Private Plan Change 69: Rolleston Industrial Developments Ltd

Transportation Hearing Report

October 2021

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TRANSPORTATION SPECIALISTS

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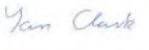
14 October 2021	For Council comment	R1A211014	I Clark	
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SUMMARY OF MY PEER REVIEW

Selwyn District Council (Council) has requested Flow Transportation Specialists (Flow) to review the transportation matters associated with Private Plan Change 69 (PPC69), which has been lodged by Rolleston Industrial Developments Ltd.

Key transport matters identified in my review are

- The safety and efficiency effects of PPC69 on the Lincoln transport network, and what intersection and road upgrades are required to support PPC69
- Connectivity of the Outline Development Plan within the site, and to the adjacent existing and future transport network
- Consideration of the Rolleston Structure Plan.

In terms of the immediate effects of PPC69, and the proposed ODP

- I have concerns about the methodology used in the 2031 Lincoln Paramics model regarding the peak hour traffic effects of PPC69 on the Lincoln transport network (refer to my discussion in Section 5.1)
    - The traffic generation of PPC69 may be under predicted by up to 400 vehicles per hour in the PM peak and 600 vehicles per hour in the AM peak
    - The traffic distribution for PPC69 is not consistent with similar residential development zones within Lincoln, and may therefore affect the reported performance of critical intersections such as Springs Road / Ellesmere Junction Road / Gerald Street
- The ITA indicates that the Springs Road / Ellesmere Junction Road / Gerald Street intersection cannot accommodate the traffic generated by PPC69, either in its current form as a roundabout or as a signalised intersection as proposed by Council's future Gerald Street upgrade project. The additional traffic modelling provided as part of the Clause 23 response indicates that the intersection can accommodate the traffic generated by PPC69, however I have concerns about several assumptions used in the updated traffic modelling. In my view, there is insufficient rigour in the assessment of potential effects from PPC69 on this intersection. Refer to my discussion in Section 5.2
- There has been insufficient consideration of the effects of PPC69 on Springs Road, between Lincoln and Prebbleton. Traffic modelling indicates a significant increase in traffic due to PPC69, which in turn may affect safe turning movements at intersections. Refer to my discussion in Section 5.3
- There has been insufficient consideration of the effects on Springs Road, between PPC69 and Gerald Street. Traffic modelling indicates that Springs Road will be reaching capacity for an urban road, which in turn will affect turning movements at intersections and pedestrian/cyclist crossing opportunities. Refer to my discussion in Section 5.4
- The Edward Street / Ellesmere Road / Lincoln Tai Tapu Road intersection is indicated to operate acceptably once traffic from PPC69 is added. Council has programmed an upgrade of this intersection to a roundabout in 2024/2025, which will address existing sight line issues for the

Ellesmere Road (south) approach. I consider that this upgrade should be in place prior to any development within PPC69, otherwise unmitigated safety effects may result due to additional vehicle movements through this intersection. Refer to my discussion in Section 5.5

- I recommend that the two proposed accesses from PPC69 to Springs Road are identified in the ODP as roundabouts/signals. Refer to my discussion in Section 5.6
- I recommend that a planning mechanism is provided, requiring the applicant to upgrade Ellesmere Road between Moir Lane and Edward Street to a Collector Road standard in conjunction with any road connection from PPC69 to Moir Lane. Further, I recommend that no development occurs within PPC69 until Council's seal widening of Ellesmere Road, between Edward Street and Knights Stream Bridge is completed. Refer to my discussion in Section 5.7.1
- I consider that the application does not provide sufficient information to determine the feasibility of the upgrade of Moir Road to Collector Road standard, including providing for existing Rail Trail link and crossing point on Ellesmere Road. Until such information is provided, I am unable to support PPC69. Should the upgrade be determined to be feasible, I recommend that a planning mechanism is provided requiring the applicant to undertake the following works in conjunction with any development within PPC69. Refer to my discussion in Section 5.7.2
    - Construction of a road connection between any development within PPC69 and Moir Lane
    - Upgrade of the existing Moir Lane to Collector Road standard, including Rail Trail facilities
    - Upgrade of Ellesmere Road to Collector Road standard between, and including the intersections of, Moir Road and Edward Street
- I recommend that the ODP identify the requirement for a gateway treatment for Springs Road. Refer to my discussion in Section 5.8
- Should the upgrade of Moir Lane not be feasible, Collins Road may be an appropriate alternative access to PPC69. Should the Collins Road corridor be used to access Ellesmere Road, I recommend that a planning mechanism is provided requiring the applicant to undertake the following works in conjunction with any development within PPC69. Rrefer to my discussion in Section 5.8
    - Construction of a road connection between any development within PPC69 and Collins Road
    - Upgrade of Collins Road to Collector Road standard between, and including the intersections of, Spring Road and Ellesmere Road
    - Upgrade of Ellesmere Road to Collector Road standard between, and including the intersections of, Collins Road and Edward Street
- The potential future roading connections to Verdeco Park and Te Whāriki subdivisions, shown in the ODP, have been precluded by consented subdivisions. The potential future roading connection to Liffey Springs Road is feasible, however would require an alignment through a Council reserve and not proposed by PPC69. I consider that PPC69 will not be well connected to surrounding urban developments and will primarily rely on Springs Road and Ellesmere Road to connect with the existing Lincoln urban area. As a result, I consider that PPC69 will have poor

connectivity to adjoining urban areas, and lower active and public transport usage. efer to my discussion in Section 5.9

- I recommend that the ODP indicates frontage upgrades for Springs Road and Collins 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. Refer to my discussion in Section 6.1
- PPC69 is inconsistent with the Lincoln Structure Plan, in that it is outside the anticipated urban area. Should PPC69 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. However, assessing the effects of such development on the long term planning and funding commitments associated with bulk transport infrastructure is complex and requires assessment of multiple land use scenarios. Refer to my discussion in Section 7.

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

- I recommend that Council consider the proportional effect that PPC69 will have on network hotspots and assumed intersection improvements contained in the 2031 Lincoln Paramics model, as identified in Table 2. Council should consider whether the proportional effects of PPC69 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. Refer to my discussion in Section 4.

Overall, I consider the assessment of potential transport effects resulting from PPC69 have not been adequately considered, as such I cannot support PPC69 at this stage.

CONTENTS

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.

Rolleston Industrial Developments Limited (requestor) has lodged a PPC to change the Selwyn District Plan to rezone approximately 190 hectares of Rural Outer Plains zoned land to a mix of Living C, Living Z and Business 1 zone (PPC69). This report details my review of PPC69.

The scope of this specialist transport report is to assist Council in determining the transport outcomes of PPC69 and includes the following

- A summary of PPC69 focusing on transport matters
- An overview of transport projects contained within the Long Term Plan (LTP), which are relevant to PPC69
- A summary of the modelled traffic effects indicated by Council's 2031 Lincoln Paramics model
- A review of the material provided to support the application for PPC69, and discussion of the potential effects of PPC69
- 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 Limited, dated 7 April 2021, including
    - Appendix D Integrated Transport Assessment, prepared by Novo Group, October 2020
- Response to Council information requests, prepared by Novo Group, dated 18 February 2021
- Third party traffic model files, as discussed in Section 4
- Submissions as outlined in Section 8.

2 A SUMMARY OF PPC69

There are currently multiple private plan changes lodged within Rolleston, Lincoln and Prebbleton, as shown in Figure 1. PPC69 is south of the Verdeco and Te Whāriki subdivision, which are currently under construction and partially occupied.

PPC69 proposes to rezone approximately 190 hectares of Rural Outer Plains zoned land to a mix of Living C, Living Z and Business 1 zone. An Outline Development Plan (ODP) is proposed to guide the form and layout of future development.

The ODP is shown in Figure 2 and Figure 3 and is intended to provide

- Approximately 2,000 residential lots
- A minor neighbourhood centre
- Primary vehicle access from Springs Road
- Secondary accesses via Moirs Lane, Collins Road, Liffey Springs Drive and internal road networks of the Te Whāriki and Verdeco Park subdivisions.

Figure 1: Overview of PPC78 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: PPC69 Outline Development Plan in context with the surrounding transport network

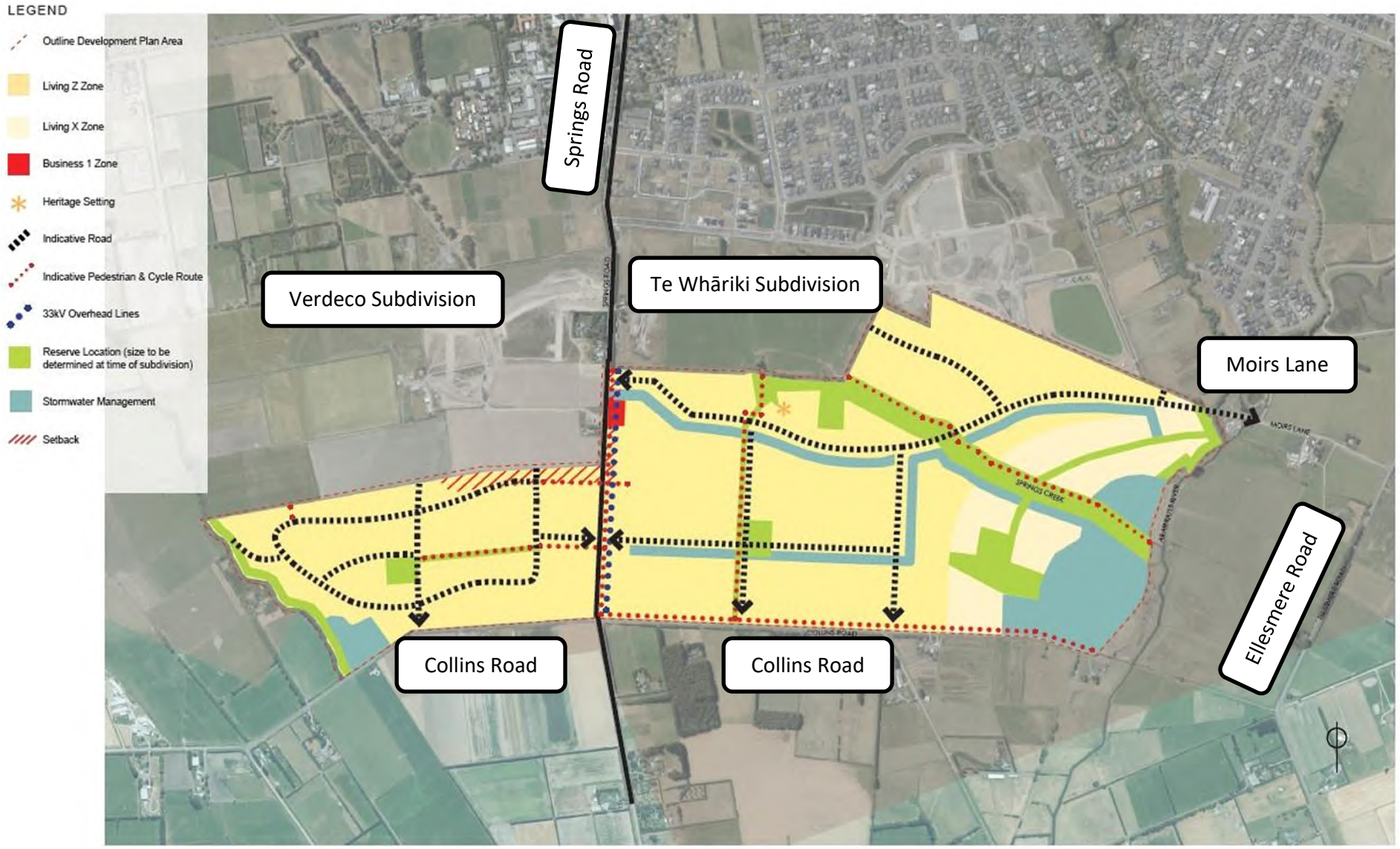
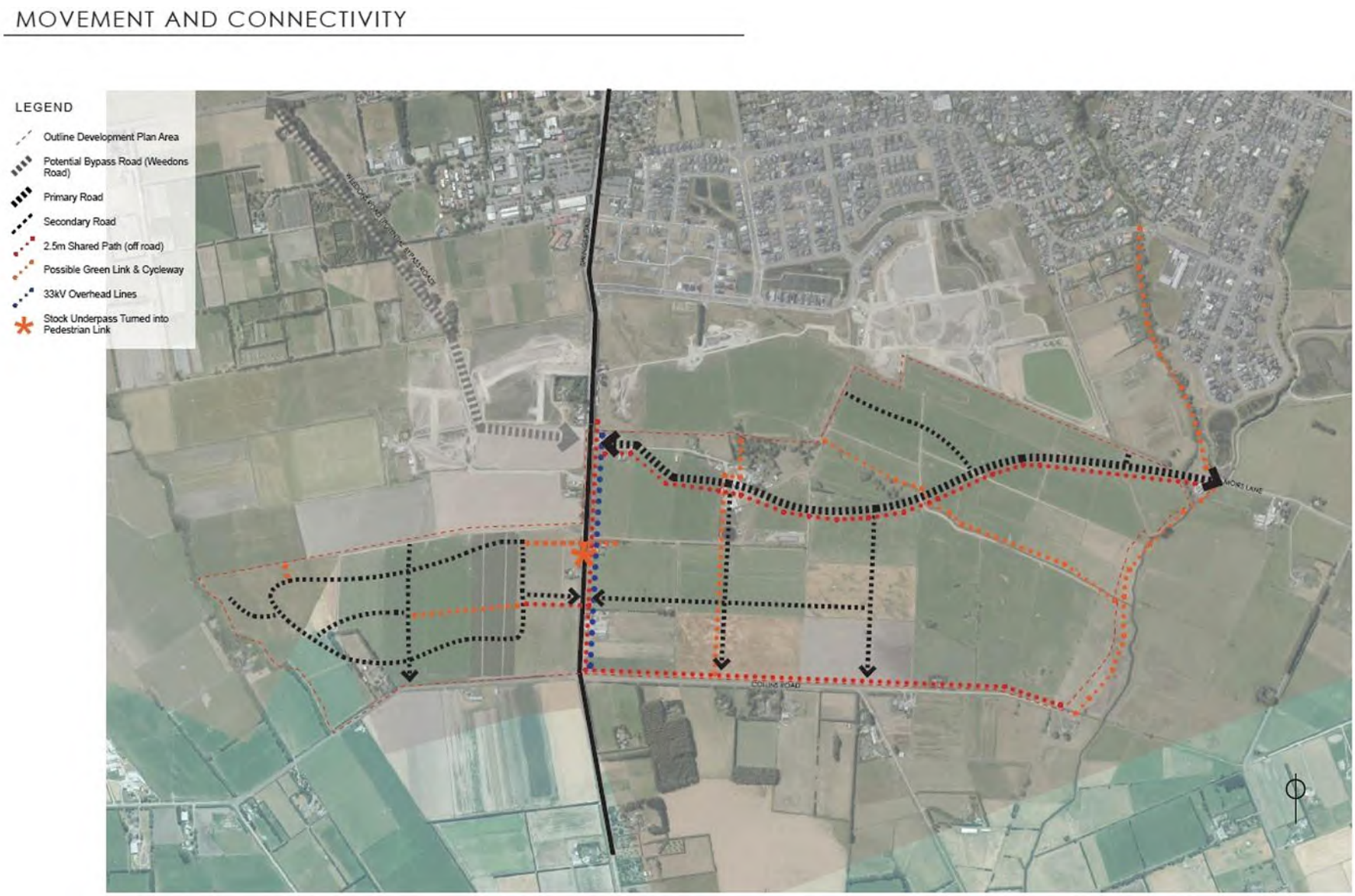


Figure 3: ODP movement and connectivity plan



3 LINCOLN TRANSPORT PROJECTS RELEVANT TO PPC69

This section discusses various funded and planned transport projects in Rolleston that have relevance to PPC78.

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 PPC69. I have reproduced these in Table 1 below. Further discussion of how PPC69 is anticipated to affect various parts of the transport network is provided in Section 4.

Table 1: LTP transport projects relevant to PPC69

Project	Scheduled year	Description	Relevance to PPC69
Ellesmere Road seal widening	2024/25	Seal widening and intersection upgrades between Edward St and Knights Stream Bridge, including a new roundabout for the Ellesmere Road/Edward Street/Lincoln Tai Tapu Road intersection	PPC69 contributes around 6% of peak hour traffic movements on this section of Ellesmere Road in 2031, and 7% of peak hour traffic movements at the Ellesmere Road/Edward Street/Lincoln Tai Tapu Road intersection in 2031
Meijer Drive extension	2025/26	Extension of Meijer Drive to Boundary Road to support improved public transport / park n ride	PPC69 will benefit from improved public transport accessibility.
Lincoln Town Centre upgrade: Lincoln Public Carpark Stage 1.	2025/26	Replacement town centre parking north of Gerald St	PPC69 will likely increase the walking, cycling, general traffic and parking demand on Gerald Street.
Lincoln Town Centre upgrade: Gerald Street / West Belt traffic signals	2027/28	Signalisation of the existing intersection, as part of the Gerald Street upgrade	
Lincoln Town Centre upgrade: Gerald Street upgrade (eastern end)	2027/28	Between Kildare Terrace and West Belt	
Lincoln Town Centre upgrade: Lincoln Public Carpark Stage 2	2028/29	Replacement town centre parking south of Gerald St	
Lincoln Town Centre upgrade: Gerald Street / Vernon Drive traffic signals	2029/30	Signalisation of the existing intersection, as part of the Gerald Street upgrade	
Lincoln Town Centre upgrade: Gerald Street upgrade transitional section	2029/30	Between West Belt and Veron Drive	

Lincoln Town Centre upgrade: Gerald Street / James Street / Edwards Street traffic signals	2034/35	Signalisation of the existing intersection, as part of the Gerald Street upgrade	
Lincoln Town Centre upgrade: Gerald Street upgrade western end	2033/34	Between Veron Drive and Springs Road	
Springs Road / Ellesmere Junction Road / Gerald Street traffic signals	2033/34	Signalisation of the existing intersection, as part of the Gerald Street upgrade	PPC69 contributes around 14% of peak hour traffic movements in 2031

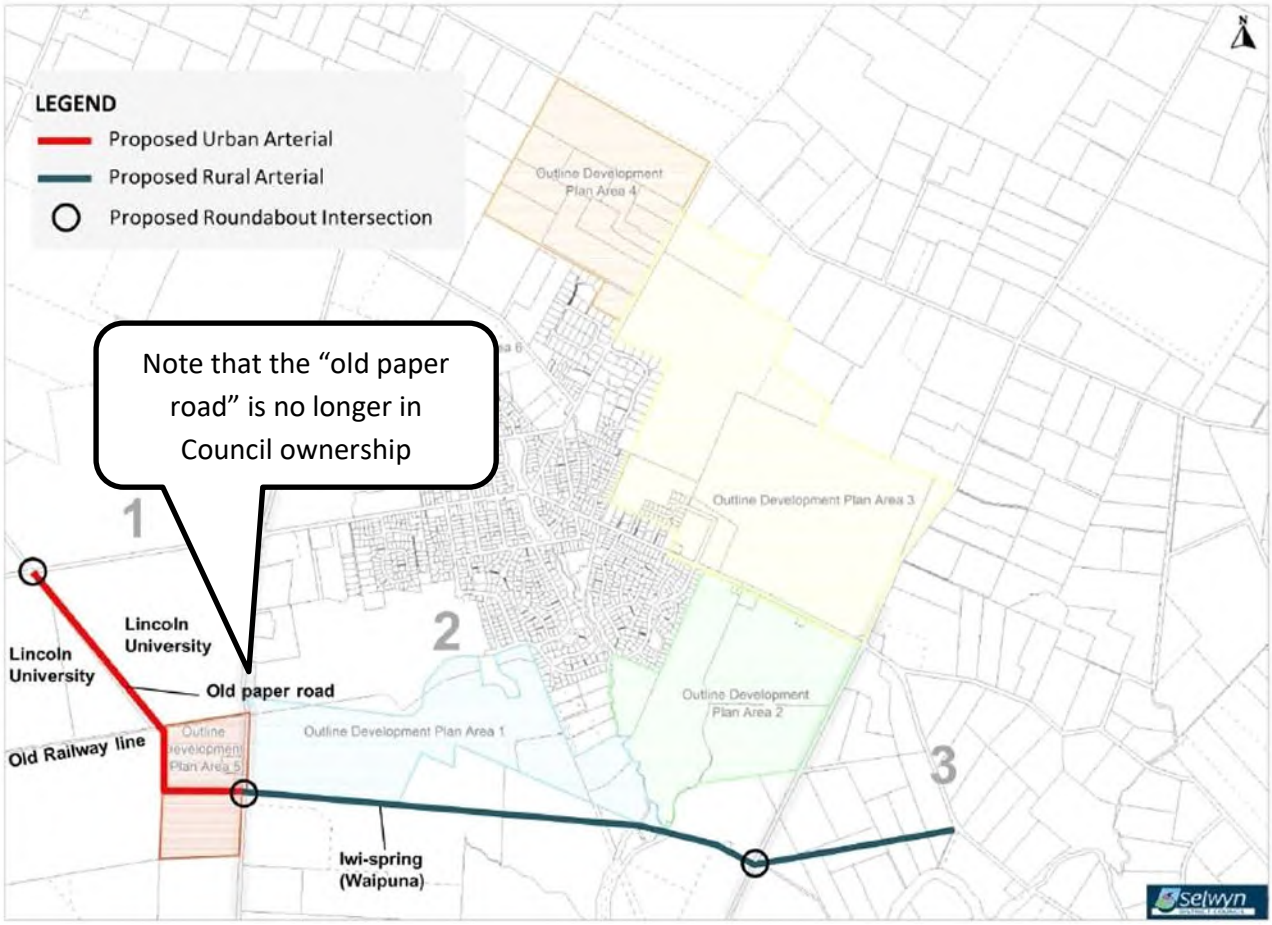
3.2 Lincoln Southern Bypass

The Movement and Connectivity Plan included in the ODP, shown in Figure 3, includes "Weedons Road Potential Bypass Road", shown outside of the boundaries of PPC69. Paragraph 27 of the ITA also notes that PPC69 provides for the proposed Lincoln bypass through PPC69.

In 2014 Council undertook a feasibility assessment of this link, as shown in Figure 4, and determined that it did not warrant further investigation. I understand that this was due to a combination of poor soil conditions, high water tables and natural flowing (and culturally sensitive) springs within the area, along with property ownership complexities and a high cost relative to anticipated use.

The Lincoln Paramics model, discussed in Section 4 below, assesses 2031 scenarios with and without this link. Due to the infeasibility of this link, I have not reported on the results of the 2031 scenario model that includes the link. Therefore, although the ODP shows a roading link that is unlikely to eventuate, this does not affect my reporting of traffic modelling results in the following sections of my report.

Figure 4: Scope for Councils 2014 Southern Bypass study



4 MY REVIEW OF TRAFFIC MODELLING FOR THE LINCOLN AREA

Flow has also used the South Lincoln Private Plan Change Paramics model (as summarised in the Abley memo "South Lincoln Private Plan Change Modelling", dated 12 February 2021) to assess the potential effect of planned urban growth within Lincoln

We note that two network scenarios have been modelled for PPC69, one with and one without the Lincoln Southern Bypass between Springs Road and Ellesmere Junction Road. As discussed in Section 3.2, we only discuss the scenario without the bypass in our report.

4.1 PPC69 proportion of the cumulative network effects of growth

The 2031 Lincoln Paramics model identifies that the following intersections will be operating near to or over capacity by 2031 if PPC69 proceeds

- Springs Road / Farm Road Intersection (private road owned by Lincoln University)
- Springs Road / Engineering Drive Intersection (private road owned by Lincoln University)
- Springs Road / Gerald Street / Ellesmere Junction Road Intersection (predicted to operate acceptably, however actual delays are higher than reported, see further discussion below).

To determine the extent to which PPC69 is contributing to the capacity effects at these intersections, Flow interrogated the traffic flows generated by PPC69 as a proportion of the modelled vehicle flow through each intersection (presented as the combination of both the 1 hour AM and PM peak hour flows, which are generally between 8am-9am and 5pm-6pm). Further, we have included intersections where improvements have been assumed in the 2031 Lincoln Paramics (for example signalisation or conversion to a roundabout). These results are presented in Table 2.

In relation to intersections with indicated congestion/high delays in 2031

- Springs Road/Farm Road Intersection currently only allows for pedestrian access but has been represented as a vehicle access in the model. The model indicates Level of Service (LOS) F with PPC69 traffic, while LOS B or C are predicted without PPC69 traffic. We note that very modest traffic volumes are predicted for the traffic movement, with LOS F (right turn from Farm Road, with 5 vehicles per hour predicted in AM peak). Farm Road is a private road owned by Lincoln University, therefore Council has limited ability to change the layout of this intersection
- Springs Road / Engineering Drive intersection is indicated to operate at LOS F in the AM peak, for the right turn movement from Springs Road north to Engineering Drive. LOS B or A are predicted at the intersection without the plan change traffic. PPC69 has a significant effect on this intersection (23% of total traffic movements), refer to my discussion in Section 5.4. Farm Road is a private road owned by Lincoln University, therefore Council has limited ability to change the layout of this intersection
- Springs Road / Gerald Street /Ellesmere Junction Road: this intersection is indicated to operate at LOS D and C on the Ellesmere Junction Road west and Springs Road south approach respectively in the morning peak. However, we consider that the traffic model is underreporting the potential

delays on these approaches, as discussed in Section 5.2. PPC69 has a significant effect on this intersection (14% of the total traffic movements).

In relation to intersections that are not indicated to have congestion/high delays in 2031, but are assumed to have improvements

- James Street / Gerald Street / Edward Street is assumed to be upgraded from a priority intersection to a signalised intersection, which is consistent with Council's upgrade of Gerald Street, indicated in Table 1. PPC69 generates around 6% of total peak hour movements through this intersection.

Information on the proportional effect of PPC69 may assist Council in its consideration of how the PPC 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 2031 Lincoln Paramics model).

Outcome: I recommend that Council consider the proportional effect that PPC69 will have on network hotspots and assumed intersection improvements contained in the 2031 Lincoln Paramics model, as identified in Table 2. Council should consider whether the proportional effects of PPC69 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.

Table 2: Future network hotspots, planned Council projects, and PC69 effects

Intersection	Existing Layout	Intersection form assumed in model	2031 performance with PPC69	**2031 traffic movements With all PPCs (AM and PM combined)**	**Percentage of traffic associated with PC69 as a proportion of total traffic movements through each intersection (AM and PM combined)**
Intersections with congestion/high delays in the 2031 South Lincoln Private Plan Change Paramics model					
Springs Road / Farm Road	Pedestrian Only	Priority	LOS F and D in AM and PM respectively	2,870 veh	22%
Springs Road / Engineering Drive	Priority	Priority	LOS F and C in AM and PM respectively	2,780 veh	23%
Springs Road / Gerald Street / Ellesmere Junction Road	Roundabout	Signals	LOS C in both AM and PM[2]	4,520 veh	14%
Intersections with different layouts (compared to the existing intersection layout) in the 2031 South Lincoln Private Plan Change Paramics model					
James Street / Gerald Street / Edward Street	Priority	Signals	LOS B in both AM and PM	3,060 veh	6%
Edward Street / Ellesmere Road / Lincoln Tai Tapu Road	Priority	Roundabout	N/A	1,670 veh	7%

[2] Under-represented delays at this intersection, refer to our discussion in Section 5.2.

5 MY REVIEW OF THE TRAFFIC EFFECTS

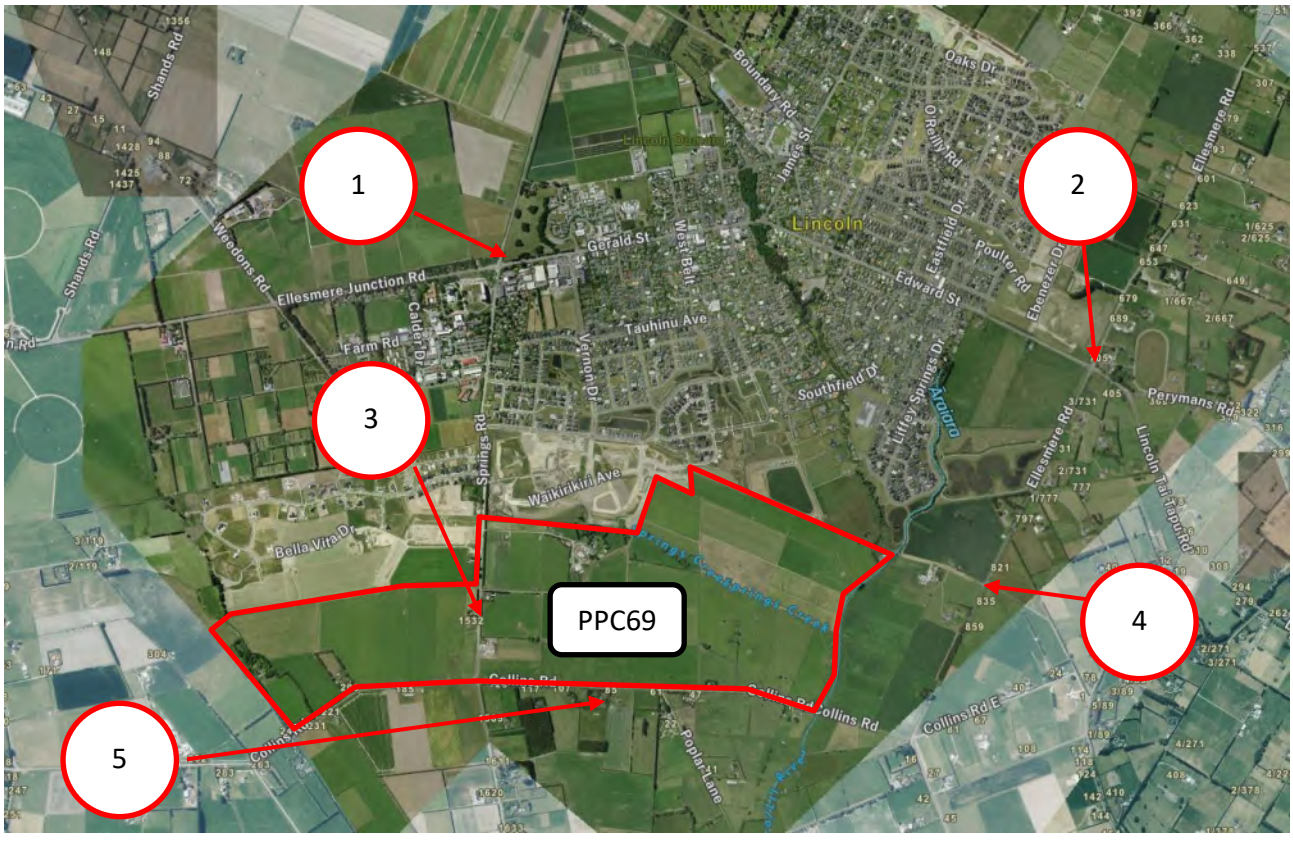
The ITA discusses the following aspects of the existing and future transport environment (shown in Figure 5)

1. Springs Road / Ellesmere Junction Road / Gerald Street
2. Edward Street / Ellesmere Road / Lincoln Tai Tapu Road
3. Site access / Springs Road intersections
4. Ellesmere Road / Moirs Lane intersection
5. Site access / Collins Road intersections
6. Potential links to Verdeco Park, Te Whāriki and Liffey Springs Road.

The ITA provides an assessment of these locations based on 2020 traffic data, with the addition of traffic that is predicted to be generated by PPC69 at full development. As discussed in Section 4, I have reviewed the 2031 Lincoln Paramics model, which includes PPC69 as well as growth within other future urban areas in Lincoln.

I discuss my review of these intersections, and others, in the following subsections and note any differences between the ITA SIDRA model results and the 2031 Lincoln Paramics model results where relevant.

Figure 5: Intersections assessed in the ITA



5.1 Lincoln Paramics Model: applicant assumptions

We have interrogated the Lincoln Paramics traffic model, which was used to support the applicant's responses to Council's Clause 23 information requests. We note the following assumptions that the applicant has incorporated within in the model, which may be resulting in underpredicting of traffic effects

- The model assumes that PPC69 will generate 0.7 veh/hr/dwelling, which is discussed in paragraphs 45 – 49 of the ITA. However, it is not clear why this rate has been used when the Rolleston Paramics model that is being used to assess the multiple private plan changes occurring in Rolleston uses 0.9 veh/hr/dwelling. As a result, the model is potentially underpredicting traffic generation by PPC69 by around 400 veh/hr (1,400 veh/hr vs 1,800 veh/hr), when compared with the assumptions applied to other urban fringe areas in Rolleston. Further, I also note that the traffic demands included in the PM peak (5-6 pm) model for PPC69 are lower than the modelled AM peak demands (1,200 vehicle trips, vs 1,400 vehicle trips).
- The traffic distribution of PPC69 predicted in the 2031 Lincoln Paramics model has been compared against the traffic distribution of the existing residential area south of Gerald Street (Zone 101, 102 and 103 within the Paramics model) for both base year (2016) and 2031. We note the distribution of the AM peak traffic demands from PPC69 to the external zones are different to those indicated for the Gerald Street residential areas. PPC69 has a much greater proportion of trips to and from the north, which affects the number of turning movements at the Springs Road / Ellesmere Junction Road / Gerald Street intersection.

Outcome: I have concerns about the methodology used in the 2031 Lincoln Paramics model regarding the peak hour traffic effects of PPC69 on the Lincoln transport network

- ***The traffic generation of PPC69 may be under predicted by up to 400 vehicles per hour in the PM peak and 600 vehicles per hour in the AM peak***
- ***The traffic distribution for PPC69 is not consistent with similar residential development zones within Lincoln, and may therefore affect the reported performance of critical intersections such as Springs Road / Ellesmere Junction Road / Gerald Street.***

5.2 Springs Road / Ellesmere Junction Road / Gerald Street intersection

The Springs Road / Ellesmere Junction Road / Gerald Street is located to the north of PPC69 and is currently a single lane roundabout.

As identified in Table 1, the intersection is programmed to be upgraded to a signalised intersection in 2033/34. Our review of the 2031 Lincoln Paramics model indicates that PPC69 contributes some 22% of peak hour traffic movements at this intersection by 2031.

The ITA has assessed several scenarios, all of which include existing traffic volumes plus anticipated traffic from the Verdeco Park and Te Whāriki subdivisions. The ITA indicates that

- the existing roundabout operates acceptably, although it is reaching practical capacity
- the existing roundabout will operate over-capacity once PPC69 traffic is added

- the signalised intersection, based on Council's proposed upgrade identified in Table 1, operates over-capacity once PPC69 traffic is added.

The ITA tested a larger signalised intersection with 4 to 6 lanes on each arm, which it found operates acceptably once PPC69 traffic is added. The ITA notes that this intersection form would require land acquisition from third parties. I consider that this intersection form is not feasible, as it is unlikely that the land acquisition would proceed based on existing property uses.

In response to Council clause 23 information requests, additional traffic modelling information was provided[3] using the 2031 Lincoln Paramics model, which indicated that the future signalised intersection planned by Council will operate acceptably once PPC69 traffic is added. The reason for this difference vs the ITA modelling result was reported to be due to changes in the modelling methodology to better reflect rerouting due to delays.

Our review of the Lincoln Paramics model has identified that several aspects that are likely resulting in under reporting of delays at the intersection

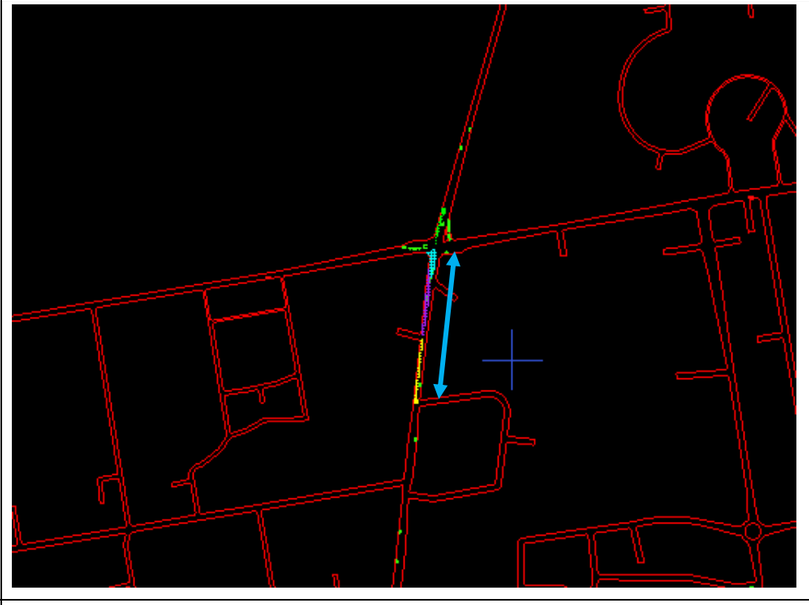
- the journey time path used to measure delays on the Springs Rd south approach only covers the length between Gerald Street and The Crescent (north). However, the modelled queue extends further south and often reaches Farm Road. As such, the actual delays experienced at the intersection will be greater than the delays reported in the Clause 23 response
- we observed the same issue on the Ellesmere Junction Road approach where queues were observed to extend further than the sections covered by the journey time path. We have shown screen shots of the model in Figure 6
- the modelling does not properly account for pedestrian crossing phases. Given the intersection is located close to Lincoln University, moderate pedestrian demand should be expected
- assumptions regarding the trip generation and distribution for PPC69, refer to my discussion in Section 5.1.

I consider that further assessment of this intersection is required, potentially using SIDRA traffic modelling software that adopts traffic flow outputs from the Lincoln Paramics model. Further, a sensitivity test should be undertaken that tests the effect of 0.9 veh/hr/dwelling for PPC69.

Outcome: The ITA indicates that the Springs Road / Ellesmere Junction Road / Gerald Street intersection cannot accommodate the traffic generated by PPC69, either in its current form as a roundabout or as a signalised intersection as proposed by Council's future Gerald Street upgrade project. The additional traffic modelling provided as part of the Clause 23 response indicates that the intersection can accommodate the traffic generated by PPC69, however I have concerns about several assumptions used in the updated traffic modelling. In my view, there is insufficient rigour in the assessment of potential effects from PPC69 on this intersection.

[3] PC200069: Lincoln South Transport Response to RFI, prepared by Novo Group, dated 16 February 2021

Figure 6: Springs Road/Gerald Street intersection Paramics model snips

	
Image showing modelled queue length (Springs Road approach)	Image showing extent of journey time path being measured (Springs Road approach)

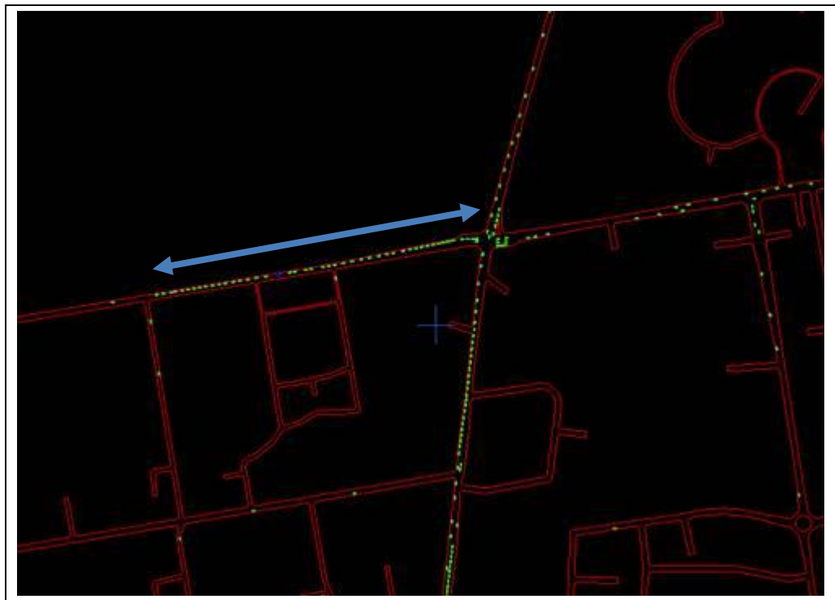



Image showing modelled queue length (Ellesmere Junction Road approach)	Image showing extent of journey time path being measured (Ellesmere Junction Road approach)

5.3 Springs Road (north of Gerald Street)

The ITA has not assessed the traffic effects on Springs Road (north of Gerald Street). I have investigated the traffic flows indicated in the 2031 Lincoln Paramics model and found that

- Without PPC69, traffic flows are expected to be 310 veh/hr and 275 veh/hr (northbound and southbound respectively) during the AM peak hour.
- With PPC69, the traffic flows increase to 755 veh/hr and 300 veh/hr (northbound and southbound respectively) during the AM peak hour.

In my view, the significant increase in mid-block traffic on Springs Road may affect safe turning movements, particularly at the intersection of Springs Road with Boundary Road, Tancreds Road, and Robinson Road.

Outcome: There has been insufficient consideration of the effects of PPC69 on Springs Road, between Lincoln and Prebbleton. Traffic modelling indicates a significant increase in traffic due to PPC69, which in turn may affect safe turning movements at intersections.

5.4 Springs Road (south of Gerald Street)

The ITA has not assessed the traffic effects on Springs Road (south of Gerald Street). I have investigated the traffic flows indicated in the 2031 Lincoln Paramics model and found that

- Without PPC69, traffic flows are expected to be 810 veh/hr and 900 veh/hr (both directions) during the AM and PM peak hour respectively
- With PPC69, the traffic flows increase to 1,480 veh/hr and 1,330 veh/hr (both directions) during the AM and PM peak hour, and up to 940 veh/hr in the northbound direction during the AM peak.

The increase in mid-block traffic on Springs Road may result in LOS E based on the Guide to Traffic Generating Developments (RMS Guide)[4]. This may affect

- Safe turning movements, particularly at the intersection of Springs Road with Southfield Drive, Verdeco Boulevard, and Waikirikiri Avenue
- Safe pedestrian/cyclist crossing movements, particularly at the intersections above and near Lincoln University.

Outcome: There has been insufficient consideration of the effects on Springs Road, between PPC69 and Gerald Street. Traffic modelling indicates that Springs Road will be reaching capacity for an urban road, which in turn will affect turning movements at intersections and pedestrian/cyclist crossing opportunities.

[4] Table 4.4, Urban Road Peak Hour Flows Per Direction

5.5 Edward Street / Ellesmere Road / Lincoln Tai Tapu Road intersection

The intersection of Edward Street / Ellesmere Road / Lincoln Tai Tapu Road is located to the north east of PPC69 and is currently a stop controlled intersection, with priority given to Edward Street (west arm) and Lincoln Tai Tapu Road (east arm).

The ITA identifies that there have been two non-injury crashes at this intersection between 2015 – 2020, both of which relate to northbound vehicles on Ellesmere Road failing to give-way to westbound traffic on Lincoln Tai Tapu Road. I investigated the available sight distance at this intersection based on aerial and streetview images and estimate that there is approximately 170m sight distance available for northbound drivers on Ellesmere Road (as shown in Figure 7), which is partially obstructed by power poles.

Austroads Part 4A – Unsignalised and Signalised Intersections Section 3.2.2 identifies how to calculate the minimum Safe Intersection Sight Distance at intersections. Based on this guidance, I calculate that approximately 180m of sight distance is required for drivers on Ellesmere Road based on the 80 km/hr speed limit on Lincoln Tai Tapu Road. This means the existing sight line is around 10m less than the minimum safe sight distance.

Figure 7: desktop sight line assessment for Ellesmere Rd approach to Edward St/Lincoln Tai Tapu Rd intersection

As identified in Table 1, the intersection is programmed to be upgraded to a roundabout in 2024/25. The roundabout upgrade proposed by Council will address the existing sight line deficit discussed above. Our review of the 2031 Lincoln Paramics model indicates that PPC69 contributes some 7% of peak hour traffic movements at this intersection by 2031.

The ITA has modelled several scenarios for this intersection, all of which include existing traffic volumes plus anticipated traffic From the Verdeco Park and Te Whāriki subdivisions. We have summarised the modelling results below

- The ITA modelling indicates that the existing intersection will operate acceptably once PPC69 traffic is added

- The ITA modelling indicates that the future roundabout (proposed by Council) will operate acceptably once PPC69 traffic is added
- The 2031 Lincoln Paramics model indicates that this intersection will operate acceptably in 2031, with anticipated traffic growth including PPC69.

The ITA notes that the existing crossroad intersection performs acceptably from an efficiency perspective once traffic from PPC69 is added, however it notes that PPC69 traffic movements will primarily be on the minor arms, which are the least safe movements. Given the existing sight line deficiency for the southern minor leg (Ellesmere Road), I recommend that this intersection be upgraded to a roundabout prior to any development within PPC69.

Outcome: The Edward Street / Ellesmere Road / Lincoln Tai Tapu Road intersection is indicated to operate acceptably once traffic from PPC69 is added. Council has programmed an upgrade of this intersection to a roundabout in 2024/2005, which will address existing sight line issues for the Ellesmere Road (south) approach. I consider that this upgrade should be in place prior to any development within PPC69, otherwise unmitigated safety effects may result due to additional vehicle movements through this intersection.

5.6 Site access/Springs Road intersections

Paragraph 28 of the ITA identifies that the two proposed accesses from PPC69 to Springs Road are anticipated to be roundabouts, however in its clause 23 responses, Novo Group identify that the "primary access" has been modelled as traffic signals. In my view a roundabout is more appropriate in this location, as it will encourage lower vehicle speeds through the intersection.

I support the ITA's recommendation for roundabouts at these intersections as this supports safer traffic movements and better opportunities for safe pedestrian and cycle crossing points. I recommend that this is identified on the ODP, refer to my recommended amendments in Figure 10.

Outcome: I recommend that the two proposed accesses from PPC69 to Springs Road are identified in the ODP as roundabouts.

5.7 Ellesmere Road / Moir Lane

Moir Lane and Ellesmere Road are proposed to be a key access to PPC69. As these two roads will essentially operate as a single corridor, I discuss them together in the following subsections.

5.7.1 Ellesmere Road

Paragraphs 81 – 83 of the ITA discuss the need to upgrade Ellesmere Road between Moir Lane and Edward Street to accommodate the traffic generated by PPC69. I agree with this conclusion and recommend that a planning mechanism is provided, requiring the applicant to upgrade Ellesmere Road between Moir Lane and Edward Street to a Collector Road standard in conjunction with any road connection from PPC69 to Moir Lane.

As identified in Table 1, Ellesmere Road between Edward Street and Knights Stream Bridge is programmed for seal widening in 2024/25, to upgrade this corridor. I recommend that this widening be

undertaken prior to any development within PPC69. Our review of the 2031 Lincoln Paramics model indicates that PPC69 contributes some 6% of peak hour traffic movements on Ellesmere Road in 2031.

Outcome: I recommend that a planning mechanism is provided, requiring the applicant to upgrade Ellesmere Road between Moir Lane and Edward Street to a Collector Road standard in conjunction with any road connection from PPC69 to Moir Lane. Further, I recommend that no development occurs within PPC69 until Council's seal widening of Ellesmere Road, between Edward Street and Knights Stream Bridge is completed.

5.7.2 Moir Lane

Paragraphs 41 and 42 of the ITA identify that Moirs Lane will be upgraded to a Collector Road, and it identifies that existing width constraints exist along some sections of the corridor. I support the ITA's recommendation regarding the upgrade, and I note that the boundary to boundary width of Moirs Lane is less than 14m in some locations, as shown in Figure 8. Moir Lane also forms part of the Rail Trail network, and therefore any upgrade would need to include provision a higher quality of walking and cycling facilities than would otherwise be provided on a typical Collector Road.

Paragraph 29 of the ITA identifies that Ellesmere Road / Moir Lane intersection will require upgrading, however it does not discuss the intersection form nor provide traffic modelling to assess the performance of the intersection. I support the ITA's recommendation regarding the upgrade, however the width constraint of Moir Lane may affect the ability to provide an appropriate upgrade to this intersection.

In my view, given the existing width constraints for Moir Lane and the importance of Moir Lane as an alternative access to PPC69 (thus relieving some pressure on the Springs Road / Ellesmere Junction Road / Gerald Street intersection), a preliminary design for the upgrade of Moir Lane (including the intersection with Ellesmere Road and rail trail crossing) is required to determine whether it is feasible as a key access route to PPC69.

Should the preliminary design show that an upgrade to Moir Lane to Collector Road standard is feasible, I recommend that a planning mechanism be provided that requires the applicant to form a connection to Moir Lane and to upgrade Moir Lane, prior to any development with PPC69. My rationale for this is that the other main access route to PPC69 relies on the Springs Road / Ellesmere Junction Road / Gerald Street intersection, which is already at capacity as discussed in Section 5.2.

Figure 8: Moirs Lane corridor width

Outcome: I consider that the application does not provide sufficient information to determine the feasibility of the upgrade of Moir Road to Collector Road standard, including providing for existing Rail Trail link and crossing point on Ellesmere Road. Until such information is provided, I am unable to support PPC69. Should the upgrade be determined to be feasible, I recommend that a planning mechanism is provided requiring the applicant to undertake the following works in conjunction with any development within PPC69

1. ***Construction of a road connection between any development within PPC69 and Moir Lane***
2. ***Upgrade of the existing Moir Lane to Collector Road standard, including Rail Trail facilities***
3. ***Upgrade of Ellesmere Road to Collector Road standard between, and including the intersections of, Moir Road and Edward Street.***

5.8 Collins Road

Paragraph 30 of the ITA identifies that the three proposed accesses from PPC69 to Collins Road are anticipated to be priority controlled T-intersections, and that the detail of these intersections can be confirmed during future subdivision consents. I agree with these conclusions.

The 2031 Lincoln Paramics model predicts that the Springs Road/Collins Road intersection will have around 160 veh/hr and 180 veh/hr in the AM and PM peaks, which is relatively low. I investigated Waka Kotahi's crash data base and found that there has been 1 crash reported at this intersection within the last 5 years, which was a non-injury crash. I therefore consider that the ODP does not need to specifically identify any intersection upgrade.

However, I consider that, with the extension of the urban area, it is appropriate to include a gateway treatment to improve legibility for road users. Some details relating to thresholds are contained in the Land Transport Rule: Traffic Control Devices 2004 (TCD) and the Manual of traffic signs and markings part 2 (2008) (MoTSAM), however alternative solutions are possible. I recommend that the ODP identify the requirement for a gateway treatment for Springs Road, refer to my recommendations in Figure 10.

As discussed in Section 5.7, I consider that there is insufficient detail within the PPC69 application to determine whether the proposed upgrade to Moir Lane to Collector Road standard is feasible. An

alternative roading link between PPC69 and Ellesmere Road could be via Collins Road, including the unformed corridor east of Poplar Lane. If this link was formed, I consider that Collins Road (between Springs Road and Ellesmere Road) and Ellesmere Road (between Collins Road and Edward Street) would need to be formed to Collector Road standard.

Outcome: I recommend that the ODP identify the requirement for a gateway treatment for Springs Road.

Outcome: Should the upgrade of Moir Lane not be feasible, Collins Road may be an appropriate alternative access to PPC69. Should the Collins Road corridor be used to access Ellesmere Road, I recommend that a planning mechanism is provided requiring the applicant to undertake the following works in conjunction with any development within PPC69

1. ***Construction of a road connection between any development within PPC69 and Collins Road***
2. ***Upgrade of Collins Road to Collector Road standard between, and including the intersections of, Spring Road and Ellesmere Road***
3. ***Upgrade of Ellesmere Road to Collector Road standard between, and including the intersections of, Collins Road and Edward Street.***

5.9 Potential links to Verdeco Park, Te Whāriki and Liffey Springs Road

Paragraph 33 of the ITA identifies that potential transport links to surrounding urban areas are possible. I support these links where they are feasible, as they improve the permeability and connectivity of the transport network and will encourage more trips by walking and cycling and enable more efficient public transport services, however

- Some submitters have raised concerns with the potential link to Liffey Springs Drive, which I discuss further in Section 8. I note that the potential connection to Liffey Springs Drive is outside the scope of PPC69, and that the ODP only seeks to future proof for this connection rather than deliver it. If this connection was formed it would likely need to be led by Council, and the 2031 Paramics model indicates that it would result in around 200 additional vehicles per hour on Liffey Springs Road during the AM and PM peaks. I understand that Council is not planning to form this connection
- Roading connections to Verdeco Park have been precluded by consented subdivision
- Roading connections to Te Whāriki have been precluded by consented subdivision.

Outcome: The potential future roading connections to Verdeco Park and Te Whāriki subdivisions, shown in the ODP, have been precluded by consented subdivisions. The potential future roading connection to Liffey Springs Road is feasible, however would require an alignment through a Council reserve and not proposed by PPC69. I consider that PPC69 will not be well connected to surrounding urban developments and will primarily rely on Springs Road and Ellesmere Road to connect with the existing Lincoln urban area. As a result, I consider that PPC69 will have poor connectivity to adjoining urban areas, and lower active and public transport usage.

Figure 9: ODP "Movement and Connectivity" in context with adjacent subdivisions

6 MY CONSIDERATION OF OTHER TRANSPORT MATTERS

6.1 Frontage upgrades

Paragraphs 39 and 40 identify that Springs Road and Collins Road are proposed to be upgraded to 60 km/hr Collector/Local Road standard along the site frontages. I support these upgrades, however I consider that a lower speed limit may be more appropriate for an urban environment. Having said this, I consider that the detail of these upgrades can be confirmed during future subdivision consents.

I recommend that the ODP should indicate that these upgrades are required to be delivered by the developer, and I have suggested amendments to the OPD in Figure 10.

Outcome: I recommend that the ODP indicates frontage upgrades for Springs Road and Collins 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.

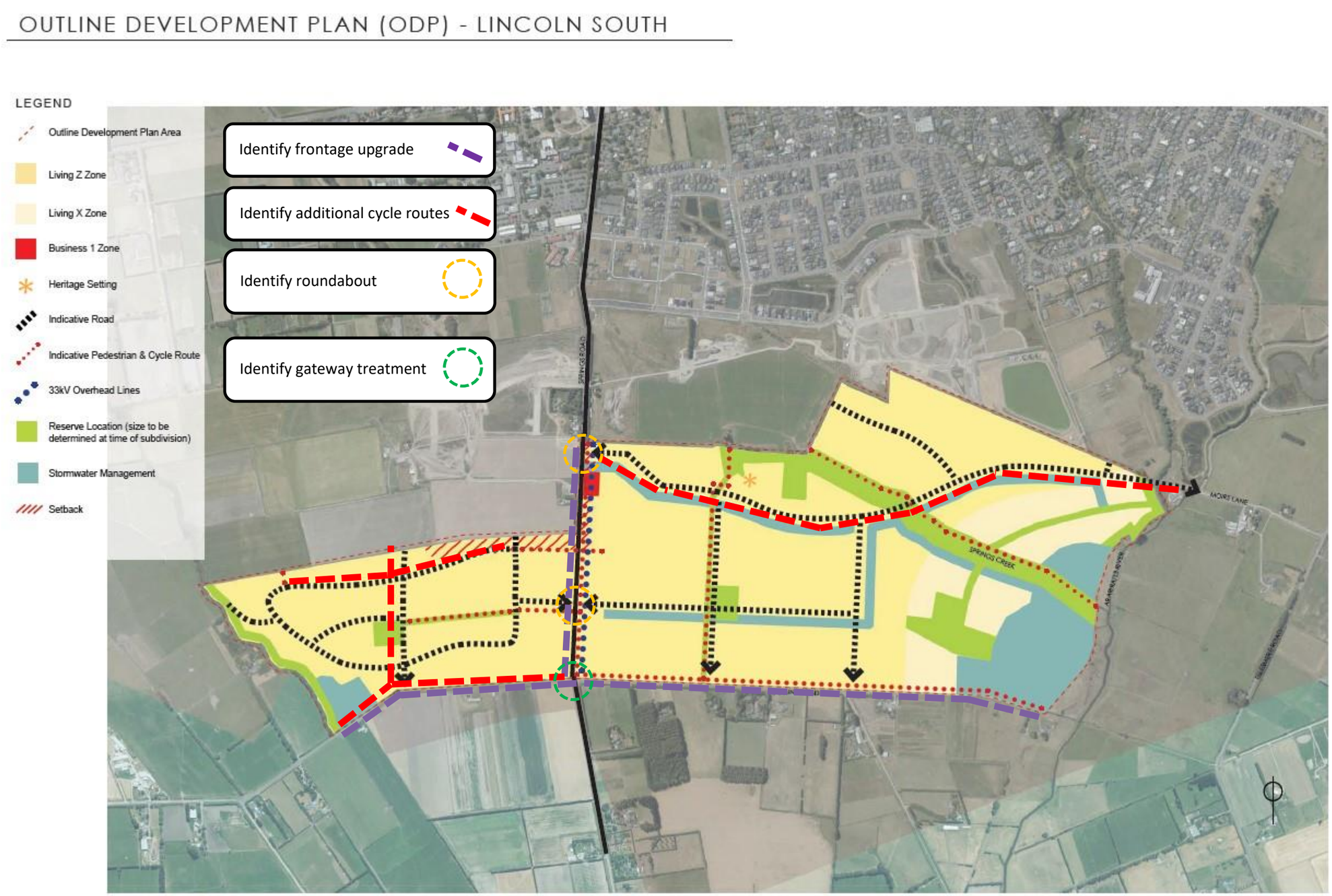
6.2 Provision for walking and cycling

Paragraphs 35 and 36 of the ITA discuss the extension of the 2.5m shared use path on Springs Road, along the frontage with PPC69 to Collins Road and along Collins Road. Greenlink connections are also identified along Collins Road and to the Verdeco Park and Te Whāriki subdivisions, as identified in the Movement and Connectivity Plan, shown in Figure 3.

I support these links and recommend that additional walking and cycling links are included within PPC69 to ensure a continuous network and enable greater uptake of walking and cycling. I have suggested amendments to the OPD in Figure 10.

Outcome: I recommend that the ODP should be amended to include additional walking and cycling routes within PPC69.

Figure 10: Recommended amendments to the ODP



7 THE LINCOLN STRUCTURE PLAN

As part of my review, I have considered the Lincoln Structure Plan (Structure Plan)[5]. The Structure Plan was prepared in 2008, and its purpose is to outline an urban design vision for the future development of Lincoln Township and to provide a strategic framework to guide the development process.

PPC69 sits outside the anticipated urban area of the Structure Plan, as shown in Figure 11, as well as the proposed infrastructure boundary specified in the Canterbury Regional Policy Statement (CRPS) Map A[6].

I regard to the potential effects of PPC69 on the wider transport network

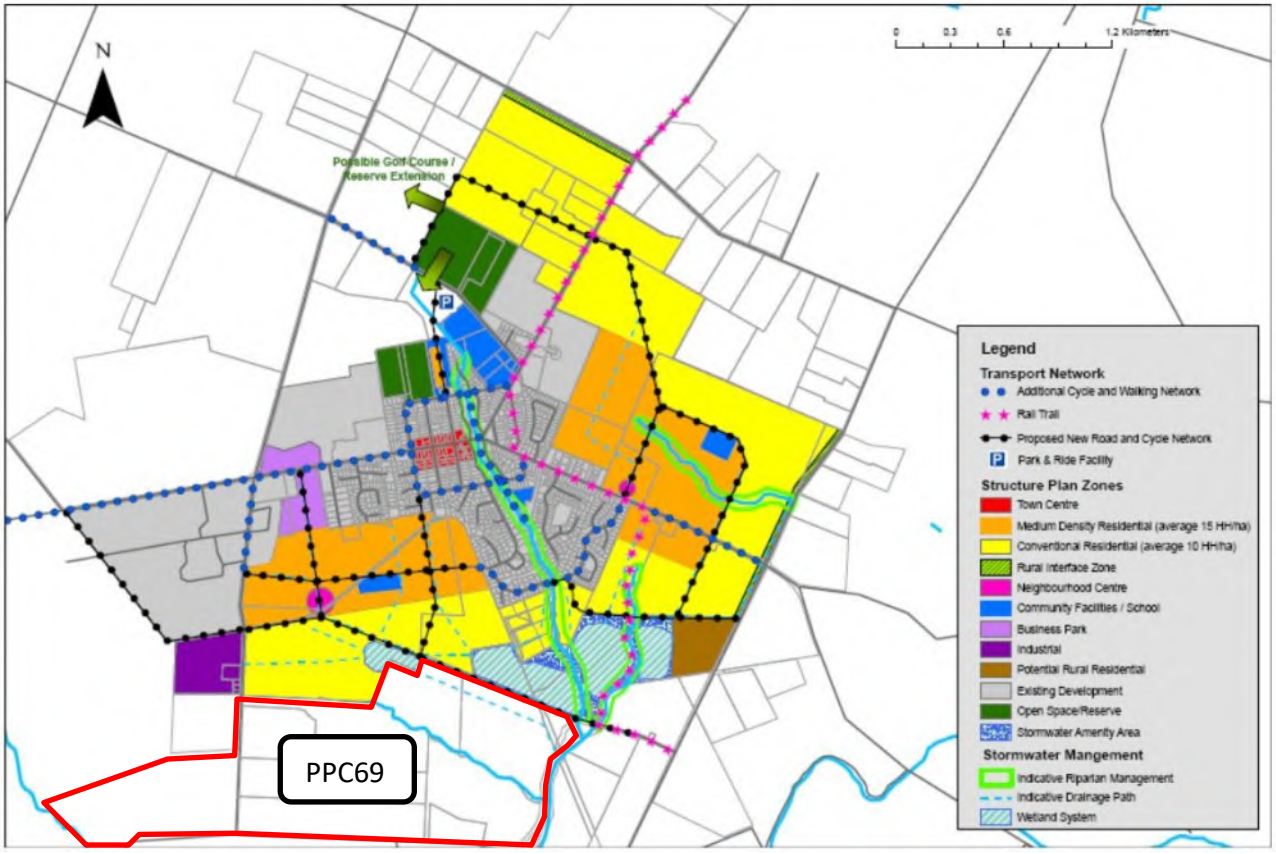
- The transport effects of PPC69 on the wider transport network, beyond Lincoln, have not been assessed in the ITA or Council's Lincoln Paramics traffic model
- If PPC69 does not affect the quantum of residential growth within Selwyn District over the life of the District Plan (i.e. residential growth in Selwyn District is a "zero sum game", with PPC69 drawing growth demand away from other parts of Selwyn), PPC69 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 PPC69 (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
- the wider area effects of PPC69 may not be overly apparent in a macro scale regional traffic model. Assessing the effects of PPC69, as a development outside of the identified infrastructure boundary, on the long term planning and funding commitments associated with bulk transport infrastructure is complex and requires assessment of multiple land use scenarios (e.g. expansion vs intensification scenarios).

Outcome: PPC69 is inconsistent with the Lincoln Structure Plan, in that it is outside the anticipated urban area. Should PPC69 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. However, assessing the effects of such development on the long term planning and funding commitments associated with bulk transport infrastructure is complex and requires assessment of multiple land use scenarios.

[5] Lincoln Structure Plan, available online https://www.selwyn.govt.nz/__data/assets/pdf_file/0011/10217/Final-Lincoln-Structure-Plan-May-08.pdfv

[6] Canterbury Regional Policy Statement Map A, available online https://www.ecan.govt.nz/your-region/plans-strategies-and-bylaws/canterbury-regional-policy-statement/

Figure 11: Lincoln Structure Plan with PPC69 location



8 MY REVIEW OF SUBMISSIONS

Multiple submissions were received relating to transport effects, including

- Provision of transport infrastructure
- Walking and cycling
- Public transport
- Roading connections
- Speed limits for existing roads.

I comment on these matters further in the following subsections.

Other matters related to traffic were identified in submissions, however I have not commented on these as I am not a subject matter expert for

- Traffic noise and pollution
- Greenhouse gas emissions from traffic
- Property effects resulting from internal road alignment.

8.1 Provision of transport infrastructure

Aspects of submissions that discussed the adequacy of existing and/or planned transport infrastructure, and my responses, are provided in Table 3.

Table 3: Commentary on submissions related to the provision of transport infrastructure

Submission point	Flow comment
General concern about the effects on existing roads	Refer to my summary of effects indicated in the 2031 Lincoln Paramics model in Section 4, and on the wider transport network in Section 7
Effects on Ellesmere Road and Ellesmere Road/Lincoln Tai Tapu intersection	Refer to my discussion in Section 5.3
Safety issue with community and commuters to the university	PPC69 will increase traffic on Springs Road, however in my view pedestrian/cyclist connectivity to Lincoln University is currently poor, with limited footpaths and pedestrian crossing points to the University.
Traffic hazards for traffic turning from Moirs Lane	Refer to my discussion in Section 5.7
Traffic danger to children near Ararira Springs School	I consider that PPC69 will generate limited traffic movements near Ararira Springs School, other than trips generated to/from the school itself. Regarding the roading link to Liffey Springs Road, refer to my discussion in Section 5.9.
Safety issues and busy intersection at Springs Road and Boundary Rd intersection	Refer to my discussion in Section 5.3

Effects on the transport network between Lincoln and Prebbleton, including Springs Road and Ellesmere Road	Refer to my discussion in Sections 5.2, 5.5, and 5.3
Concern about cross road intersections	Refer to my discussion in Section 5.6
Concern about high car dependency of PPC69	Refer to my discussion in Section 5.1
Condition of Ellesmere Road between Edward Street and Sabys Road	Refer to my discussion in Section 5.7
Concerns about the effects on access at existing Verdeco intersections with Springs Road	Refer to my discussion in Section 5.3
Effects on the transport network beyond Selwyn District, particularly key routes into Christchurch	Refer to my discussion in Section 7

8.2 Walking and cycling

Aspects of submissions that discussed walking and cycling infrastructure, effects on pedestrians and cyclists, and my responses, are provided in Table 4.

Table 4: Commentary on submissions related to walking and cycling

Submission point	Flow comment
Increased traffic on existing roads will prevent people from walking and cycling, including in Verdeco Park	Refer to my discussion in Sections 5.9 and 6.2
Encourage and incorporate active mode travel in roading design	I consider that the design of internal roads can be addressed at subdivision consent, and compliance to Council's standards and guidelines can be assumed.
High risk to active mode users at Little River Rail Trail crosses Ellesmere Road	Refer to my discussion in Section 5.7
Provide for walking and cycling connection to Allendale Lane /Southfield Drive/ Liffey Springs Road / Ararira School	I support these in principle, however I am unsure whether these links can be secured and provided through third party land.
Need for safe pedestrian crossing points on Springs Road	Refer to my discussion in Section 5.3

8.3 Public transport

Aspects of submissions that discussed public transport services, and my responses, are provided in Table 5.

Table 5: Commentary on submissions related to public transport

Submission point	Flow comment
The plan change does not include public transport and/or should provide public transport	In my view, the funding and implementation of a public transport system is a matter for Lincoln 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, nor is it likely that such services would be provided by a third party prior to any development occurring. I consider that the lack of connectivity to surrounding urban areas, as discussed in Section 5.9, may limit options to provide effective public transport services to PPC69.
Existing public transport services are poor	
More public transport services should be provided, including a park-n-ride	
Seeking a minimum density of 15 households/hectare to support public transport provisions.	I agree with the submitter that higher residential densities can support greater mode share for public transport. However, residential densities should be determined after considering a number of factors, not just public transport catchments. I am not opposed to higher densities, however I consider that this should be addressed via the land-use zoning applied to the site, rather than through specific mechanisms applied to PPC69. I note that even if higher density is permitted by the land use zoning that is applied, higher densities may not be realised unless there is a subsequent market demand for higher density in this location. Finally, the 2031 Lincoln Paramics model has assessed the stated yields of PPC69. Should yields be increased, Council would need to rerun the model to determine what effect a higher yield for PPC69 would have on the transport network.

8.4 Roading connections

Aspects of submissions that discussed roading connections, and my responses, are provided in Table 6.

Table 6: Commentary on submissions related to roading connections to PPC69

Submission point	Flow comment
Effects on Liffey Springs Dr and Edward St intersection	Refer to my discussion in Section 5.9
Concern about effects on the reserve at the end of Liffey Springs Road	
Require the Applicant to form the paper road into Moirs Lane and create an access from that road into Allendale Lane, and Liffey Springs;	Refer to my discussion in Sections 5.7 and 5.9
Concerns about the effects on existing roads in the Verdeco subdivision	Refer to my discussion in Section 5.9
Removing any reference to transport connections to Verdeco Park	

Make Collins Road the main eastern connection rather than Moirs Lane	Refer to my discussion in Sections 5.7 and 5.8
Opposition to the southern/western bypass, indicated on the ODP	Refer to my discussion in Section 3.2

8.5 Speed limits for existing roads

Some submitters raised concerns with the existing speed limit for roads near PPC69. I note that only the Road Controlling Authority can alter speed limits, and I expect the Council will reduce speed limits on Springs Road and Collins Road as urbanisation in PPC69 occurs.

9 SUMMARY AND CONCLUSION

I have reviewed the PPC69 application documents, responses to Council information requests, and submissions.

In terms of the immediate effects of PPC69, and the proposed ODP

- I have concerns about the methodology used in the 2031 Lincoln Paramics model regarding the peak hour traffic effects of PPC69 on the Lincoln transport network (refer to my discussion in Section 5.1)
    - The traffic generation of PPC69 may be under predicted by up to 400 vehicles per hour in the PM peak and 600 vehicles per hour in the AM peak
    - The traffic distribution for PPC69 is not consistent with similar residential development zones within Lincoln, and may therefore affect the reported performance of critical intersections such as Springs Road / Ellesmere Junction Road / Gerald Street
- The ITA indicates that the Springs Road / Ellesmere Junction Road / Gerald Street intersection cannot accommodate the traffic generated by PPC69, either in its current form as a roundabout or as a signalised intersection as proposed by Council's future Gerald Street upgrade project. The additional traffic modelling provided as part of the Clause 23 response indicates that the intersection can accommodate the traffic generated by PPC69, however I have concerns about several assumptions used in the updated traffic modelling. In my view, there is insufficient rigour in the assessment of potential effects from PPC69 on this intersection. Refer to my discussion in Section 5.2
- There has been insufficient consideration of the effects of PPC69 on Springs Road, between Lincoln and Prebbleton. Traffic modelling indicates a significant increase in traffic due to PPC69, which in turn may affect safe turning movements at intersections. Refer to my discussion in Section 5.3
- There has been insufficient consideration of the effects on Springs Road, between PPC69 and Gerald Street. Traffic modelling indicates that Springs Road will be reaching capacity for an urban road, which in turn will affect turning movements at intersections and pedestrian/cyclist crossing opportunities. Refer to my discussion in Section 5.4
- The Edward Street / Ellesmere Road / Lincoln Tai Tapu Road intersection is indicated to operate acceptably once traffic from PPC69 is added. Council has programmed an upgrade of this intersection to a roundabout in 2024/2005, which will address existing sight line issues for the Ellesmere Road (south) approach. I consider that this upgrade should be in place prior to any development within PPC69, otherwise unmitigated safety effects may result due to additional vehicle movements through this intersection. Refer to my discussion in Section 5.5
- I recommend that the two proposed accesses from PPC69 to Springs Road are identified in the ODP as roundabouts/signals. Refer to my discussion in Section 5.6
- I recommend that a planning mechanism is provided, requiring the applicant to upgrade Ellesmere Road between Moir Lane and Edward Street to a Collector Road standard in conjunction with any road connection from PPC69 to Moir Lane. Further, I recommend that no development occurs

within PPC69 until Council's seal widening of Ellesmere Road, between Edward Street and Knights Stream Bridge is completed. Refer to my discussion in Section 5.7.1

- I consider that the application does not provide sufficient information to determine the feasibility of the upgrade of Moir Road to Collector Road standard, including providing for existing Rail Trail link and crossing point on Ellesmere Road. Until such information is provided, I am unable to support PPC69. Should the upgrade be determined to be feasible, I recommend that a planning mechanism is provided requiring the applicant to undertake the following works in conjunction with any development within PPC69. Refer to my discussion in Section 5.7.2
    - Construction of a road connection between any development within PPC69 and Moir Lane
    - Upgrade of the existing Moir Lane to Collector Road standard, including Rail Trail facilities
    - Upgrade of Ellesmere Road to Collector Road standard between, and including the intersections of, Moir Road and Edward Street
- I recommend that the ODP identify the requirement for a gateway treatment for Springs Road. Refer to my discussion in Section 5.8
- Should the upgrade of Moir Lane not be feasible, Collins Road may be an appropriate alternative access to PPC69. Should the Collins Road corridor be used to access Ellesmere Road, I recommend that a planning mechanism is provided requiring the applicant to undertake the following works in conjunction with any development within PPC69. Refer to my discussion in Section 5.8
    - Construction of a road connection between any development within PPC69 and Collins Road
    - Upgrade of Collins Road to Collector Road standard between, and including the intersections of, Spring Road and Ellesmere Road
    - Upgrade of Ellesmere Road to Collector Road standard between, and including the intersections of, Collins Road and Edward Street
- The potential future roading connections to Verdeco Park and Te Whāriki subdivisions, shown in the ODP, have been precluded by consented subdivisions. The potential future roading connection to Liffey Springs Road is feasible, however would require an alignment through a Council reserve and not proposed by PPC69. I consider that PPC69 will not be well connected to surrounding urban developments and will primarily rely on Springs Road and Ellesmere Road to connect with the existing Lincoln urban area. As a result, I consider that PPC69 will have poor connectivity to adjoining urban areas, and lower active and public transport usage. Refer to my discussion in Section 5.9
- I recommend that the ODP indicates frontage upgrades for Springs Road and Collins 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. Refer to my discussion in Section 6.1
- I recommend that the ODP should be amended to include additional walking and cycling routes within PPC69. Refer to my discussion in Section 6.2

- PPC69 is inconsistent with the Lincoln Structure Plan, in that it is outside the anticipated urban area. Should PPC69 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. However, assessing the effects of such development on the long term planning and funding commitments associated with bulk transport infrastructure is complex and requires assessment of multiple land use scenarios. Refer to my discussion in Section 7.

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

- I recommend that Council consider the proportional effect that PPC69 will have on network hotspots and assumed intersection improvements contained in the 2031 Lincoln Paramics model, as identified in Table 2. Council should consider whether the proportional effects of PPC69 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. Refer to my discussion in Section 4.

Overall, I consider the assessment of potential transport effects resulting from PPC69 have not been adequately considered, as such I cannot support PPC69 at this stage.