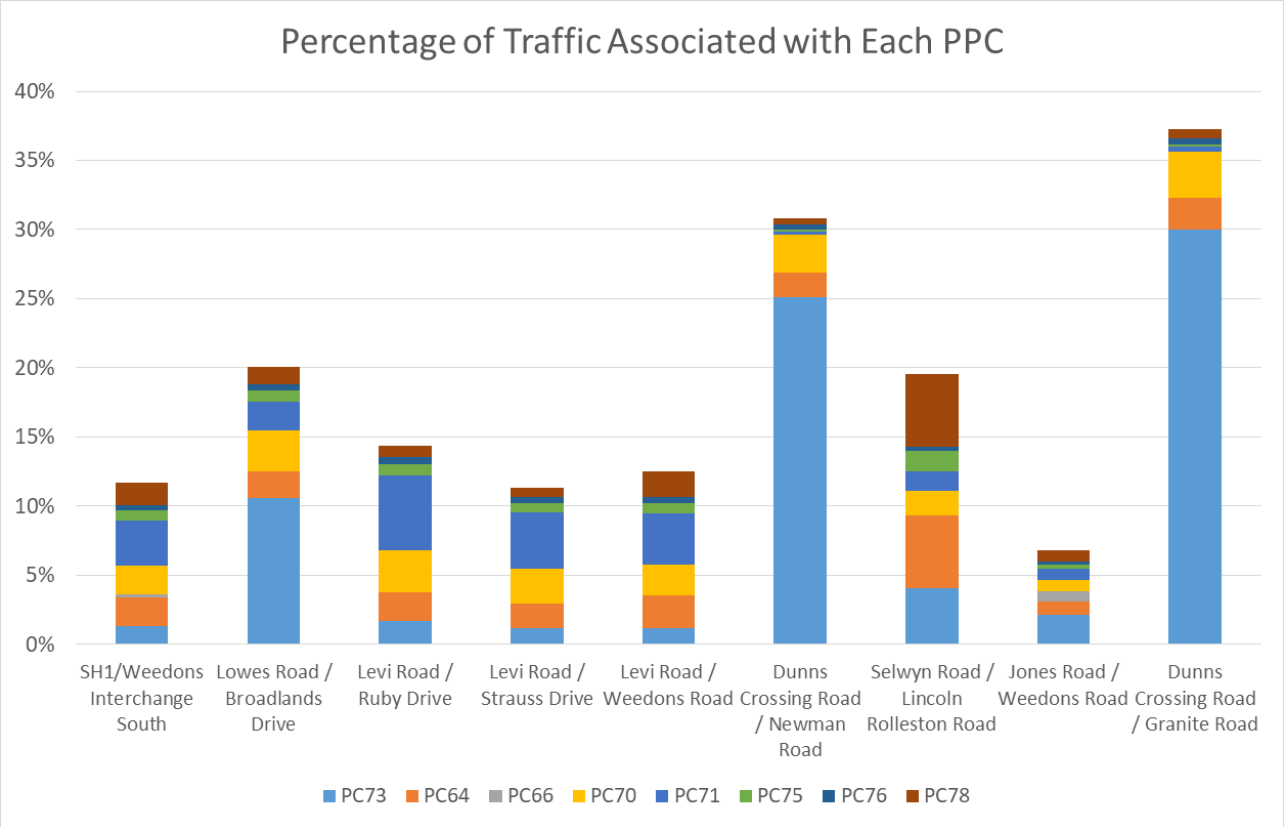


Table 2: 2033 network performance and individual PPC effects

Intersection	Existing Layout	Intersection form assumed in models (2028/2033)	2028 performance without PPCs	2033 performance with all 8 PPCs	2033 traffic movements With all PPCs (AM and PM combined)	Percentage of traffic associated with each PPC as a proportion of total traffic movements through each intersection (AM and PM combined)							
						PPC73	PPC64	PPC66	PPC70	PPC71	PPC75	PPC76	PPC78
						%	%	%	%	%	%	%	%
Intersection with Congestion/High Delays													
SH1/Weedons Interchange South	Roundabout	Roundabout in both years	LOS F on SH1 West, AM and PM	LOS F on SH1 West and Weedons Rd, AM and PM	3,870 veh	1.3%	2.1%	0.2%	2.0%	3.3%	0.7%	0.4%	1.6%
Lowes Road / Broadlands Drive	Priority	Priority in both years	LOS B and C in AM and PM respectively	LOS F on Broadlands Dr in AM, Lowes Rd west in PM	1,910 veh	10.6%	1.9%	0.0%	2.9%	2.1%	0.8%	0.5%	1.2%
Levi Road / Ruby Drive	Priority	Priority in both years	LOS B and C in AM and PM respectively	LOS F on PC71 Access in AM, Ruby Dr and Lowes Rd in PM	2,890 veh	1.7%	2.1%	0.0%	3.0%	5.4%	0.8%	0.5%	0.9%
Levi Road / Strauss Drive	Priority	Priority in both years	LOS D and C in AM and PM respectively	LOS F on Strauss Dr and Levi Rd east in AM	3,210 veh	1.2%	1.7%	0.0%	2.5%	4.0%	0.7%	0.5%	0.7%
Levi Road / Weedons Road	Priority	Priority in both years	LOS F on Weedons Rd South and Levis Rd west in PM	LOS F on Weedons Rd South in both AM and PM, and on Levis Rd west in PM	3,480 veh	1.2%	2.3%	0.0%	2.2%	3.7%	0.8%	0.4%	1.8%
Dunns Crossing Road / Newman Road	Priority	Priority in both years	LOS A in both AM and PM	LOS F on Newman Rd and PC73 access in AM	2,590 veh	25.1%	1.8%	0.0%	2.8%	0.2%	0.1%	0.4%	0.5%
Selwyn Road / Lincoln Rolleston Road	Priority	Priority/ Priority with Seagull Treatment[3]	LOS F on Lincoln Rolleston Rd north in PM	LOS F on Lincoln Rolleston Rd north in PM	3,990 veh	4.1%	5.3%	0.0%	1.8%	1.4%	1.5%	0.3%	5.3%
Jones Road / Weedons Road	Roundabout	Roundabout in both years	LOS A in both AM and PM	LOS F on Weedons Ross Rd north and Jones Rd east in PM	3,620 veh	2.1%	1.0%	0.7%	0.9%	0.8%	0.3%	0.2%	0.9%
Dunns Crossing Road / Granite Road	Priority	Priority / Signals	LOS A in both AM and PM	LOS E on Granite Rd east in AM	2,450 veh	30.0%	2.2%	0.0%	3.3%	0.3%	0.1%	0.5%	0.7%
Intersection with Layout Changes													
Tennyson Street / Moore Street	Priority	Roundabout in both years	Not provided	Not provided	1,660veh	2.0%	1.4%	0.2%	0.9%	0.6%	0.3%	0.2%	0.7%
Rolleston Road / Tennyson Street	Roundabout	Signals in both years	LOS B and C in AM and PM respectively	LOS B and C in AM and PM respectively	4,320 veh	2.8%	3.1%	0.2%	2.5%	1.1%	0.4%	0.5%	1.0%
Rolleston Drive / Brookside Road	Priority	Roundabout in both years	LOS A and C in AM and PM respectively	LOS D and C in AM and PM respectively	3,390 veh	7.1%	0.5%	0.2%	1.4%	0.8%	0.3%	0.6%	0.7%
Dunns Crossing Road / Goulds Road / Selwyn Road	Priority	Priority / Roundabout with Priority control at Goulds /Dunns Crossing Intersection	LOS C in both AM and PM	LOS A in both AM and PM, at both intersections	1,640 veh	14.2%	3.0%	0.0%	5.8%	0.8%	0.4%	0.2%	2.2%
Dunns Crossing Road / East West Primary	Priority	Priority / Roundabout	LOS A in both AM and PM	LOS A in both AM and PM	1,670 veh	32.6%	5.5%	0.0%	8.7%	1.0%	0.5%	0.2%	1.6%

[3] As discussed in Section 2, we understand that Abley has recently completed another version of the 2033 Plan Change model to include a roundabout layout at this intersection, we note that this change is unlikely to change the traffic routing in the area significantly.

Intersection	Existing Layout	Intersection form assumed in models (2028/2033)	2028 performance without PPCs	2033 performance with all 8 PPCs	2033 traffic movements With all PPCs (AM and PM combined)	Percentage of traffic associated with each PPC as a proportion of total traffic movements through each intersection (AM and PM combined)							
						PPC73	PPC64	PPC66	PPC70	PPC71	PPC75	PPC76	PPC78
						%	%	%	%	%	%	%	%
Dunns Crossing Road / Brenley Drive / Skellerup Primary Access	No intersection	Priority T / Priority Cross Road with Right Turn bays	LOS A in both AM and PM	LOS C in both AM and PM	2,280 veh	33.2%	3.6%	0.0%	5.9%	0.4%	0.2%	0.7%	0.9%
Dunns Crossing Road / ODP12 Access/ Skellerup Secondary Access	No intersection	Priority T / Priority Cross Road with Right Turn bays	LOS A in both AM and PM	LOS A in both AM and PM	1,450 veh	30.8%	5.3%	0.0%	8.5%	0.1%	0.2%	0.0%	1.2%
Lowes Road / Tennyson Street	Roundabout	Signals in both years	LOS B and C in AM and PM respectively	LOS B and C in AM and PM respectively	4,540 veh	4.1%	3.6%	0.1%	3.1%	1.0%	0.4%	0.6%	0.8%
Lowes Road / East Maddisons Road	Priority	Priority / Roundabout	LOS B and D in AM and PM respectively	LOS B and A in AM and PM respectively	2,320 veh	13.1%	2.0%	0.1%	2.1%	1.5%	0.7%	1.3%	1.6%
Lowes Road / Dunns Crossing Road	Priority	Priority / Roundabout	LOS A in both AM and PM	LOS A in both AM and PM	2,690 veh	30.9%	3.1%	0.0%	4.9%	0.9%	0.4%	0.6%	1.2%
Lowes Road / Levi Drive / Masefield Drive	Roundabout	Signals in both years	LOS B and C in AM and PM respectively	LOS C in both AM and PM	4,300 veh	3.4%	1.6%	0.1%	2.1%	4.6%	1.7%	0.4%	3.4%
Springston Rolleston Road / Selwyn Road	Priority	Roundabout in both years	LOS A in both AM and PM	LOS A in both AM and PM	3,080 veh	5.9%	10.1%	0.0%	3.1%	1.1%	0.6%	0.4%	3.1%
Selwyn Road /Weedons Road	Priority	Roundabout in both years	LOS A in both AM and PM	LOS A in both AM and PM	4,270 veh	4.1%	4.9%	0.0%	1.7%	1.3%	1.4%	0.3%	4.8%
Walkers Road / Two Chain Road	Priority	Roundabout in both years	LOS A in both AM and PM	LOS A in both AM and PM	970 veh	6.9%	1.3%	0.2%	1.6%	0.6%	0.2%	0.3%	0.7%
Goulds Road /East Maddisons Road	Priority	Priority / Roundabout	LOS A and B in AM and PM respectively	LOS A in both AM and PM	2,480 veh	9.5%	8.6%	0.0%	13.6%	2.2%	1.0%	1.2%	2.1%

APPENDIX A - Predicted PPC73 Trip Distribution

	SH1 East	SH1 West	South	Selwyn Rd East	North	within Rolleston
Total AM	24%	4%	11%	9%	13%	40%
Total PM	17%	3%	9%	6%	10%	55%

Reference: P:\SDCX\001 PC73 Dunns Crossing\Reporting\TN1A210809.docx - Qing Li

APPENDIX C Traffic modelling Select Link Analysis


Two Chain Road
SH1 East
SH1 West
Levi Road
Lincoln Rolleston Road
Dunns Crossing Road
Selwyn Road
Selwyn Road
430
430
40
220
140
490
210
100
570
120
150
100
540
60
210
170
230
AM_Zone201_203 OD Route
07:00 to 08:00
1.0 to 322.0


320
SH1 East
Two Chain Road
430
30
Levi Road
SH1 West
180
110
490
160
140
Lincoln Rolleston Road
60
120
620
100
600
90
Dunns Crossing Road
240
190
Selwyn Road
250
Selwyn Road
PM_Zone201_203 OD Route
17:00 to 18:00
1.0 to 308.8