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Central Otago District Plan

Plan Change 18 Cromwell Industrial Zone Extension

Section 42A Hearings - Report on submissions and further submissions

19 June 2023

Report prepared by

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List of Abbreviations:

CODC	Central Otago District Council
RPS	Regional Policy Statement
CODP	Operative Central Otago District Plan
PC18	Proposed Plan Change 18
RMA	Resource Management Act 1991
NPS-HPL	National Policy Statement for Highly Productive Land
CSP	Cromwell Spatial Plan

List of Submitters addressed in this report:

Submitter Ref	Further Submitter	Submitter Name	Abbreviation
1	Y (x3)	Cerise Orchard Limited	
2	Y	Werner Murray	
3		SH6 At Cromwell	
4		Highlands Motorsport Park	
5		Aurora Energy Limited	
6		Transpower NZ Ltd	Transpower
7		45 South Management Ltd	
8		Department of Conservation	DoC
9		Waka Kotahi	

1. Purpose of Report

1. This report is prepared under s42A of the RMA in relation to Plan Change 18 (Implementation of the outcome of the CSP) to the CODP.

2. The specific aspect of the CSP implemented by PC 18 is the extension of the Cromwell Industrial Zone through re-zoning of land from Rural to Industrial.

3. The purpose of this report is to provide the commissioner with a summary and analysis of the submissions received on this plan change and to make recommendations in response to those submissions, to assist the commissioner in evaluating and deciding on the submissions.

4. The analysis and recommendations have been informed by transportation planning advice prepared by Chris Blackmore a Senior Transportation Planner from Abley, attached in Appendix 1.

5. The conclusions reached and recommendations made in this report are not binding on the commissioner. It should not be assumed that the commissioner will reach the same conclusions having considered all the information in the submissions and the evidence to be brought before them, by the submitters.

2. Qualifications and Experience

6. My name is Ann Fiona Rodgers. I am employed as Principal Policy Planner for Central Otago District Council, based in Alexandra. I hold a Master of Regional and Resource Management from the University of Otago. I am a member of the New Zealand Planning Institute.

7. I have over 25 years planning experience in central government, local government, and the private sector. My experience includes development of spatial plans, district plan review/changes preparation, and resource consent preparation, processing, and review.

8. This report evaluates the relief requested in submissions and provides recommendations in the form of a s42A report. I was involved with the preparation of proposed Plan Change 18.

9. Although this is a Council hearing, I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note and that I have complied with it when preparing this report. I have also read and am familiar with the Resource Management Law Association / New Zealand Planning Institute "Role of Expert Planning Witnesses" paper.

10. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person. Having reviewed the submitters and further submitters relevant to this topic I advise there are no conflicts of interest that would impede me from providing independent advice to the Commissioner.

3. Scope and Format of Report

11. This report is prepared in accordance with s42A of the Resource Management Act 1991 (RMA). It provides my assessment and recommendations to the commissioner on submissions made on proposed Plan Change 18 to the CODP.

12. The assessment of submissions generally follows the following format:

    a. An overview of submissions.

    b. An analysis of submissions by topic.

    c. Recommendations, including any amendments to proposed plan change (and associated assessment in terms of s32AA of the RMA where appropriate).

13. In some cases, where appropriate, the outline of submission points and their analysis is combined in one section.

14. Further submissions have been considered in the preparation of this report, but limited to the matters raised in original submissions and therefore the subject matter is canvassed in the analysis of the original submission.

15. Clause 16(2) of the First Schedule to the Resource Management Act 1991 (RMA) allows a local authority to make an amendment to a proposed plan without using a Schedule 1 process, where such an alteration is of minor effect, or may correct any minor errors. Any changes recommended under clause 16(2) are footnoted as such.

4. Plan Change Overview

16. PC18 was notified on 14 October 2021 with submissions closing 9 December 2021. A summary of submissions was notified 17 February 2022 closing 17 March 2022. Nine original submissions and four further submissions were received.

17. The proposed plan change has been notified to give effect to the outcome of the Cromwell Spatial Plan (CSP) by extending the industrial area in Cromwell, zoning an additional area of 52 hectares of Council owned land on Bannockburn Road from Rural Resource Area to Industrial Resource Area, identified in the CSP. The proposed re-zoning will also include an additional area fronting onto State Highway 6 between Cemetery Road and McNulty Road, connecting with the existing industrial land on McNulty Road.

18. The proposed Cromwell Industrial Extension as identified in the CSP consolidates industrial activity away from residential zones towards the Department of Conservation (DoC) managed Chafer Beetle Reserve and the Highlands Motorsport Park.

19. The area subject to the re-zoning is located between Bannockburn Road and Cemetery Road, north of the Department of Conservation administered Chafer Beetle Reserve and fronting onto State Highway 6 between the intersections of Cemetery Road and McNulty Road (see Figure 1 below).

20. PC 18 is primarily a re-zoning of land from rural to industrial, making only minor amendments to the provisions in the Plan through the addition of a new performance standard applicable to the Cromwell Industrial Extension to manage potential access and traffic effects, by not allowing direct access onto Bannockburn Road or SH 6 and providing road access only onto Bannockburn Road, designed at the time of subdivision to provide for light vehicle access only.

21. The proposed new performance standard is intended to assist with the management of heavy traffic movements generated by the proposed re-zoning through existing arterial routes.

22. The Plan Change seeks to provide for growth related demand for appropriately zoned land to accommodate industrial activities, on land identified in the CSP as being suitable for re-zoning to industrial.

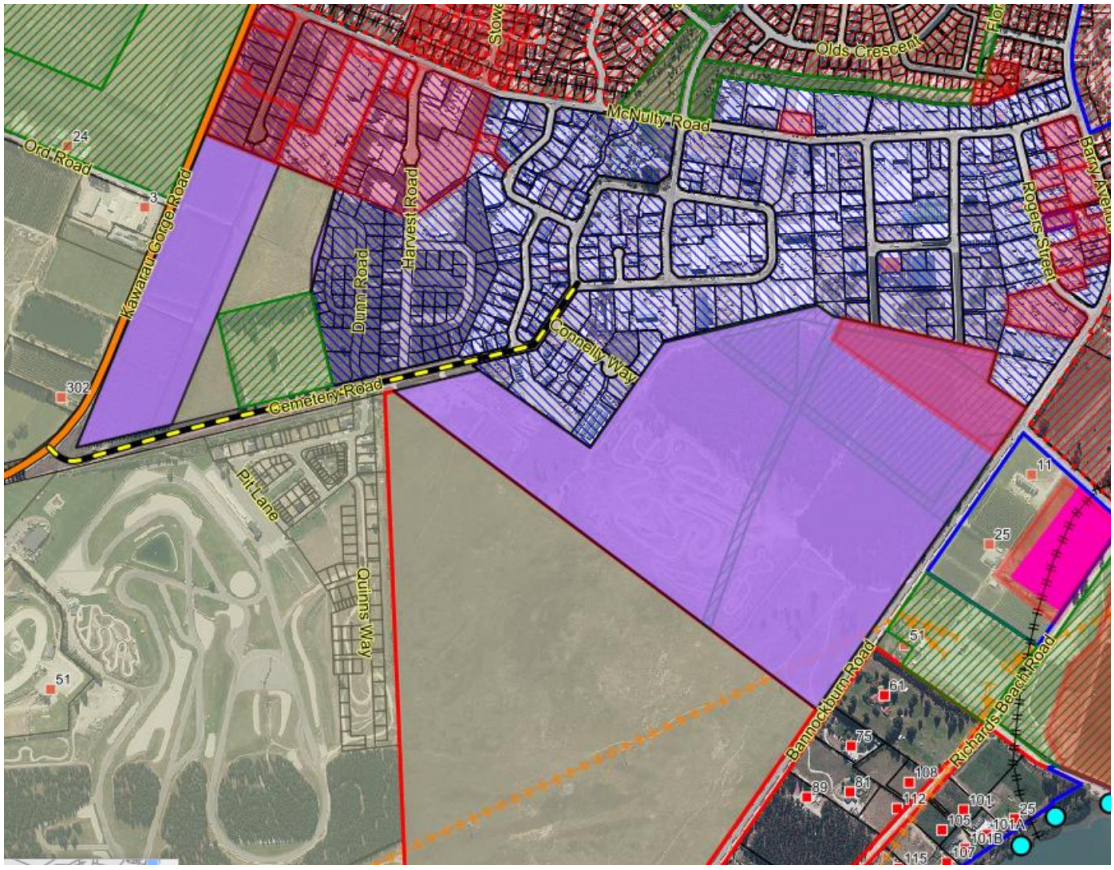

Figure 1 – District Plan GIS Map - PC 18 (Cromwell Industrial Extension) in purple

5. Procedural Matters

Waka Kotahi

23. There has been on-going discussion with Waka Kotahi, in relation to the matters raised in their submission.

24. Council engaged Abley to undertake transport modelling to understand potential impacts of the proposed re-zoning on the safety and efficiency of the roading network both prior to and post submissions closing. Several meetings have been held and a number of reports were prepared by Abley on behalf of the CODC in response to those discussions. At the time of writing this report no formal response has been received from Waka Kotahi or Beca on their behalf in relation to the findings of the modelling undertaken. A copy of all relevant emails and reports are attached in Appendix 2.

Department of Conservation

25. Council has discussed with DoC the matters raised in their submission seeking clarity around the remedy sought. In response to these discussions DoC providing some contextual information that is attached in Appendix 3. This information has been considered in the submission analysis in section 8 of this report.

Clause 16 (2) of the First Schedule to the RMA

26. During the review of submissions, it became apparent that the numbering of the proposed new performance standard for access has been incorrectly identified in the plan change documentation as Rule 7.3.6 (vi) (j) with a breach that references Rule 9.3.5. The proposed new standard should be numbered 9.3.6 (ix) as indicted below:

    ~~*"7.3.6 (vi) (j)*~~ *9.3.6 (ix)* ***Access – Cromwell Industrial Extension…"***

27. In the process of writing this report it has also become apparent that a corresponding non-complying activity provision is missing from Chapter 9, along with a number of consequential changes necessary to support the new rule that have not been included in the proposed changes.

28. It is necessary to insert a non-complying activity status provision at 9.3.5 and amend performance standard numbering from 9.3.5 to 9.3.6, to accommodate the new rule 9.3.63 (ix).

29. It is recommended that these minor corrections be made to chapter 9. [1]

National Policy Statement for Highly Productive Land

30. The site of the proposed plan change in not classified as LUC 1-3 and is not captures by the interim provisions of the NPS-HPL.

Supporting Submissions

31. Four submitters support PC 18 and zone changes proposed. One submitter supports areas proposed to be zoned rural to residential as they are located adjacent to existing development and largely align with Spatial Plans. The support of these submitters is acknowledged in the table below:

Submitter Ref	Submitter Name	Submission
1	Cerise Orchard Limited	Cerise Orchard Limited submissions supports PC18 in its entirety. The submitter considers that Cromwell is a key service centre in the Upper Clutha Basin and land zoned for industrial purposes is essential to support horticultural, viticultural, and other rural activities in Cromwell, in Alexandra, Wanaka and Queenstown.

[1] Change pursuant to Clause 16 (2) of the First Schedule to the Resource Management Act 1991

		The submitter also notes the strategic location in terms of access to infrastructure, extending and consolidating existing industrial land. It is noted that the area to be re-zoned as Industrial Zone under Plan Change 18 was identified as being suitable for the proposed extension of the existing Industrial Resource Area zone, part of the Cromwell Spatial Plan in 2018.
3	SH6 At Cromwell	Cromwell is the Hub of Central Otago and to maintain this more industrial land will be required as per PC18.
4	Highlands Motorsport Park	The rezoning will meet the current and future demand within Cromwell and more appropriate zone option to be in proximity to motorsport park than other options.
7	45 South Management Ltd	Increased industrial land in the future will allow better support of Horticultural activities on a local level. Agrees to loss of Cherry orchard as that variety is no longer popular and 'at end of life' as plenty other suitable land available for horticulture & viticulture. Re-zoning mitigates spray drift and reverse sensitivity issues.
10(F)	Cerise Orchard Limited (F1)	Supports Highlands Submission as a whole.

6. Statutory Framework

32. This section sets out documents that are relevant to the provisions and submissions within the scope of this report. Although a summary of the way in which these provisions are relevant is provided below, the way in which they influence the assessment of the relief requested by submissions will be set out in the actual assessment.

33. The assessment under the RMA for this Plan Change includes whether:

    a. it is in accordance with the Council's functions (s74(1)(a));

    b. it is in accordance with Part 2 of the RMA (s74(1)(b));

    c. it will give effect to any national policy statement or operative regional policy statement (s75(3)(a) and (c));

    d. the objectives of the proposal are the most appropriate way to achieve the purpose of the RMA (s32(1)(a));

    e. the provisions within the plan change are the most appropriate way to achieve the objectives of the District Plan (s32(1)(b)).

34. In addition, assessment of the plan change must also have regard to:

    1. any proposed regional policy statement, and management plans and strategies prepared under any other Acts (s74(2));

2. the extent to which the plan is consistent with the plans of adjacent territorial authorities (s74 (2)(c)); and

3. in terms of any proposed rules, the actual or potential effect on the environment of activities including, in particular, any adverse effect (s76(3)).

35. The assessment of the plan change must also take into account any relevant iwi management plan (s74(2A)).

36. Specific provisions within the RMA and in other planning documents that are relevant to PC18 are set out in the Section 32 Report. These documents are discussed in more detail within this report where relevant to the assessment of submission points.

37. The assessment of submission points has also been undertaken in the context of the Section 32 report prepared for PC18. All recommended amendments to provisions since the initial Section 32 evaluation was undertaken must be documented in a subsequent s32AA evaluation and this has been undertaken, where required, in this report.

7. Overview of Submissions

38. Nine original submissions and four further submissions were received on PC 18. Three original submissions were in support of the plan change and six were seeking relief.

39. Submitters seeking relief are outlined below:

Submitter Ref	Submitter Name	Submission and Analysis
2	Werner Murray	Submitter states that the National Planning Standards need to have 2-3 industrial zones (Light Industry, General Industry, and Heavy. Suggests a Structure Plan should be put in place.
11(F)	Cerise Orchard Limited (F2)	Submitter opposes Werner Murray's submission. Finding it to be ambiguous and unclear if he opposes PC18 as publicly notified or seeks modification as potential modification requests unknown. Submitter doesn't provide any suggested modification to the Industrial Chapter. The further submission from Cerise Orchard Limited considers that the proposed PC18 to be appropriate for industrial use and recognised as such in Cromwell Masterplan and Spatial Plan. They consider the industrial zone development will not detract from town centre. The provision of industrial land is necessary to accommodate present and future demand for industrial activities. Rezoning land will not adversely affect the entrance to Cromwell. Structure plan is unnecessary.

		Submitter considers a structure plan is unnecessary as roading can be adequately managed through performance standards.
5	Aurora Energy Limited	Aurora seeks performance standards or advice notes be attached to any further approvals. They are concerned about required comms ensuring any work undertaken does not undermine existing infrastructure or compromise compliance with NZ Electrical Code of Practice 34 (Safety Clearances), e.g., no mechanical excavation within 2m of strategic cables. concerns also include possible issues with reverse sensitivity or compromise of network functionality, landscaping should not occur under overhead lines or on top of underground cables and managing potentially required outages.
6	Transpower NZ Ltd	Neutral regarding the principle of rezoning the Plan Change 18 Cromwell Industrial Extension, on the proviso that there are no changes that could impact on the National Grid & no changes are made to existing District Plan provisions in Chapters 12 and 13 that regulate land use and development in proximity to then the existing transmission line through the site.
8	Department of Conservation	The Department of Conservation (DoC) has raised concerns in relation to potential adverse edge effects on the Cromwell Chafer Beetle Nature Reserve. The submission states "*the Cromwell Chafer Beetle Nature Reserve (CCBNR) is an extremely rare inland dune system which provides habitat to the Cromwell Chafer Beetle, which is the only remaining habitat for these beetles in the world and they are restricted to this site*." The CCBNR high is also habitat to other animal species endemic to Central Otago, Fauna unique to this reserve and negative effects on the micro-climate through changes in localised hydrology, shading and sheltering from adjacent properties and their potential light pollution. The submitter considers that the potential effects from industrial development on land to the north of the reserve include potential changes in the micro-climate through shading and sheltering the edge of the reserve from the harsh elements that contribute to the unique habitat requirements for the threatened fauna within the reserve. The submitter is requesting either 25m strip removed from zone adjacent to Beetle Reserve and made open space to prevent future development or a no building restriction put on the same strip of land.

13(F)	Werner Murray	Submission opposing the DoC submission. Does not agree with buffer zone suggested for land adjacent to Chafer Beetle reserve. Is of the view that the proposed buffer zone will not address the issue of pests and weeds. Considers that no shading diagrams have been provided and believes that recession planes will deal with shading issues. Considers that land is developed in line with NZS4404:2004 CODC amendment, the buffer will not address hydrology regime like NZS. Recommends putting measures in place to mitigate potential effects rather than adding a buffer zone.
9	Waka Kotahi	Waka Kotahi is supportive in principle of the intent to extend the Cromwell Industrial area but have raised concerns that the plan change will have an effect on the safe and efficient operation of the transport network, in particular in relation to potential impact on Intersections McNulty Rd & Cemetery Rd with SH6 and intersection of McNulty & Barry Ave.
12(F)	Cerise Orchard Limited (F3)	Opposes Waka Kotahi Submission. Rapid Growth of Cromwell already increasing use of adjoining state highways. Submission provides no evidential foundation to support claims of adverse effects from proposed rezoning. Performance standard 9.3.6(VI)(J) is appropriate and sufficient to protect state highway network. Some additional traffic generation may occur over time from rezoning however perceived problems are not insoluble. Traffic volumes from growing Cromwell need addressing regardless of PC18. Transport management to deal with increasing traffic volumes can be dealt with outside plan change process. The plan change is necessary to ensure industrial land is available to meet present and future needs.

8. Submission Analysis

40. Nine original submissions were received on PC18 and 4 further submissions.

41. This report is structured on a topic basis, addressing matters raised in submissions, as follows:

    - Zone Provisions
    - Transportation and Access
    - Chafer Beetle Reserve
    - Electricity Service/Transmission Lines

Zone Provisions

42. The submission from Werner Murray[2] appears to indicate a view that the National Planning Standards requires the creation of light medium and heavy industrial zoning. While the National Planning Standards does provide for these three zonings there is no requirement to include the three zones. I note the standard also provides for a General Industrial Zone.

43. The Zone Framework Standard of the National Planning Standards[3] on page 37 describes the General Industrial Zone as "*Areas used predominantly for a range of industrial activities. The zone may also be used for activities that are compatible with the adverse effects generated from industrial activities."*

44. The General Industrial Zone descriptor in the National Planning Standards reflects the nature, scale, and pattern of development in the Cromwell Industrial Zone.

45. There is no evidence to suggest that the current pattern of development is no longer working or appropriate for Cromwell.

46. The proposed plan change is predominantly re-zoning with only minor amendments to performance standards, restricting direct access onto Bannockburn Road and State Highway 6, and restricting heavy vehicle movements onto Bannockburn Road.

47. The purpose of the plan change is to give effect to the outcome of the Cromwell Spatial Plan.

48. The area was recognised as suitable for an extension of the existing Industrial Zoning as part of the Cromwell Spatial Plan development. The provision of industrial land that consolidates the activity away from the town centre was necessary to accommodate present and future demand for industrial activities.

49. The submitter doesn't provide any proposed amendments to chapter 9 to consider in this evaluation.

[2] Werner Murray Submission (Submitter #2)
[3] national-planning-standards-november-2019-updated-2022.pdf (environment.govt.nz)

50. Given the lack of clarity around what is being sought and in the absence of any proposed zoning changes to consider I am unable to recommend any changes in relation to the zone provisions requested by the submitter.

Transportation

51. Waka Kotahi [4] have indicated in their submission that they would like to see further evidence confirming that the plan change will enable the safe and efficient operation of the transport network and provide for strategic and co-ordinated development.

52. CODC commissioned Abley to provide transportation planning advice in relation to PC18.

53. A microsimulation model of the Town of Cromwell was developed mid-2020 by Abley with the intention to support the implementation of the Cromwell Masterplan Spatial Framework, has been used to understand and quantify impacts of growth and development on the roading network in Cromwell.

54. Prior to the notification of Plan Change 18 the Central Otago District Council engaged Abley to undertake an assessment of the transport network in and around Cromwell. The initial modelling undertaken indicated that in the long term there was potential pressures on arterial road. A copy of that assessment dated 8 July 2021 is included in Appendix 2.

55. The initial report dated 8 July 2021 indicated likely effects on the Cromwell roading network due when considering in the context of a 30-year growth projection for Cromwell.

56. The initial report considered that upgrades were likely to be required at the SH6 intersections at McNulty Road and Cemetery Road. The report indicated further assessment and engagement with Waka Kotahi will be required to confirm the most suitable form for these intersections.

57. Council staff, engaged with Waka Kotahi, on 4th August 2021, to understand what existing pressures were on the intersections of McNulty Road/State Highway 6, Cemetery Road/State Highway 6, and the wider State Highway network.

58. Waka Kotahi were unable to provide any information, and indicated there was no work programmed to upgrade the intersections with the State Highway corridor. It was apparent that further work would be required to establish what, if any, effects the proposed re-zoning would have on the intersections beyond that that can be attributed to population growth in general.

59. The plan change was notified acknowledging that further engagement would be required with a Waka Kotahi.

60. Following notification of the plan change, CODC continued to engage with Waka Kotahi and their consultants Becca.

61. In response to on-going discussions as response was received from Becca on behalf of Waka Kotahi on 27 May 2022 requesting additional information.

62. On 26 October 2022 a further report was provided to Waka Kotahi and Becca. Feedback was received and a second draft was issued 1 November 2022, both are attached in Appendix 2.

63. A meeting on 23 February 2023 at which Waka Kotahi indicated they would like more work done. Minutes of that meeting and the information being requested is attached in Appendix 2.

64. At the meeting and in an effort to progress discussions, it was agreed that Abley on behalf CODC produced a further report that addressed the wider State Highway corridor in an around Cromwell.

[4] Waka Kotahi Submission (Submitter #9)

65. That information was provided to Waka Kotahi via email, following further modelling, on 18 May 2023 via email and is attached as part of Appendix 2.

66. The information developed through modelling by Mr Chris Blackmore, Senior Transportation Planner for Abley has been produced as expert traffic evidence on behalf the Central Otago District Council in support of this report and attached as Appendix 1. The evidence and attached technical report indicates that while the proposed re-zoning will result in an increase in traffic generated, growth related upgrades are required for the SH6 intersection at McNulty Rd irrespective of PC18 re-zoning.

67. Based on the transport modelling assessment, the intersections of SH6 / McNulty, SH6 / Cemetery Road and McNulty/Gair Ave area expected to require upgrades in the next ten years to respond to existing planned and zoned growth in Cromwell.

68. Mr Blackmores report concludes that while PC18 adds traffic to these three intersections, this traffic can comfortably be accommodated on the transport network following the implementation of suitable upgrades in response to Business-As-Usual growth.

69. He further considers that it would be appropriate for an Integrated Transportation Assessment report be prepared at resource consent stage in line with Waka Kotahi guidance to fully assess the effects of any future traffic generated on the PC18 site at the time of subdivision.

70. Further submitter Cerise Orchard Limited opposes the Waka Kotahi submission contending that growth in Cromwell has resulted in an increased use of the State Highway network. The submitter notes that Waka Kotahi asserts adverse effects from the proposed rezoning but does not provide any evidential support for the assertion.

71. It would be helpful to understand Waka Kotahi's intention in terms of corridor management and upgrades necessary to respond to growth demand ensuring the safety and efficiency of the State Highway network.

72. Cerise Orchard Limited are of the view that while there may be some additional traffic generated over time from re-zoning there are associated with growth in and around Cromwell need to be addressed irrespective of PC 19. They further contend that any potential effects can be managed through the existing performance standards in the operative District Plan.

73. I consider that the modelling and analysis produced by Abley demonstrates that upgrades will be required to the intersections of State Highway 6 with both McNulty Road and Cemetery Road, to address growth pressures regardless of rezoning through PC 18.

74. I agree with Mr Blackmore and Cerise Orchard Limited that an assessment at the time of subdivision against standards and assessment matters would be appropriate.

Chafer Beetle Reserve

75. The Department of Conservation[5] in their submission has raised concerns that the proposed re-zoning will have an adverse effect on Cromwell Chafer Beetle Nature Reserve which is also habitat to other animal species endemic to Central Otago, potential negative effects on the micro-climate through changes in localised hydrology, shading and sheltering from adjacent properties and the potential for light pollution.

76. Additional information was sought from the DoC to assist in understanding the reserve and the concerns raised in the submission. That information is attached to this report on Appendix 3.

[5] Department of Conservation (Submitter #8)

77. The information provided by DoC states that the Cromwell Chafer Beetle Nature Reserve is an extremely rare inland dune system which provides habitat to the Cromwell chafer beetle. The Chafer Beetle is classified as threatened (nationally critical). The Cromwell site is the only remaining habitat for these beetles in the world.

78. The reserve was gazetted in the 1983 and was then the only reserve in the world created to protect an invertebrate species. The Cromwell chafer beetle has the same threat classification as kakapo and fairy tern which relates to their limited available habitat and other pressures and risks to the species.

79. DoC considers that the zone change allows for environmental standards set at a lower level than in the rural resource area with the ability to subdivide to smaller lot sizes, increased site coverage/development due to the nature of industrial activities, reduced boundary setbacks and an increased building height and density of development located closer to the boundary.

80. DoC considers that an increase in artificial lighting could affect the normal pattern of activity of the beetles. Increased light spill due to cumulative effects along the boundary. The beetles are typically active late at night.

81. While it is acknowledged that there will be an increase in the amount of artificial light generated as a result of a change to industrial zoning, the lightspill provisions in the District Plan apply across all zones and will not change as a result of the proposed zone change.

82. The lightspill provisions contained in chapter 12 (District Wide Rules), rule 12.7.6 (i) states:

"*No activities shall result in greater than 10 lux spill (horizontal and vertical) of light onto any adjoining property or road, measured at the boundary of a road or the notional boundary of a neighbouring property, provided that this rule shall not apply to headlights of moving vehicles or vehicles that are stationary for less than 5 minutes or to street lighting.*

The amount of light that may be spilled onto a neighbouring property may be increased by not more than 100%, in cases where the activity on that neighbouring property is not residential.

83. Given the reserve is not residential a lux level of 20 is permitted. As indicated above rule 12.7.6 is a district wide rule and currently applies to the site.

84. I am of the view that that given the sensitivities of the Chafer Beetle and its nocturnal habits it would be appropriate to make a consequential change to rule 12.7.6 (i) noting an exception in relation to sites in the Cromwell Industrial Extension that limits the lux spill level to 10.

85. A recommended amendment to Rule 12.7.6 (i) is noted in Appendix 4.

86. In terms of Section 32AA, the scale of change is relatively minor. In my view the exception to the second part of rule 12.7.6 (i) recognises that while a level lightspill that is acceptable to neighbouring non-residential activities, the neighbouring Chafer Beetle reserve is an appropriate exception. In my view, a limited exception, as well as the additional consideration in the matters of discretion will not undermine overall application of the rule. I consider the exemption to be an efficient approach given it is limited to a specific property.

87. The submitter considers potential changes to climate and soil properties due to development at the boundary could cause weed growth to increase in the edge areas and cause competition with host plants for the beetles and generally make the affected area unsuitable as a habitat.

88. The submitter is requesting either a 25m strip removed from zone adjacent to Beetle Reserve and made open space to prevent future development or a no building restriction put onto the same strip of land.

89. It is not clear how a buffer or no build area of 25m, as sought by the submitter, would be managed to control of weeds, pests or lightspill nor is there any evidence to support the why a 25m setback of building is necessary to mitigate edge effects.

90. The submitter doesn't provide any detail explaining why a 25m buffer is sought, nor what the expectation would be in terms of maintenance of the buffer. It would seem that if the buffer was to be maintained through spraying of weed species that in itself may have a detrimental effect on the Chafer Beetle habitat.

91. I am not persuaded as to the effectiveness of the requested 25m setback in terms of mitigating the edge effect concerns raised by the submitter and anticipate evidence in support of their submission will provide more clarity as to why the 25m is considered to be the appropriate setback.

92. The submitter raises concerns about the difference between what can occur under the rural zoning versus the industrial zoning.

93. While it is acknowledged that the industrial zoning is more likely to result in a higher density of development, the rural zone provides for and unlimited number of non-residential buildings to be constructed 10m from the boundary and up to 10m high as a permitted activity. A 2m high solid fence can also be constructed on the boundary.

94. I have considered other possible ways the potential edge effect concerns raised by the submitter could be addressed.

95. One option would be to include a strip on the boundary as part of an indicative roading structure. An indicative roading structure plan has been prepared by Ableyand would require the main roading network for the proposed re-zoning to link between Bannockburn Road and Cemetery Road along the boundary of the Chafer Beetle Reserve and to two other points in the existing industrial zoning as indicated in Figure 3 below.

96. This would provide for a 20m wide legal road reserve along the boundary with the Chafer Beetle Reserve, reducing potential shading effects and management of weeds through sealing of the road.

97. The proposal has been discussed briefly with DoC and the CODC property team. The property team has indicated they are not opposed to the concept for the future development of the site. It is anticipated that DoC will provide comment on this option through evidence submitted in support of their submission.

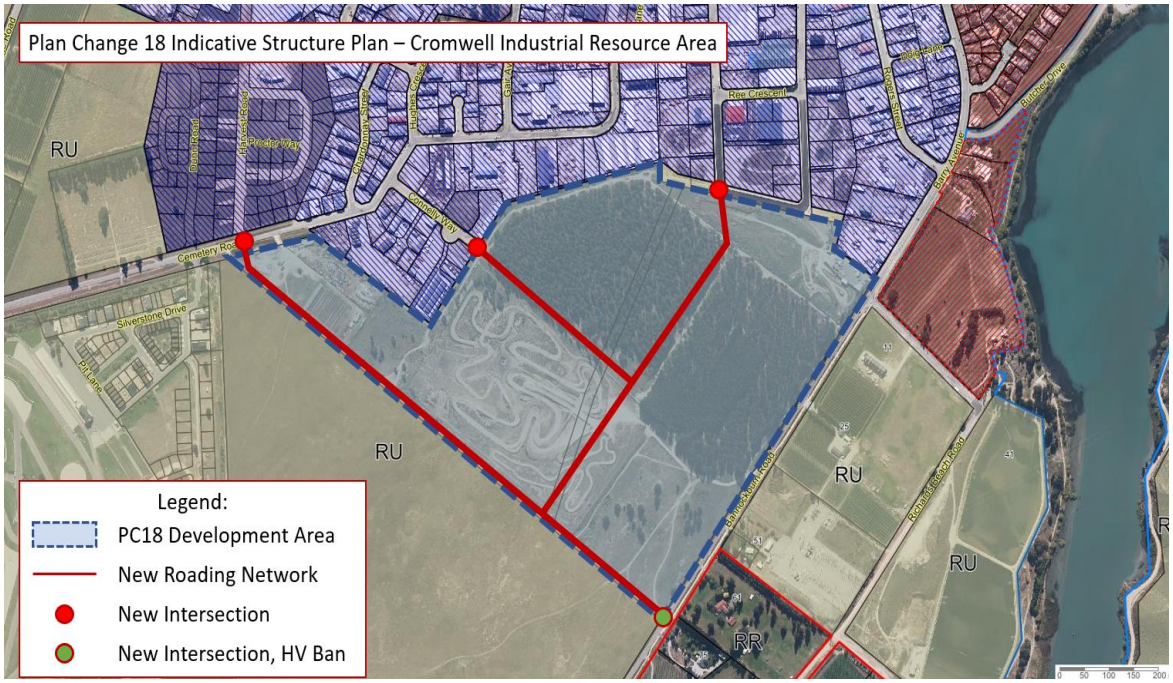

Figure 2: Indicative Roading Structure Plan

98. Another option would be to require a landscaped bund be installed along the boundary with the reserve. The setback and height of the bund could be limited and the

99. I will defer making a recommendation regarding the mitigation requested by DoC in anticipation of the submission of a statement of evidence from the submitter in response to the matters raised in this report.

100. A Section 32AA evaluation will be made if appropriate following the hearing of evidence in relation to the setback.

Electricity Supply/Transmission

101. The Transpower[6] submission is neutral regarding the principle of rezoning proposed in PC18, provided that there are no changes that could impact on the National Grid, and no changes are made to operative CODP provisions in chapters 12 and 13 regulating land use and development in proximity to the existing transmission line through the site.

102. For completeness I note that transmission lines bisect the southern corner or Lot 3 DP 526140 coming across the adjacent Chafer Beetle Reserve as indicated in Figure 3.

[6] Transpower (Submitter 6)

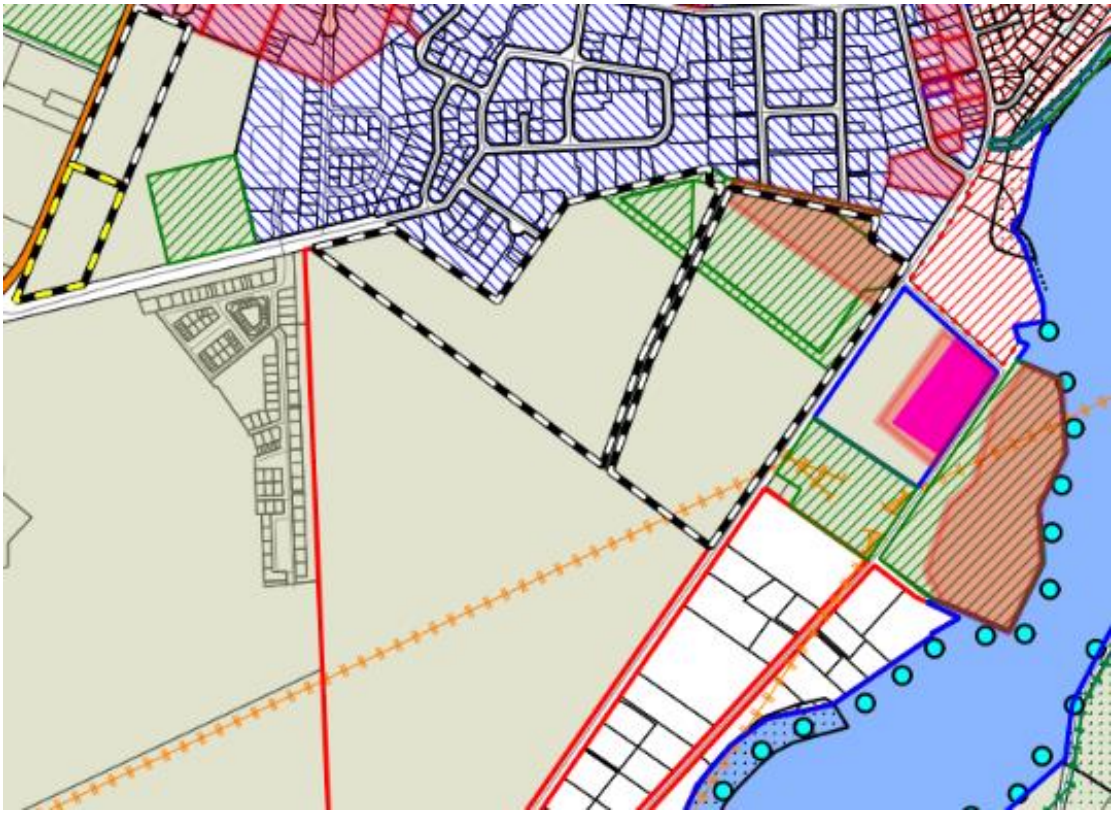

Figure 3: Transmission Lines

103. Rule 12.7.8 outlines performance standards that apply across all zones in relation to the location of buildings in proximity to Transmission Lines. PC 18 doesn't propose any changes to chapter 12.

104. Chapter 13 provides a stand-alone-code for infrastructure across all zones. This includes provisions for maintenance and upgrading of Transmission Lines. PC 18 does not propose any changes to chapter 13.

105. Aurora Energy Limited[7] owns three separate lines and supporting infrastructure running through the area of land proposed for rezoning, legally described as Lot 5 DP 454268, Lot 3-4 DP 526140, and Section 2 SO Plan 526035.

106. The submitter has indicated that these lines are strategic assets for Aurora Energy serving a number of commercial, residential, and industrial customers in Cromwell and the wider Central Otago/Queenstown Lakes region.

107. Aurora also indicate that they have infrastructure bordering Lot 1 & 2 DP 390710 adjacent to State Highway 6.

108. The submission is neutral regarding the re-zoning but seeks assurances that the future development of that zoning will not have any adverse effect on their assets on or adjacent to the site of the proposed plan change.

109. The submitter is seeking performance standards or advice notes (presumably in relation to future subdivision), that guarantees the protection of the network.

[7] Aurora Energy Limited (Submitter 5)

110. PC 18 does not propose any changes to the District Wide provisions of chapters 12 and 13 of the District Plan.

111. Chapter 12 (District Wide Rules) outlines objectives, policies and rules that apply to all land use activities across all zones and specifically provides for electricity transmission networks through the following provisions:

    a. Objective 12.3.7 – "*To ensure that activities avoid reverse sensitivity effects, avoid compromising the operation, maintenance, upgrading and development of the transmission network and avoid risk to people";*

    b. Policy 12.4.10 – "The transmission network is of national significance and nearby activities are therefore to be managed to avoid adverse effects in terms of reverse sensitivity, in terms of compromising the operation, maintenance, upgrading and development of the transmission network and in terms of ensuring that activities that are particularly sensitive to the risks associated with transmission lines are not located in close proximity to those lines"; and

    c. Rule 12.7.8 – provides an extensive suite of requirements in terms of building or work undertaken in proximity to transmission lines, in relation to location and height of buildings, earthworks and subdivision. Rule 12.7.8 also requires compliance with NZECP 34:2001.

112. As indicated above chapter 13 provides a stand-alone code for utility providers and no change is proposed to those provisions as a result of PC 18.

113. Chapter 16 (Subdivision) outlines requirements for all subdivisions and specifically provides for infrastructure services through the following provisions:

    a. Objective 16.3.2 - *"To ensure that subdivisions provide all necessary services and infrastructure without adversely affecting the public interest and the ongoing viability of those services and infrastructure";*

    b. Policy 16.4.3 – *"To require that the land to be subdivided is supplied with services and infrastructure that are adequate for the intended use of the land to be subdivided without the public interest being adversely affected"; and*

    c. General Standards in 16.7 that include compliance with Councils Subdivision Code of Practice and requirements for subdivision activities that occur in close proximity to high voltage transmission lines.

114. The submitter hasn't suggested any specific performance standards they would like to see included for consideration; however, I am of the view that the existing lines and infrastructure will be adequately protected and provided for within the existing framework of the District Plan, in chapters 12, 13 and 16 of the CODP.

9. Recommendations

115. Where changes have been recommended to provisions in response to submissions, those changes have been identified in Appendix 4.

Submitter Ref	Submitter	Recommendation
1	Cerise Orchard Limited	Accept
2	Werner Murray	No changes are recommended in relation to the submission received.
3	SH6 At Cromwell	Accept
4	Highlands Motorsport Park	Accept
5	Aurora Energy Limited	No change is recommended in relation to the submission as no change is proposed to chapters 12 or 13 in relation to development in and around transmission lines. Development of land and construction of buildings in proximity to transmission lines is provided for through chapter 12 of the CODP and maintenance and upgrading of network utilities is provided for in chapter 13 as a stand-alone code.
6	Transpower NZ Ltd	No change is recommended in relation to the submission as no change is proposed to chapters 12 or 13 in relation to development in and around transmission lines. Development of land and construction of buildings in proximity to transmission lines is provided for through chapter 12 of the CODP and maintenance and upgrading of network utilities is provided for in chapter 13 as a stand-alone code.
7	45 South Management Ltd	Accept
8	Department of Conservation	No change is recommended in relation to the submission received at this stage other than in relation to a minor amendment to the lightspill provision in chapter 12. It is anticipated that the submitter will provide evidence to support the requested 25m setback for buildings and comment on the other two options for managing potential edge effects noted in this report.
9	Waka Kotahi	No changes are recommended in relation the submission received. The reports and evidence prepared by Abley on behalf of the CODC indicate that the proposed re-zoning will not have an adverse effect on the safety and efficiency of the State Highway

		network beyond that associated with Business-As-Usual growth to 2034. The modelling prepared by Abley indicates that the intersections of McNulty Road and Cemetery Road with State Highway 6 will require upgrading within this timeframe despite any increase associated with the proposed re-zoning.

Appendix 1 - Abley Evidence

BEFORE THE HEARINGS COMMISSIONERS
APPOINTED BY THE CENTRAL OTAGO DISTRICT COUNCIL

under: the Resource Management Act 1991

in the matter of: Proposed Plan Change 18 to the Operative District Plan

and: **Central Otago District Council**
Applicant

Evidence of Chris Blackmore (transport modelling)

Dated: 8 June 2023

EVIDENCE OF CHRIS BLACKMORE

INTRODUCTION

1 My full name is Christopher John Blackmore.

2 I hold a Bachelor of Science and a Bachelor of Commerce (with Honours) in Operations Research from the University of Canterbury. I am a Young Professional Member of the Chartered Institute of Logistics and Transport, an affiliate member of Engineering New Zealand, and a member of the NZ Modelling User Group sub-group of ENZ.

3 I hold the position of Senior Transportation Planner at Abley. I have been in this position since 2020 and have been at Abley for six years. My experience during this time includes undertaking transportation modelling and analysis within a wide range of development and transportation planning projects, for both public and private sector clients.

4 I have undertaken modelling of the future transport environment using the Cromwell Paramics microsimulation model. The model was created in 2020 for Council by myself and the Abley team and has subsequently been used to support transportation planning across the township.

5 I am familiar with plan change 18 (*PC18*). I have engaged with Waka Kotahi on several occasions with respect to my traffic modelling of PC18.

CODE OF CONDUCT

6 Although this is not an Environment Court hearing, I note that in preparing my evidence I have reviewed the Code of Conduct for Expert Witnesses contained in Part 7 of the Environment Court Practice Note 2014. I have complied with it in preparing my evidence. I confirm that the issues addressed in this statement of evidence are within my area of expertise, except where relying on the opinion or evidence of other witnesses. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

SCOPE OF EVIDENCE

7 My evidence covers the following:

7.1 Analysis undertaken of the traffic impacts of PC18 based on the likely uptake of the Plan Change site in the next ten years; and

7.2 A sensitivity test of PC18 as requested by Waka Kotahi, assuming the full development of the PC18 area in the next ten years.

SUMMARY OF MODELLING ASSESSMENT

8 My transportation modelling assessment is attached as **Annexure A** to this evidence.

9 My modelling of the future transportation network has been undertaken with a future year of 2034. This future year was selected as it provided the most suitable alignment between the Waka Kotahi ITA guidelines[1], which recommend a ten-year planning horizon for the assessment of Plan Changes, and the Council-supplied demographic forecasts which included an interim future year of 2034.

10 I have received growth forecasts from Central Otago District Council (Council) which were prepared by Rationale consultants and subsequently endorsed by Council. Residential activity within the Cromwell Ward is forecast to increase from 4,074 total dwellings to 6,743 dwellings between 2018 and 2034. The majority of household growth to 2034 is forecast by to occur within Cromwell township. The distribution of household growth has been adopted from the forecasts at a Township level, and according to estimates of currently zoned residential capacity as provided by Council.

11 I have updated the transport network within the PC18 area in line with the structure plan included within the Council's s42a report.

12 Increases in industrial activity have been calculated based on current trip making behaviour and land utilisation within the existing industrial area located around McNulty Road. It should be noted that employment growth forecasts prepared by Rationale have included the PC18 land as available for development, meaning that the 'with PC18' scenario has been adopted from the Rationale employment forecasts and corresponded with a 50% uptake of the PC18 land, and the baseline 'without PC18' was developed as a counterfactual scenario which included more employment in the existing industrial areas, the town centre and elsewhere in the wider District by commuting outside of Cromwell for employment.

13 My assessment indicates the key network locations where effects are forecast to occur due to both business-as-usual growth in currently consented and expected activities, as well as the proposed industrial plan changes. From the results of the appended assessment, I have the following recommendations:

[1] https://www.nzta.govt.nz/assets/resources/research/reports/422/docs/422.pdf

13.1 It is my opinion that upgrades are required for the SH6 intersection at McNulty Rd irrespective of PC18, however it is noted that the inclusion of PC18 development activity does increase demands on SH6 / McNulty Rd.

13.2 My analysis indicates that Cemetery Road is not expected to require upgrades to increase capacity, however movement restrictions or additional safety treatments could be considered in conjunction with the provision of greater capacity and level of service at the McNulty intersection. The modelling has assumed that this will be upgraded to include a 60 kph Safe Intersection Speed Zone treatment to futureproof the performance of the State Highway 6 corridor.

13.3 An upgrade of the McNulty Rd / Gair Ave intersection is recommended regardless of PC18 being implemented and a roundabout is likely to be the most suitable form. It is my opinion that this upgrade is less urgent with PC18 implementation, as the additional link road is expected to remove some traffic from McNulty Rd.

14 Based on my assessment, I conclude that the intersections of SH6 / McNulty Road, SH6 / Cemetery Road and McNulty Road / Gair Ave require upgrades in the next ten years to respond to existing planned and zoned growth in Cromwell. The PC18 proposal adds traffic to these three intersections, and this traffic can comfortably be accommodated on the transport network following the implementation of suitable upgrades in response to business-as-usual growth.

SUMMARY OF REQUESTED SENSITIVITY TESTING

15 Following a review of the modelling assessment by Waka Kotahi representatives, a sensitivity test was requested with full uptake of the PC18 development by 2034. This contrasts with the previous scenario whereby only 50% of PC18 is anticipated to be developed in the next ten years. The purpose of this test is to robustly assess the traffic impacts of the full Plan Change site.

16 With the full development of PC18 there is less growth assumed in the existing industrial area and fewer commuting trips seeking employment outside the model area.

17 Compared to the prior scenario, the main increases in vehicle volumes occur on the main links between the Plan Change 18 area and SH6, and the Plan Change 18 area and Cromwell Town Centre. The additional volume in the evening peak hour is between 60 vehicles (SH6 northbound) and 100 vehicles (Barry Ave northbound). Most additional vehicles utilising Barry Ave are routing through to Alexandra, not the town centre area.

18 No significant increases in intersection delay were noted, with the intersections experiencing additional volumes, especially SH6/ McNulty Road and SH8 / SH8B, operating within capacity.

19 In my opinion the intersection layouts tested at SH6 / McNulty Road and McNulty Road / Gair Ave demonstrates sufficient reserve capacity to be operated in a way which maintains low delays along the State Highway while providing a higher level of capacity compared to the current intersection configurations.

CONCLUSION

20 I have undertaken modelling of cumulative transport effects of Plan Change 18 traffic using the Cromwell Paramics microsimulation model. This modelling assessment is appended to this report as **Annexure 1**.

21 I consider that the modelling has been undertaken in line with best practice and appropriately demonstrates the cumulative effects of PC18, along with currently planned and zoned growth on the Cromwell transport network.

22 I have concluded that upgrades are required for the SH6 / McNulty Road intersection irrespective of the development of PC18, however it is noted that the inclusion of the plan change landuse does increase demands on SH6 / McNulty Road.

23 It is further recommended that, should the rezoning be approved, an Integrated Transportation Assessment report be prepared at resource consent stage in line with Waka Kotahi guidance to fully assess the effects of any future traffic generated on the PC18 site. In my opinion this is a suitable mechanism to address the staging and timing of development with respect to future infrastructure upgrades to the transport network.

Dated: 8 June 2023

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CHRIS BLACKMORE

Industrial Plan Change Transport Modelling Technical Note

Prepared for	Central Otago District Council
Job Number	CODC-J007
Revision	3
Issue Date	1 June 2023
Prepared by	Chris Blackmore, Senior Transportation Planner
Reviewed by	Dave Smith, Technical Director

1. Overview

1.1 Background

Central Otago District Council (CODC) commissioned Ableley Limited (Ableley) to provide transport planning advice regarding proposed industrial plan changes on the outskirts of the existing McNulty industrial area to inform the industrial chapter in the District Plan review process. The Industrial Plan Change areas assessed are shown in Figure 1.1.

In mid-2020 Ableley developed a microsimulation model of the Town of Cromwell using Paramics Discovery software, with the intention to support the implementation of the Cromwell Masterplan Spatial Framework (the Masterplan). The base model representing 2018 was developed, calibrated, and validated but the future year models were not established at that time.

The model has been run to quantify any impacts on the wider transport network which result from the proposed industrial rezoning. To understand the extent of this potential development, a with industrial Plan Change scenario has been developed and compared to an Excluding Plan Change scenario using growth forecasts reflecting Central Otago District's most current growth projections. CODC have commissioned annual growth projection updates to be prepared by Rationale. CODC has supplied the latest 2022 projection update, published by Rationale in April 2022, to be utilised in this model. Ableley updated the future Cromwell model by developing a 2034 model to align with the growth projections.

This technical note documents the assumptions used in setting up the 2034 future year Industrial Plan Change and Excluding Plan Change scenarios and provides a brief summary of the transport network performance. Concept level testing was also undertaken to quantify the potential impact of intersection upgrades on McNulty Road, especially the intersection of McNulty Road and SH6.

An earlier draft of this report was shared with CODC and Waka Kotahi NZ Transport Agency for comment. At the request of Waka Kotahi, additional sensitivity testing was also undertaken to analyse the potential impact of full development of the Plan Change 18 area in the 2034 future year.

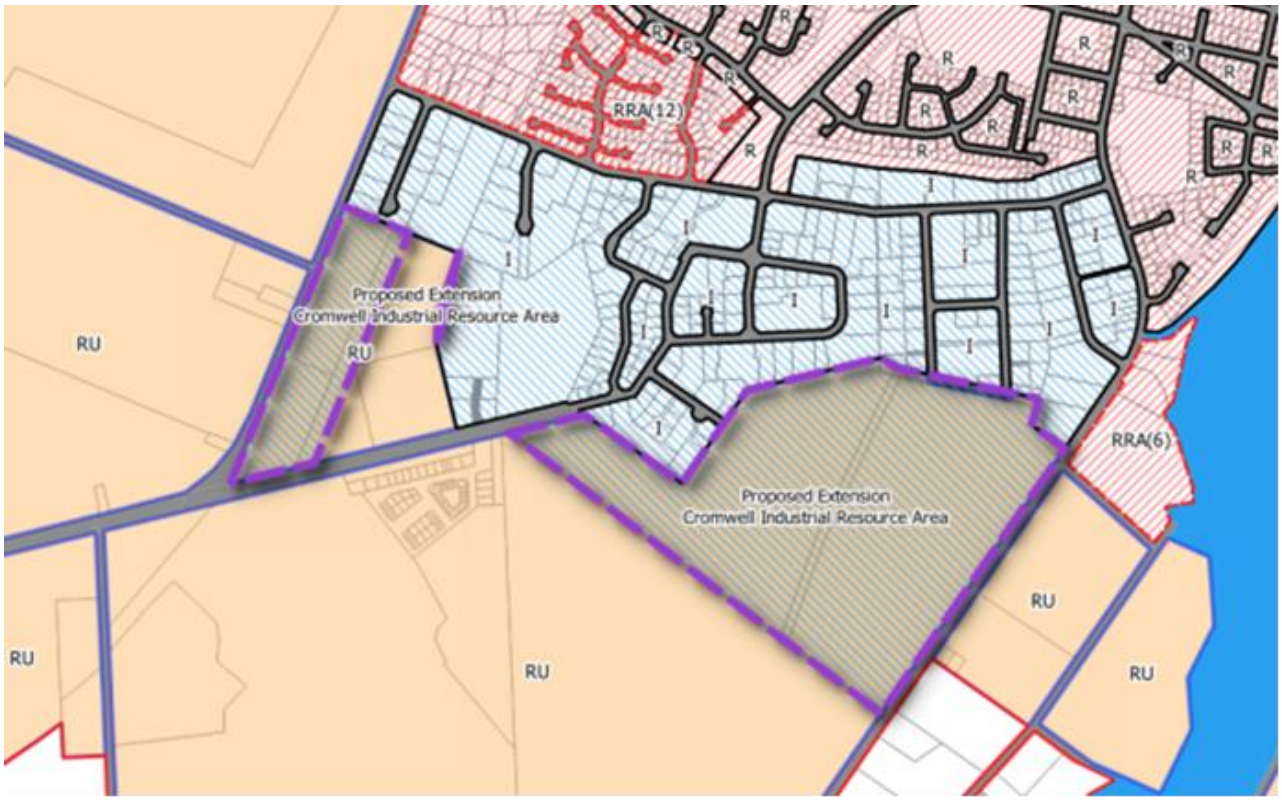

Figure 1.1 Proposed industrial Plan Change areas

2. Future Model Landuse Development

2.1 Growth Targets

The agreed landuse inputs for the future model development are the latest demographic forecasts reflecting Central Otago District's 2022 growth projections. These forecasts were developed by Rationale and were supplied by CODC. The agreed future year is a medium-term model representing the year 2034. The relevant demographic growth statistics are presented in Table 2.1.

The Lindis- Nevis Valleys growth area is only partially contained in the model area as is comprised of the mainly agricultural areas excluding the townships of Cromwell, Bannockburn, and Pisa Moorings. The 2018 model occupied household value has been used to apportion the growth that occurs within the model, of the occupied households in the Lindis- Nevis Valleys 53% are found in the modelled area so 53% of the area growth has been used.

Additionally, Abley were provided with the Cromwell Masterplan report (prepared by Rationale in 2018) which has some detail around future growth in the area. Some guidance from this document is used, acknowledging that it has not been updated for the latest 2022 growth forecasts.

Table 2.1 Demographic Forecast Summary from 2018 to 2034, total Cromwell Ward

Area	unit/year	2018	2034	Growth	2018 per HH	2034 per HH
Cromwell Township	Usually Resident Population	5,780	8,977	2,990	2.13	2.14
	Total Ratings Units	3,004	4,668	1,664		

	Total Dwellings	2,736	4,202	1,466		
Bannockburn Township	Usually Resident Population	500	986	486	1.98	2.20
	Total Ratings Units	276	511	235		
	Total Dwellings	252	449	197		
Pisa Moorings Township	Usually Resident Population	590	1481	891	1.91	2.25
	Total Ratings Units	345	776	431		
	Total Dwellings	309	657	348		
Lindis-Nevis Valleys (only 53% within model)	Usually Resident Population	1,390	2,758	1,368	1.79	1.92
	Total Ratings Units	885	1,623	738		
	Total Dwellings	777	1,435	658		
Cromwell Ward Total	Usually Resident Population	8,310	14,202	5,892	2.04	2.11
	Total Ratings Units	4,510	7,578	3,068		
	Total Dwellings	4,074	6,743	2,669		

2.2 Residential Growth Apportionment

The total dwelling growth was used in the residential growth apportionment and then area specific occupied dwelling rates were applied informed by the growth targets. In the 2018 Census the urban Cromwell area has an occupied dwelling proportion of 88.2%, whereas the Lindis-Nevis Valleys has a proportion of 85.7% and these occupancy rates have been carried forward to the 2034 future year.

Residential growth is initially apportioned to the known greenfield sites with total demand taken from the 2022 growth projections. Given the scale of residential growth the projected household demands exceeds the currently zoned residential area available. To apportion the remaining residential demand potential future residential greenfield and medium-density residential areas were identified by CODC. Lot size guidelines from the District Plan have been used to determine the scale of development in these areas, with a minimum lot size of 200m2 assumed for medium-density development. It was assumed that currently zoned greenfield areas would be developed fully before future sites, the remaining demand was then apportioned pro-rata over the remaining future capacity.

The growth of total households in the sub areas along with the split in current greenfield and future development is shown in Table 2.2. The estimate of total dwelling capacity and uptake to 2034 in greenfield locations, RRAs, and potential medium density developments calculated from average lot sizes are shown in Table 2.3.

Table 2.2 Subarea residential forecasts for total dwellings

Sub Area	2034 Total Growth	Greenfield (Current)	Remaining Growth	Future Greenfield and MDR Estimate	Uptake of Future Cap to 2034
Cromwell	1,466	1,218	248	565	338
Bannockburn	197	140	57	60	58
Pisa Moorings	348	100	248	360	280
Lindis-Nevis Valleys	349	166	183	61	61
Total	2,360	1,624	736	1,046	736

Table 2.3 Greenfield Residential Dwelling Capacity Estimates and total uptake

Growth Area	Greenfield Cap (Current)	Future Greenfield and MDR Estimate Cap	Total Uptake
RR12, including additional anticipated medium density	446	303	626
RR3	38	0	38
Ripponvale PC14 development	136	0	136
Wooing Tree Masterplan area	219	0	219
Top 10 holiday park development	180	0	180
Gair Ave / Olds Cres development	267	0	267
Freeway Orchard development	0	263	157
River Terrace and Highlands	68	0	68
Bannockburn	140	0	140
Domain Rd, Bannockburn	0	60	58
Pisa Moorings, including additional anticipated medium density	100	360	380
Lowburn	30	61	91
Total	1,624	1,046	2,360

Once the current greenfield dwellings were assigned there were 736 dwelling remaining to be assigned to future development areas. Assigning the remaining anticipated growth from each subarea projection resulted in an excess of 122 dwellings in the Lindis-Nevis Valley. This demand was reapportioned to the other subareas pro-rata over the remaining capacity in each area, resulting in an additional 90 dwellings in Cromwell, 32 dwellings in Pisa Moorings, and 1 dwelling in Bannockburn. It should be noted that if additional infill and greenfield development was proposed in the Lindis-Nevis Valley it would be expected to reduce the pro-rata apportionment.

2.3 Commercial Growth Apportionment

Town Centre Commercial and Existing Industrial

The revised 2050 methodology included increasing the commercial activity by 20% across the study area including the Town Centre. This growth was factored to match the expected employment growth in the revised 2034 forecasts for Cromwell township. Where previous grow from 2018 to 2050 was 3,363 jobs, the revised Cromwell growth forecasts from 2018 to 2034 is 1,601 jobs resulting in a factor of 48% of expected 2050 growth. This corresponds to a Town Centre growth of 9.6% from 2018 to 2034.

Rural Industrial and Agricultural

Rural employment growth is significantly high in the revised 2034 projections compared to the previous 2050 projections. For this reason, rural growth has been factored by the projected increase in employment between 2018 and 2034. The revised growth is 1,865 jobs, from 2,000 in 2018 to 3,865 in 2034, a growth factor of 93%. For comparison, the previous 2050 growth in rural employment was 76 jobs, a growth factor of 3.8%.

McNulty Industrial Area and Industrial Plan Change Area

The industrial areas south of McNulty Rd were analysed further as this is a key growth area with capacity to accommodate future development. The recently consented industrial subdivision in the east of the McNulty industrial area (covering Harvest Rd, Cemetery Rd, and Old Saleyards Rd) was included in this analysis as it would be expected to develop in line with existing industrial areas over the short to medium term.

The recent consented development analysis with the model was used to inform the analysis of the future baseline and scenario with the industrial plan changes. This included calculating a total floor area from the total site area assuming 77% coverage once roads and other areas are established and the 30% utilisation of land in buildings. The Cromwell Masterplan identified the total areas of the industrial areas as follows in Figure 2.1 and the industrial plan change considered covers Area 19 and Area 20.

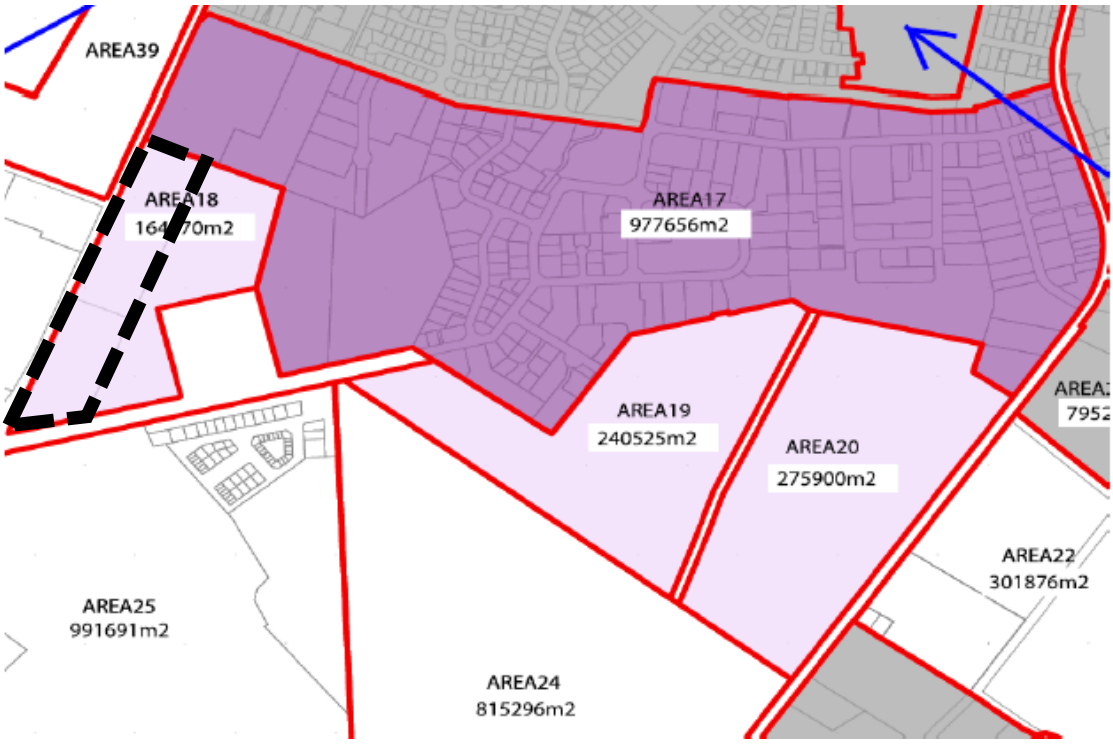

Figure 2.1 Scale of Industrial areas and Plan Change site, note only the portion of Area 18 in black dashed lines is included

A detailed study undertaken to check the coverage and utilisation rates within the existing McNulty industrial areas from aerial photography. The coverage was deemed appropriate however the utilisation ranged somewhat with a denser warehousing block having a utilisation of 38% but more typical areas ranging from 15% to 25%. The average utilisation ranged from 18% to 22% depending on the inclusion of the warehousing block, so a utilisation rate of 20% has been adopted in this analysis. The calibrated trip rate from the existing McNulty area was retained and applied to any infill available in the area, whereas the evening peak hour rate for the recently consented development (1.3trips per 100m2 GFA) was used for development in new industrial areas including the proposed Plan Change development.

The total area of the McNulty Industrial area that can be utilised is calculated to be approximately 150,000m2 GFA. Of the total available area approximately 111,600 is existing and the consented site would take up 26,700m2.

To make this area fully utilised for the Baseline Scenario the existing floorspace and trip making activity is scaled by 1.105. The breakdown of utilised land and associated trip generation of the industrial areas is shown in Table 2.4.

Table 2.4 Existing and Proposed Industrial Building areas, 2050 future year

Industrial Area	Raw Area	Site Coverage (77%)	Utilisation (20%)	PM peak hour trips	PM 2 hour total
Existing 2018 McNulty	978,000	n/a	111,600	1,515	2,714
Recent Consented Area	174,000	134,000	26,700	347	622
Total 2050 Baseline	978,000		150,100	2,022	3,621
PC Area 20 (Z303)	276,000	212,000	42,350	551	986
PC Area 19 (Z303)	241,000	185,000	36,900	480	860

Industrial Area	Raw Area	Site Coverage (77%)	Utilisation (20%)	PM peak hour trips	PM 2 hour total
PC Area 18 (Z314)	93,000			**	**

To obtain the two-hour demand the peak hour demand is scaled by 1.791, as per the base model. The overall interpeak activity from the industrial areas has been derived by comparing the base model total volumes in the two-hour evening peak period to the five-hour interpeak period, resulting in a scaling factor of 1.597 to get from evening peak demand to interpeak demand.

As with the Town Centre 2034-year job growth, the industrial growth for the 2034 year was factored in line with the overall growth of employment in Cromwell. The total two-hour, two-way trips in Area 19 and Area 20 (1,846 trips in 2050) were factored by 48% to give the equivalent growth to 2034. This assumes that the Plan Changes areas will develop at the same rate as remaining industrial areas and any additional infill within the existing industrial zoning.

After the 2050 future year model development, Area 18 was partially notified as part of Plan Change 19. To calculate the trip generation in the 2034 future year the area covered by Area 18 was estimated as 93,000sqm and trips were reapportioned from the total calculated for Area 19 and Area 20. The total trips assigned to each Plan Change Area for the 2034 future year are as in Table 2.5.

Table 2.5 Plan Change 19 Trip Generation, 2034 future year

Industrial Area	Raw Area	PM peak hour trips	PM 2 hour total
PC Area 20	276,000	234	420
PC Area 19	241,000	204	366
PC Area 18 (partial)	93,000	76	137

2.4 Excluding Plan Change Scenario Landuse

The 2022 growth projections are predicated on a suitable amount of land capacity to meet the employment expectations in the sub-area. This means that the baseline landuse developed with these projections includes area for industrial expansion implicitly, and for this reason it was decided to modify an 'excluding industrial expansion' scenario to test the potential impacts of not providing Area 19 and Area 20 for industrial use.

The following high-level assumptions were used to reallocate the trips generated by Area 19 and Area 20:

1. An increase in utilisation of existing industrial area would be assumed, 50% of the trip total has been reallocated to existing industrial activity along McNulty Rd.
2. Some industrial activity would relocate to nearby areas, 25% of the trip total has been reallocated to the Wanaka and Alexandra external connections which represents an increase in interaction between Cromwell residents and external employment.
3. Some industrial activity either leaves the area completely (i.e. completely self-contained within another area) or does not occur, the balance of 25% of trips were not reallocated which represents these trips being either fully external to the area or not being undertaken in the first place.

The trip allocation assumptions result in an increase in vehicle travel along both SH6 northbound and SH8 southbound, as well as increasing vehicle travel along McNulty Rd. This has impacts on McNulty Rd intersections as noted in Section 4.

2.5 External Zone Traffic Volume Growth

The most recent Average Annual Daily Traffic (AADT) volumes for the four roads representing the external connections of the model were obtained from Waka Kotahi, covering the ten years from 2012 to 2022. There was a noticeable drop in the 2020 count values due to effects from Covid19 travel restrictions. The average growth across all sites from 2016 to 2019 was 4.35% annually which aligned with the population growth of Cromwell in the 2016 and 2017 years as shown in the Cromwell Masterplan report.

The development of the 2034 future year has coincided with an update of the Queenstown Lakes District Strategic Transportation Model, which includes a high-level representation of Cromwell. This model has been used to inform changes on SH6 to the south-west (Kawarau Gorge) and north-west (towards Wanaka) external connections, and account for changes in wider landuse interactions between Cromwell and the wider Queenstown Lakes district. The growth rates for each external connection are shown in Table 2.6 for the interpeak and evening peak periods.

Table 2.6 External volume growth 2018 – 2034 by period

External Connection	Interpeak Growth 2018 - 2034	PM Peak Growth 2018 - 2034
SH8 Southeast	24%	39%
SH8 Northeast	1%	4%
SH6 Northwest	113%	87%
SH6 Southwest	11%	10%

3. Future Year Network

3.1 Baseline Network

The initial road network set up for the 2034 future year was generally in line with the 2018 base network. A key infrastructure input is a new single lane roundabout at the SH6 and SH8B intersection which has been coded in line with the layout constructed under NZUP[1]. Also included is the newly constructed roundabout at the SH8B and Barry Ave intersection, including the northern leg which forms the main access to the Wooing Tree development. The area surrounding the SH6 and SH8B intersection is shown in Figure 3.1.

Figure 3.1 Modelled Network near SH6 and SH8B intersection

The 2018 network was simplified when it was set up with many intersections with single lane approaches. The future network operation was observed for performance issues that were related to this, with additional capacity added where there is existing space for vehicles to pass another that is waiting to turn. This was not a response to provide additional capacity over what is already provided but to better match the existing intersection layouts.

The main additional network detail in the consented industrial subdivision was new network constructed extending Harvest Road to connect McNulty Road and Cemetery Road.

[1] https://www.nzta.govt.nz/projects/sh6-sh8b-cromwell-intersection-improvements/

3.2 Network with Proposed Industrial Plan Changes

There are presently no details on what the road network would look like within the proposed industrial plan changes, this would normally be presented as part of an Outline Development Plan (ODP). However, the likely main roads that would serve these large areas have been assumed for this testing stage. For the two south-eastern sites a new road has been assumed on the south-western boundary of both sites between Bannockburn Road and Cemetery Road. Another link has been assumed to run off this new road between the two sites, connecting them both into the existing area via the western side of Ree Crescent. The industrial area network including the proposed Plan Change sites is shown in Figure 3.2.

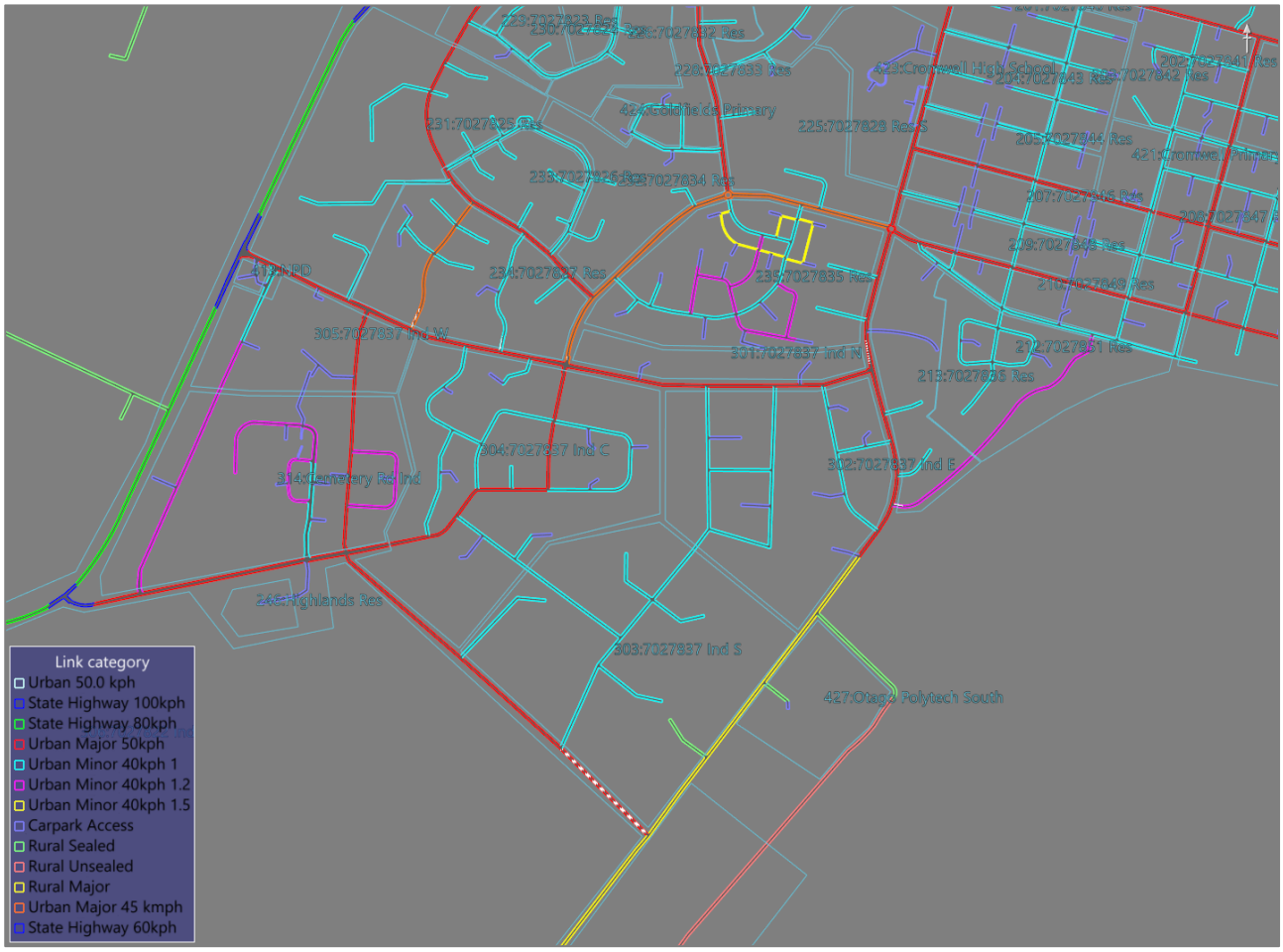

Figure 3.2 Modelled Network near industrial plan changes

3.3 McNulty Road Upgrade Options

The capacity of intersections along McNulty Road has been noted by CODC as a significant bottleneck, especially the intersection of McNulty Road and SH6. The current intersection configuration is a priority T intersection, with McNulty Rd as the minor leg. There is a short, painted acceleration lane northbound, however it is not clear what proportion of vehicles utilise the additional space.

The do minimum scenario is proposed to include Safe Intersection Speed Zones (shown in blue in Figure 3.2) for the SH6 intersections at both Cemetery Rd and McNulty Rd. This reduces the operating speed along SH6 to 60 kph through variables messaging signs when a vehicle is detected on the minor road approach. The option scenario replaces the McNulty Rd and SH6 intersection with an

appropriately sized single-lane roundabout. The priority crossroads at the McNulty Rd and Gair Ave intersection is also replaced with a single-lane roundabout as significant queueing was observed there during initial testing of the base network in the 2034 future year model. The option network on McNulty Rd is shown in Figure 3.3.

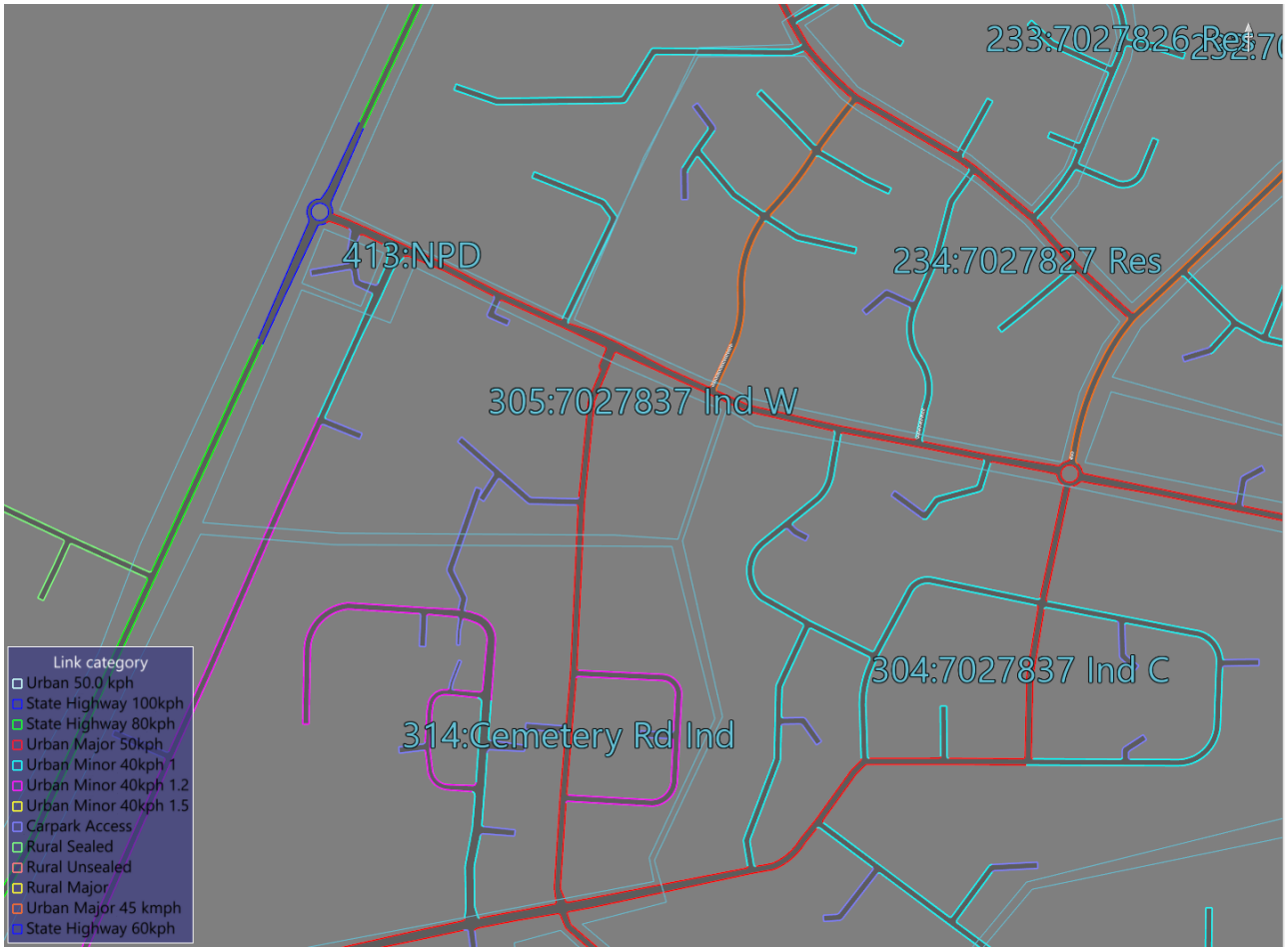

Figure 3.3 Modelled option network on McNulty Road, alterations circled in red

4. Future Model Operation Comparison

4.1 Interpeak Model Performance

Results show good performance in the interpeak hour in both with and without the proposed industrial plan changes. Changes in intersection delay are low and level of service is mostly very good, with no intersection exceeding LOS B in any scenario. For this reason, the following result summaries focus on the evening peak hour.

4.2 Intersection Performance Excluding Industrial PC Areas

The performance of key intersections has been summarised in Table 4.1 for the 2034 evening peak hour. These results cover the baseline scenario, being the projected 2034 landuse excluding the industrial plan changes and without infrastructure upgrades on McNulty Rd.

The evening peak periods are much busier than the interpeak period, which is reflective of the 2018 base model, and there are several intersections which experience degraded performance, most notably:

- SH6 / McNulty Rd operates at a LOS E for the McNulty Rd approach, indicating that this intersection is operating close to the practical capacity of the intersection. This is likely to result in degraded intersection performance, with long queues and more variables delays experienced by vehicles accessing SH6.
- McNulty Rd / Gair Ave priority crossroads operates at LOS F for the southern Gair Ave approach, indicating that this intersection is operating in excess of the practical capacity of the intersection. In practice, this will often result in an increase in rat-running as vehicles attempt to bypass the congested intersection. It can also result in drivers selecting smaller gaps than during normal operation, potentially leading to an increase in safety issues.
- Several intersections around the town centre are operating at LOS C, including the roundabout at SH6 / SH8B. This is generally acceptable in peak hour and is not indicative of performance issues.

Table 4.1 2034 Baseline Scenario Evening Peak Hour intersection performance

Intersection	Baseline - 2034 exc Plan Changes, Do Minimum		
	Volume	Delay (s)	LOS
SH6 / Pisa Moorings Rd / Clark Rd	1330	11.5	B
SH6 / Lowburn Valley Rd	1471	13.0	B
SH6 / Burn Cottage Rd	1471	3.2	A
SH6 / Shortcut Rd	1492	2.2	A
SH6 / SH8b	1971	24.6	C
SH6 / Ripponburn	1095	5.9	A
SH6 / Ripponvale Rd	1097	20.2	C
SH6 / McNulty Rd	1211	45.9	E
SH6 / Ord Rd	711	5.7	A
SH6 / Cemetery Rd	810	7.3	A
SH6 / Sandflat Rd	403	6.0	A
SH6 / Pearson Rd / Ripponvale Rd	324	5.3	A
SH8b / Sargood Rd	1355	27.5	D
SH8b / Barry Ave	1221	11.0	B
SH8b / Shortcut Rd	631	23.8	C
SH8b / Bell Ave	527	6.1	A
SH8b / Alpha St	857	13.8	B
SH8 / SH8b	997	5.7	A
Sargood / Iles St	1124	19.4	C
Barry Ave / Waenga Dr	1293	9.2	A

Intersection	Baseline - 2034 exc Plan Changes, Do Minimum		
Barry Ave / Neplusultra St	1263	22.6	C
Barry Ave / Molyneaux Ave	1124	17.9	C
Barry Ave / Inniscort St / Gair Ave	1156	4.9	A
Gair Ave / Jollys Rd	280	4.8	A
McNulty Rd / Gair Ave	794	75.6	F
Barry Ave / McNulty Rd	751	10.4	B

The pattern of traffic volumes around the township can be seen in Figure 4.1 for the evening peak hour.

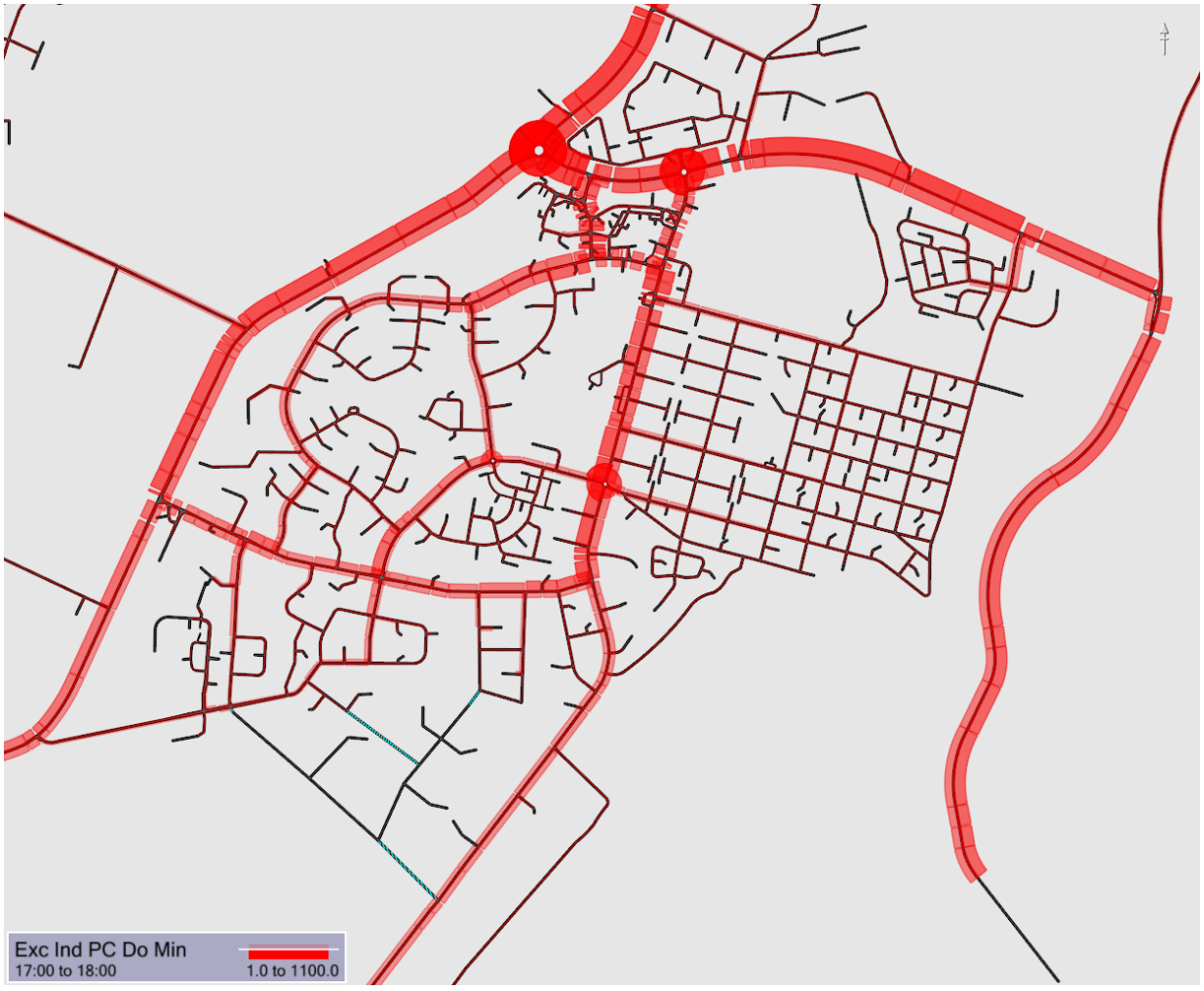

Figure 4.1 Evening Peak Hour Volumes for 2034 Baseline scenario

The 2034 future year model sees significant growth around the township compared to the 2018 base model. The change in volume in the evening peak period between 2018 and 2034 is shown in Figure 4.2, noting that this comparison has been made over the updated 2034 do minimum network.

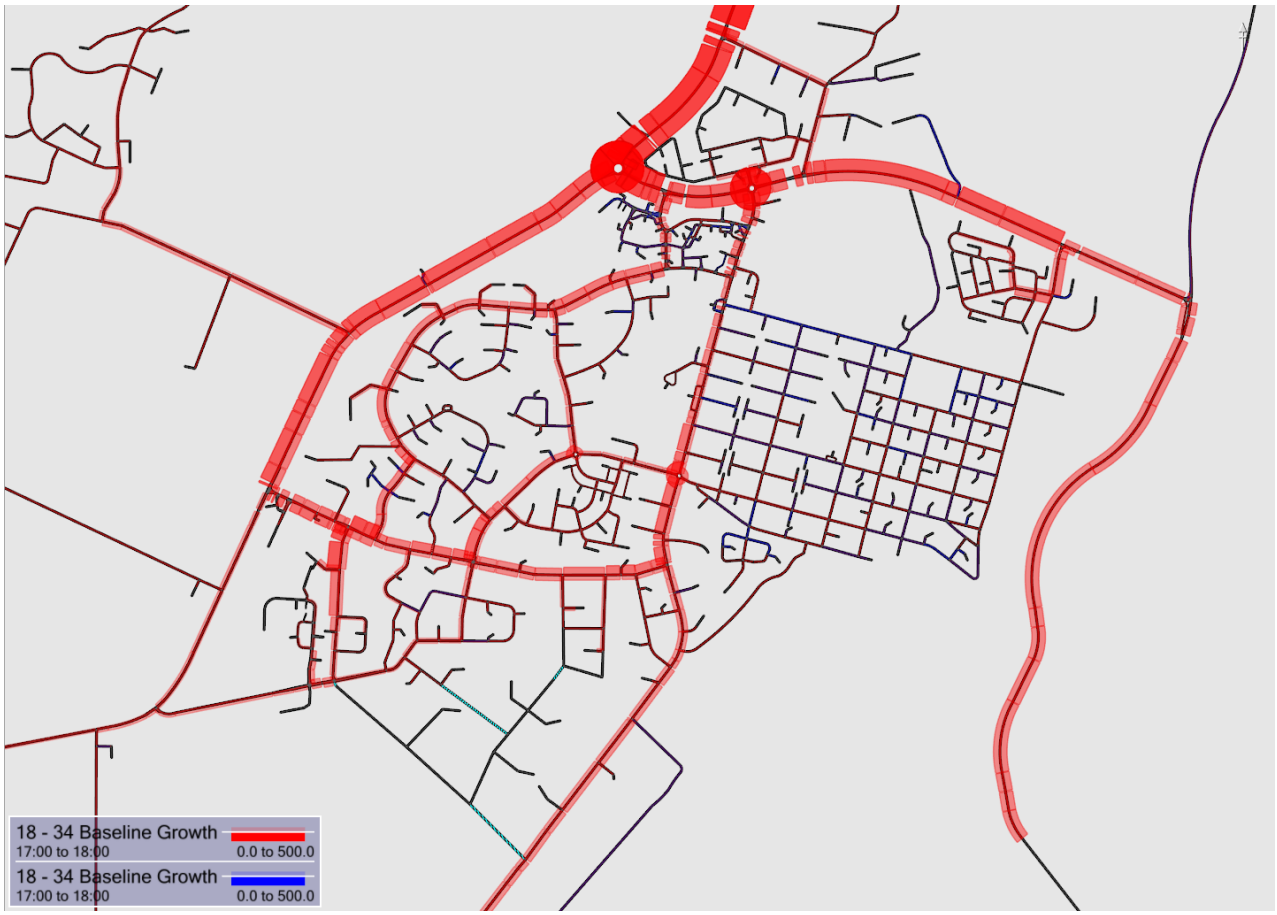

Figure 4.2 Evening Peak Hour Volume Change, 2018 to 2034, on 2034 do minimum network

4.3 Intersection Performance Including Industrial PC Areas

The performance of key intersections has been summarised in Table 4.2 for the 2034 evening peak hour. These results cover the option landuse scenario, being the projected 2034 landuse including the industrial plan changes and without infrastructure upgrades on McNulty Rd.

Key changes in intersection and network performance with the inclusion of the Area 19 and Area 20 industrial areas are as follows:

- The largest impact on the network performance comes from the addition of the plan change access road, which creates a direct link with Harvest Rd between McNulty Rd and Bannockburn Rd. This removes vehicle trips from McNulty east of Harvest Rd, which in turn improves intersection performance for the eastern minor road approaches to McNulty Rd. The McNulty Rd / Gair Ave intersections operates much more efficiently compared to the baseline scenario, improving to LOS D on the worst performing approach.
- The SH6 / McNulty Rd intersection is clearly operating in excess of capacity, and an increase in vehicle trips is not able to be accommodated on the McNulty Rd approach.
- There is a small increase in volumes on Cemetery Rd, however the intersection still operates well within capacity limits.

Table 4.2 2034 Including Plan Change Scenario Evening Peak Hour intersection performance comparison

Intersection	2034 Including Plan Change, Do Min			Change from Baseline	
	Volume	Delay	LOS	Volume	Delay
SH6 / Pisa Moorings Rd / Clark Rd	1299	9.3	A	-31	-2.1
SH6 / Lowburn Valley Rd	1445	14.4	B	-26	1.4
SH6 / Burn Cottage Rd	1444	2.8	A	-26	-0.4
SH6 / Shortcut Rd	1467	2.2	A	-26	0.0
SH6 / SH8b	1977	19.3	B	6	-5.3
SH6 / Ripponburn	1144	6.1	A	49	0.2
SH6 / Ripponvale Rd	1147	28.1	D	50	7.9
SH6 / McNulty Rd	1242	64.7	F	31	18.8
SH6 / Ord Rd	724	6.1	A	14	0.3
SH6 / Cemetery Rd	846	11.1	B	37	3.7
SH6 / Sandflat Rd	390	6.7	A	-13	0.7
SH6 / Pearson Rd / Ripponvale Rd	319	5.3	A	-6	0.0
SH8b / Sargood Rd	1315	24.5	C	-40	-3.0
SH8b / Barry Ave	1180	11.0	B	-42	0.0
SH8b / Shortcut Rd	591	23.6	C	-40	-0.2
SH8b / Bell Ave	498	6.7	A	-29	0.5
SH8b / Alpha St	825	14.2	B	-32	0.5
SH8 / SH8b	947	5.0	A	-50	-0.8
Sargood / Iles St	1105	17.7	C	-19	-1.7
Barry Ave / Waenga Dr	1280	9.4	A	-14	0.2
Barry Ave / Neplusultra St	1257	22.6	C	-6	0.0
Barry Ave / Molyneaux Ave	1143	15.9	C	20	-2.0
Barry Ave / Inniscort St / Gair Ave	1200	5.3	A	44	0.3
Gair Ave / Jollys Rd	281	4.7	A	1	-0.1
McNulty Rd / Gair Ave	748	26.2	D	-45	-49.4
Barry Ave / McNulty Rd	676	9.3	A	-75	-1.1

The change in traffic patterns as a result of the industrial plan changes is shown in Figure 4.3.

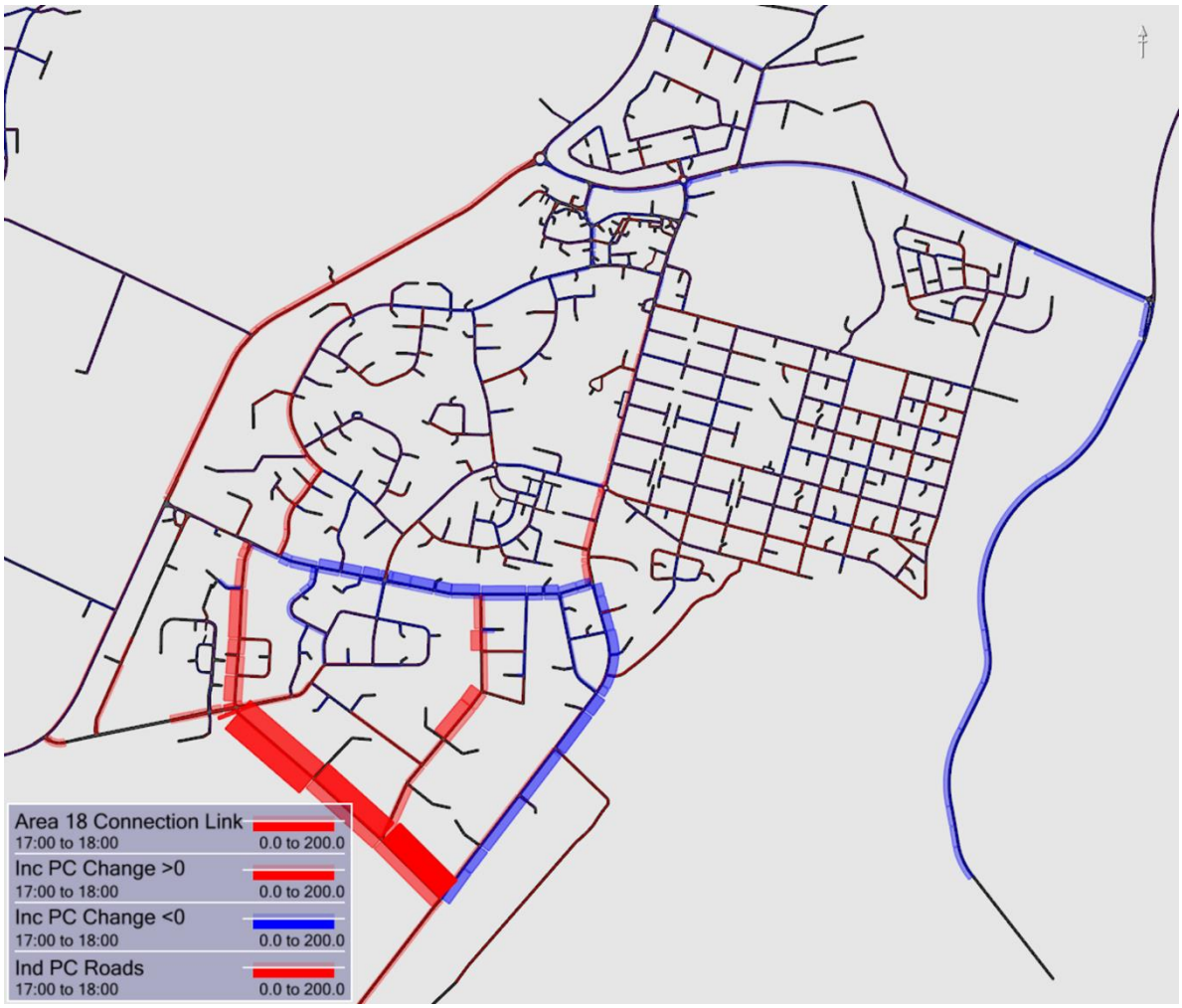

Figure 4.3 Evening Peak Hour Volume Change including Industrial Plan Change

4.4 Intersection Performance with McNulty Rd Upgrades

Testing of the landuse scenarios in Section 4.2 and 4.3 demonstrates that the key intersections experiencing congestion and capacity constraints are the priority intersections at SH6 / McNulty Rd and McNulty Rd / Gair Ave.

The do-minimum infrastructure at SH6 / McNulty Rd is proposed to include a 60 kph Safe Intersection Speed Zone and formalisation of the seagull arrangement for the right turn, so the next logical progression is to an appropriately sized roundabout.

Due to the context of major intersections surrounding the McNulty Rd / Gair Ave, as well as safety considerations, a roundabout was considered the most appropriate infrastructure upgrade at that location also. It should be noted that these intersection arrangements have been tested at a high-level concept design stage only, and further refinement would be expected at the detailed design stage to ensure the geometry and lane configuration is appropriate for expected heavy vehicle volumes as well as other vulnerable road users.

Including single-lane roundabouts at the intersections of SH6 / McNulty Rd and McNulty Rd / Gair Ave provides significant increases in capacity, improving intersection to LOS A in both cases. This reduces rat-running of vehicles turning right at Cemetery Rd, as well as reducing vehicles rat-running via Pinot

Noir Dr to avoid queueing at Gair Ave. This represents a network operating far more efficiently than the do-minimum scenarios.

The performance of key intersections has been summarised in Table 4.3 for the 2034 evening peak hour. These results cover the baseline scenario, being the projected 2034 landuse including the industrial plan changes and infrastructure upgrades on McNulty Rd.

Table 4.3 2034 Including Plan Change and McNulty RABs Scenario Evening Peak Hour intersection performance comparison

Intersection	2034 including Plan Change, RABs			Change from including PC, Do-Min	
	Volume	Delay	LOS	Volume	Delay
SH6 / Pisa Moorings Rd / Clark Rd	1288	10.1	B	-11	0.8
SH6 / Lowburn Valley Rd	1436	16.3	C	-9	1.9
SH6 / Burn Cottage Rd	1439	3.5	A	-6	0.7
SH6 / Shortcut Rd	1461	2.3	A	-6	0.1
SH6 / SH8b	1972	21.7	C	-5	2.3
SH6 / Ripponburn	1144	6.4	A	0	0.3
SH6 / Ripponvale Rd	1140	26.9	D	-7	-1.1
SH6 / McNulty Rd	1230	4.0	A	-12	-60.7
SH6 / Ord Rd	673	5.5	A	-51	-0.5
SH6 / Cemetery Rd	802	7.7	A	-44	-3.4
SH6 / Sandflat Rd	378	6.5	A	-12	-0.2
SH6 / Pearson Rd / Ripponvale Rd	314	5.1	A	-5	-0.1
SH8b / Sargood Rd	1307	23.3	C	-8	-1.3
SH8b / Barry Ave	1170	11.0	B	-10	0.0
SH8b / Shortcut Rd	588	21.5	C	-3	-2.1
SH8b / Bell Ave	491	4.5	A	-7	-2.1
SH8b / Alpha St	820	14.8	B	-5	0.6
SH8 / SH8b	939	5.5	A	-9	0.5
Sargood / Iles St	1090	15.5	C	-15	-2.2
Barry Ave / Waenga Dr	1277	9.1	A	-3	-0.3
Barry Ave / Neplusultra St	1253	31.2	D	-5	8.6
Barry Ave / Molyneaux Ave	1141	17.7	C	-3	1.8
Barry Ave / Inniscort St / Gair Ave	1164	5.9	A	-36	0.6
Gair Ave / Jollys Rd	275	5.1	A	-6	0.4
McNulty Rd / Gair Ave	768	4.1	A	20	-22.1
Barry Ave / McNulty Rd	688	7.5	A	12	-1.8

The change in traffic patterns as a result of the McNulty Rd upgrades is shown in Figure 4.4.

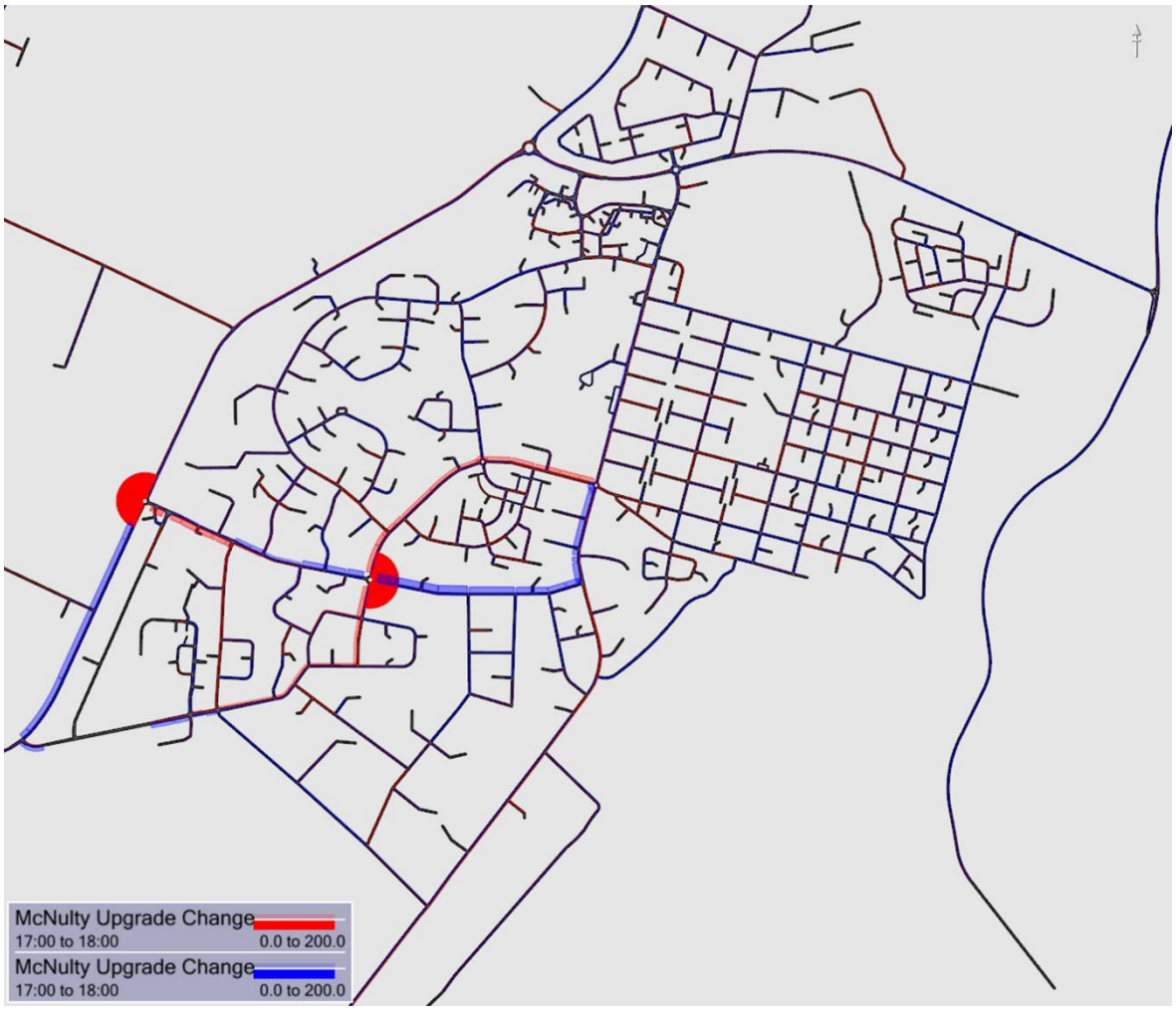

Figure 4.4 Evening Peak Hour Volume Change including RABs (disregard increases at roundabouts)

4.5 SH6 / McNulty and SH6 / Cemetery Performance Summary

The performance of individual turning movements and approaches at the intersections of SH6 / McNulty Rd and SH6 / Cemetery Rd are shown in **Appendix A** for each of the four scenarios tested.

5. Full Industrial Plan Change Development Sensitivity Test

5.1 Landuse and Trip Distribution Summary

Following an earlier review of this technical note by Waka Kotahi representatives, a sensitivity test was requested where the Industrial Plan Change area was completely developed in the 2034 future year, rather than the baseline development level of 50%.

This sensitivity test requires alteration to several growth assumptions utilised in the central-case modelling, namely:

- Full uptake of available land within the Industrial Plan Change area with lead to employment supply significantly in excess of the 2034 level forecast within the Rationale-prepared growth projections for the Cromwell Ward.
- Preferential uptake of the greenfield Industrial Plan Change land will suppress the uptake and intensification of currently zoned industrial activity, when compared to the central-case development modelling.
- Increased supply of employment within Cromwell township will alter current journey to work trends compared to the central-case modelling, attracting a greater number of trips from beyond the model boundary while also redirecting trips that would be expected to travel beyond the model boundary in the central-case modelling.
- Residential household growth and distribution is maintained unchanged from the central-case modelling.
- Commercial activity with the Cromwell Town Centre and Wooing Tree commercial centre is maintained unchanged from the central-case modelling.

In the evening peak period (2hr) increasing the Industrial Plan Change land to 100% utilisation results in additional generation of 575 trips and additional attraction of 210 trips.

To update the trip distribution changes resulting from the additional growth the following updates were made:

1. Reduction of growth in existing zoned industrial from 10% in the central-case modelling to 3%, representing the preferential shift to greenfield development
    a) This industrial growth was transferred to Plan Change 18 land
2. Offset increased employment supply against existing journey to work trends for inbound and outbound directions
    a) Half remaining additional generation after step 1 reallocated from External – Internal to Plan Change 18 – Internal, representing a decrease in journey to work trips departing the Cromwell area in the morning peak
    b) Half remaining additional generation after step 1 allocated to Plan Change 18 – External, weighted by current journey to work proportions and current external volumes, representing an increase in journey to work trips arriving in Cromwell in the morning peak
        i. Weighted proportions: Alexandra 67%, Tarras 4%, Wanaka 17% Queenstown 12%
3. Increase trips to Plan Change 18 to balance increased activity, split evenly between External – Plan Change 18 and Internal – Plan Change 18 weighted by baseline trip patterns

The summary of reallocated (384 trips) and new (401 trips) trips for the PM peak period (2hr) are shown in Table 5.1 and Table 5.2, respectively.

Table 5.1 Sensitivity Test PM Peak Reallocated Trip Summary

Distribution Step	Inbound from		Outbound to	
	External	Internal	External	Internal
1 Shift growth from existing industrial to PC18		40		113
2 Employment supply change impact on JTW trends				231
3 Balance inbound trips from increased activity				
Total Reallocated Trips Inbound to PC18 = 40		40		
Total Reallocated Trips Outbound from PC18 = 344				344
Overall Reallocated Trips = 384		40		344

Table 5.2 Sensitivity Test PM Peak New Trip Summary

Distribution Step	Inbound from		Outbound to	
	External	Internal	External	Internal
1 Shift growth from existing industrial to PC18				
2 Employment supply change impact on JTW trends			231	
3 Balance inbound trips from increased activity	85	85		
Total New Trips Inbound to PC18 = 170	85	85		
Total New Trips Outbound from PC18 = 231			231	
Overall New Trips = 401	85	85	231	

The net effect of these changes is to strengthen the relationship between industrial employment and residential/ commercial activity within the Cromwell Town Centre. This is a combination of effects from both shifting growth from the existing industrial area and reducing commuting trips seeking employment outside the model area. An increase in commuting trips is forecast, mostly increasing Cromwell to Alexandra trips in the PM peak due to the increased employment supply within the model boundary.

5.2 Network Performance including Full Industrial Plan Change Development

The sensitivity test trip distribution was assigned against the central-case 2034 Plan Change 18 network with no further upgrades.

Given the network performance issues noted in the central-case 2034 un-upgraded SH6 model, see Section 4.3, this sensitivity test has not been applied to the un-upgraded SH6 version.

Observation of the model in operation did not signal any notable performance issues, all traffic was able to navigate the network and no significant queues were visible.

Compared to the central-case modelling, the main increases in vehicle volumes occur on the main links between the Plan Change 18 area and SH6, and the Plan Change 18 area and Cromwell Town Centre.

The additional volume in the evening peak hour is between 60 vehicles (SH6 northbound) and 100 vehicles (Barry Ave northbound). Most additional vehicles utilising Barry Ave are routing through to Alexandra, not the town centre area. The most notable volume changes in the vicinity of Plan Change 18 are shown in Figure 5.1.

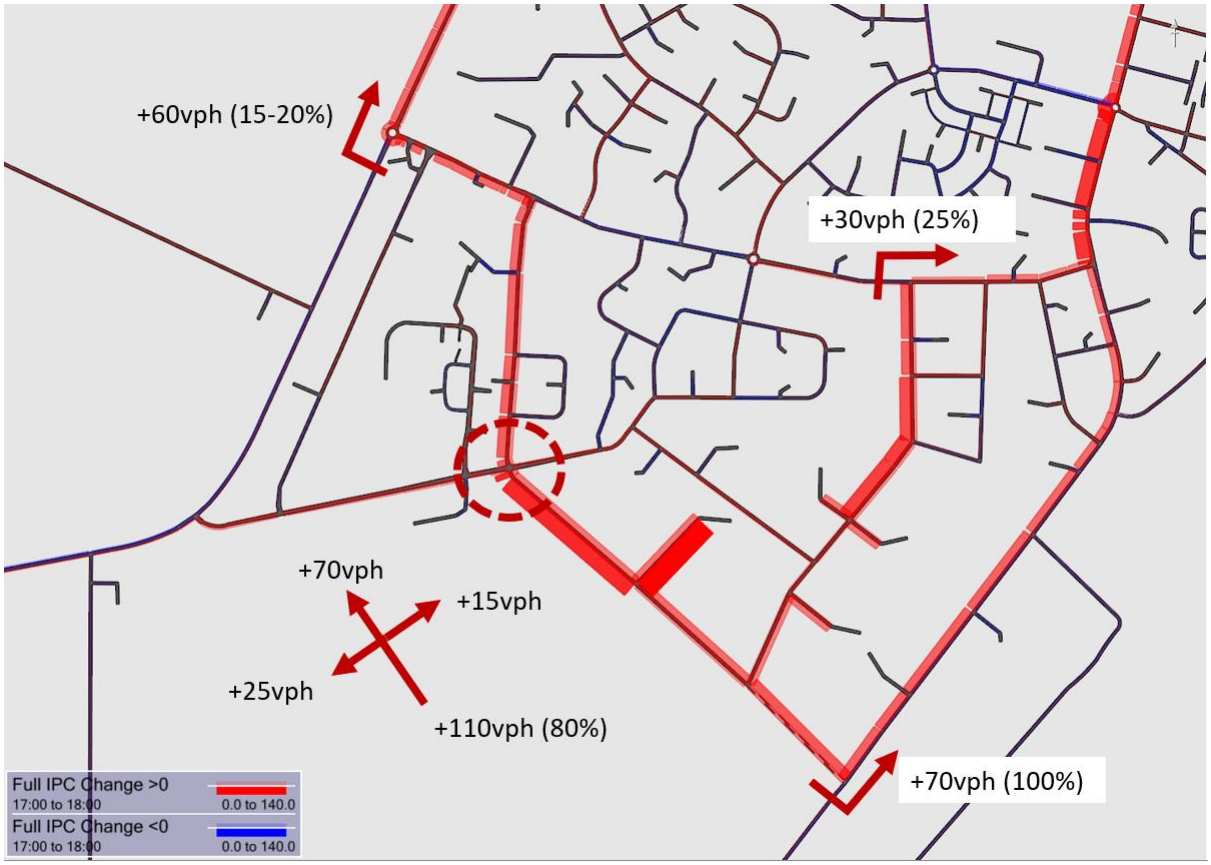

Figure 5.1 Evening Peak Hour Sensitivity Test Volume Changes Near PC18

5.3 Incremental Impact on Network Performance due to Full Industrial Plan Change Development

No significant increases in intersection delay were noted, with the intersections experiencing additional volumes, especially SH6/ McNulty and SH8/8b, operating within capacity.

The most notable intersection performance changes observed in the evening peak were:

- SH8b/ Shortcut Rd from 22s to 34s delay (LOS D). This is due to increase in eastbound volumes on SH8b, as well as Shortcut Rd being used as a rat run
- SH8b/ Barry from 11s to 17s delay (LOS C) due to increase in Industrial Plan Change volumes, operates well through peak
- SH6/ SH8b from 22s to 25s delay (LOS C). Operates well as single lane RAB, unlikely to require upgrade to dual circulating lane at the level of development tested
- SH6/ Ripponvale from 27s to 29s delay (LOS D). Level of Service acceptable but recommend monitoring as SH6 and Ripponvale development volumes increase
- SH6/ McNulty as a roundabout remains around 4s delay (LOS A). High level of service and operates well within capacity as a single-lane RAB

The performance of key intersections has been summarised in Table 5.3 for the 2034 evening peak hour. These results cover the sensitivity test scenario, being the projected 2034 landuse including the full development of the industrial plan changes and infrastructure upgrades on McNulty Rd.

Table 5.3 2034 Plan Change Sensitivity Test Scenario Evening Peak Hour intersection performance comparison

Intersection	2034 100% Sensitivity Test, RABs			Change from including PC, RABs	
	Volume	Delay	LOS	Volume	Delay
SH6 / Pisa Moorings Rd / Clark Rd	1302	9.1	A	14	-1.0
SH6 / Lowburn Valley Rd	1456	15.3	C	20	-1.1
SH6 / Burn Cottage Rd	1458	2.4	A	20	-1.1
SH6 / Shortcut Rd	1480	2.2	A	19	-0.1
SH6 / SH8b	2043	24.7	C	72	3.0
SH6 / Ripponburn	1224	5.7	A	81	-0.6
SH6 / Ripponvale Rd	1224	29.2	D	84	2.2
SH6 / McNulty Rd	1307	4.2	A	78	0.2
SH6 / Ord Rd	668	5.6	A	-6	0.1
SH6 / Cemetery Rd	816	8.1	A	14	0.3
SH6 / Sandflat Rd	397	5.8	A	19	-0.7
SH6 / Pearson Rd / Ripponvale Rd	327	5.5	A	13	0.3
SH8b / Sargood Rd	1305	21.4	C	-2	-1.8
SH8b / Barry Ave	1214	16.7	C	44	5.7
SH8b / Shortcut Rd	561	34.3	D	-27	12.8
SH8b / Bell Ave	474	4.4	A	-17	-0.2
SH8b / Alpha St	788	17.8	C	-32	2.9
SH8 / SH8b	989	5.8	A	50	0.3
Sargood / Iles St	1097	15.9	C	7	0.4
Barry Ave / Waenga Dr	1327	9.9	A	50	0.7
Barry Ave / Neplusultra St	1315	31.6	D	62	0.4
Barry Ave / Molyneaux Ave	1214	20.1	C	73	2.4
Barry Ave / Inniscort St / Gair Ave	1265	6.5	A	102	0.6
Gair Ave / Jollys Rd	266	5.1	A	-9	0.0
McNulty Rd / Gair Ave	787	4.1	A	19	0.0
Barry Ave / McNulty Rd	751	12.9	B	63	5.4

6. Recommendations

The modelling has indicated where the key network effects are forecast to occur on the network due to the proposed industrial plan changes. From the results presented we have the following recommendations:

- Upgrades are required for the SH6 intersection at McNulty Rd irrespective of the Industrial Plan Change, however it is noted that the inclusion of the plan change landuse does increase demands on SH6 / McNulty Rd.
    - A roundabout is likely to form the most suitable upgrade of the SH6 / McNulty Road intersection and is expected meet the performance threshold for requirement in the baseline and plan change scenarios. The modelling has assumed that this will be upgraded to a roundabout to futureproof the performance of the State Highway 6 corridor.
    - Cemetery Road is not expected to require upgrades to increase capacity, however movement restrictions or additional safety treatments could be considered in conjunction with the provision of greater capacity and level of service at the McNulty intersection. The modelling has assumed that this will be upgraded to include a 60 kph Safe Intersection Speed Zone SISZ) treatment to futureproof the performance of the State Highway 6 corridor.
    - Further assessment and engagement with Waka Kotahi will be required to confirm the most suitable form for these intersections and understand the timing of these upgrades along the corridor.
- An upgrade of the McNulty Rd / Gair Ave intersection is recommended regardless of the plan change being implemented and a roundabout is likely to be the most suitable form. This upgrade is less urgent with the plan change implementation as the additional link road is expected to remove some traffic from McNulty Rd.
- Additional sensitivity testing of the level of industrial development in the Plan Change 18 area demonstrates that the recommended upgrades on McNulty Road remain suitable with the full development of the Industrial Plan change site. No additional network performance issues were identified beyond those identified above.
- Based on the transport modelling assessment, it is concluded that the intersections of SH6 / McNulty, SH6 / Cemetery Road and McNulty/Gair Ave require upgrades in the next ten years to respond to existing planned and zoned growth in Cromwell. The Industrial Plan Change proposal adds traffic to these three intersections, and this traffic can comfortably be accommodated on the transport network following the implementation of suitable upgrades in response to Business-As-Usual growth.
- It is further recommended that should the rezoning be approved, an Integrated Transportation Assessment report be prepared at resource consent stage in line with Waka Kotahi guidance[2] to fully assess the effects of any future traffic generated on the Plan Change site. This is considered a suitable mechanism to address the staging and timing of development with respect to future infrastructure upgrades to the transport network.

[2] https://www.nzta.govt.nz/resources/research/reports/422

Appendix A.
Detailed Movement Results for Key SH6 Intersections

Table 6.1 Turning Movement Performance at SH6 / McNulty by Scenario

			Exc Ind PC, Do Min			Exc Ind PC, RABs			Inc Ind PC, Do Min			Inc Ind PC, RABs		
Approach	Road	Movement	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
North	SH6	Left	184	2.3	A	187	2.9	A	197	2.3	A	200	3.0	A
		Thru	224	3.0	A	215	3.6	A	231	3.0	A	217	3.5	A
		Approach	408	2.7	A	402	3.3	A	428	2.7	A	417	3.2	A
East	McNulty	Left	70	28.9	D	74	2.9	A	59	46.9	E	69	3.1	A
		Right	292	50.0	E	313	3.1	A	302	68.1	F	339	3.2	A
		Approach	362	45.9	E	388	3.0	A	360	64.7	F	408	3.1	A
South	SH6	Thru	304	2.3	A	289	5.2	A	327	2.3	A	295	5.5	A
		Right	137	12.9	B	113	5.8	A	127	14.5	B	110	5.5	A
		Approach	441	5.6	A	402	5.3	A	454	5.7	A	405	5.5	A
		Intersection	1211	45.9	E	1192	3.9	A	1242	64.7	F	1230	4.0	A

Table 6.2 Turning Movement Performance at SH6 / Cemetery by Scenario

			Exc Ind PC, Do Min			Exc Ind PC, RABs			Inc Ind PC, Do Min			Inc Ind PC, RABs		
Approach	Road	Movement	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
North	SH6	Left	8	1.2	A	7	1.1	A	18	1.3	A	12	1.6	A
		Thru	273	2.2	A	271	2.1	A	261	2.3	A	259	2.3	A
		Approach	281	2.1	A	277	2.1	A	279	2.3	A	272	2.3	A
East	Cemetery	Left	66	4.8	A	62	5.4	A	72	5.2	A	64	4.0	A
		Right	40	11.6	B	21	12.8	B	65	17.6	C	35	14.5	B
		Approach	106	7.3	A	83	7.3	A	137	11.1	B	99	7.7	A
South	SH6	Thru	375	1.9	A	359	2.0	A	364	2.0	A	348	2.0	A
		Right	48	4.5	A	67	5.0	A	67	4.5	A	84	4.8	A
		Approach	423	2.2	A	426	2.4	A	430	2.4	A	432	2.5	A
		Intersection	810	7.3	A	786	7.3	A	846	11.1	B	802	7.7	A

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Industrial Rezoning for Industrial District Plan Chapter Review

Prepared for:	Central Otago District Council
Job Number:	CODC-J007
Revision:	Draft
Issue Date:	8 July 2021
Prepared by:	Jared White, Principal Transport Engineer
	Chris Blackmore, Senior Transportation Planner
Reviewed by:	Dave Smith, Technical Director

1. Overview

Central Otago District Council (CODC) commissioned Abley Limited (Abley) to provide transport planning advice regarding proposed industrial zoning changes on the outskirts of the existing McNulty industrial area to inform the industrial chapter in the District Plan review process. In mid-2020 Abley developed a microsimulation model of the Cromwell township using Paramics Discovery software, with the intention to support the implementation of the Cromwell Masterplan Spatial Framework (the Masterplan). The base model representing 2018 was developed, calibrated, and validated but the future year models were not established.

Any impacts on the wider transport network which result from the proposed rezoning need to be viewed in the context of the potential development provided for under the District Plan. To understand the extent of this potential development a future baseline scenario has been developed using growth forecasts reflecting Central Otago District's most recent growth projections. This includes the full build-out of existing industrial zoned land. An additional scenario is also developed containing the proposed zoning changes, with the model outputs analysed to establish the potential effects on the transport network. The area covering the proposed plan change development is shown within the dashed outline zones in **Figure 1.1**.

This technical note documents the assumptions used in setting up the future year baseline scenario and industrial plan change scenario and provides a summary of the transport network performance. Any infrastructure upgrade requirements are also noted.

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Figure 1.1 Proposed industrial Plan Change areas

2. Future Model Landuse Development

2.1 Growth Targets

The future landuse inputs for the model are consistent with the latest demographic forecasts from Central Otago District's 2020 growth projections. These forecasts were developed by Rationale Ltd in December 2020 and were supplied by CODC for this analysis. The agreed future year for this assessment is a long-term model representing the year 2050. The relevant demographic growth statistics are presented in **Table 2.1**.

The Lindis-Nevis Valleys growth area is only partially contained in the model area including Bannockburn, Pisa Moorings, and the agricultural areas between. Based on the 2018 census data it is estimated that 53% of households in the Lindis-Nevis Valleys are within the study area and the forecast future totals have been scaled back accordingly.

Additionally, Abley were provided with the Cromwell Masterplan report (prepared by Rationale in 2018) which has some detail around future growth in the area. Some guidance from this document is used, acknowledging that it has not been updated for the most recent (December 2020) growth forecasts.

Table 2.1 Demographic Forecast Summary from 2018 to 2050

Area	unit/year	2018	2050	Growth	2018 per Occ HH	2050 per Occ HH
Cromwell Township	Usually Resident Population	5780	8770	2990	2.68	2.58
	Number of Jobs	2890	6253	3363	1.34	1.84
	Total Dwellings	2736	4151	1415		
	Occupied Dwellings	2157	3405	1248		
Outer areas (53% of Lindis-Nevis Valleys)	Usually Resident Population	1304	2923	1620	2.36	2.23
	Number of Jobs	1060	1100	40	1.92	0.84
	Total Dwellings	709	1590	881		
	Occupied Dwellings	553	1309	755		
Cromwell and Valleys Combined	Usually Resident Population	7084	11693	4610	2.61	2.48
	Number of Jobs	3950	7353	3403	1.46	1.56
	Total Dwellings	3445	5741	2296		
	Occupied Dwellings	2710	4714	2003		

2.2 Residential Growth Apportionment

Residential growth is split between greenfield and infill, with estimates for each aspect obtained from the Cromwell masterplan. Given the scale of residential growth high yield rates of infill have been assumed. Lot size guidelines from the District Plan have been used to determine the scale of development in the Residential Resource Areas (RRA) and any committed developments such as the Wooing Tree masterplan.

The growth of total households in the sub areas along with the split in greenfield and infill is shown in **Table 2.2**. The masterplan documentation estimated the capacity of the Cromwell urban area for infill housing split into three areas, as shown in **Table 2.3**. There were no details of infill capacity in the outer areas however these are typically more rural in nature. The estimate of total dwelling capacity in various greenfield locations and RRAs calculated from average lot sizes, or as specified in the Cromwell masterplan, are shown in

Table 2.4.

Table 2.2 Subarea residential forecasts for total dwellings

Sub Area	Total Growth	Greenfield	Infill (Inferred)
Cromwell	1415	935	480
Valleys	881	270	611
Total	2296	1205	1091

Table 2.3 Cromwell Residential Infill Estimates

Area of Cromwell	Assuming Low Yield	Assuming High Yield	High Yield as occupied dwellings
East Cromwell	315	420	370
West Cromwell	270	360	318
North Cromwell	90	135	119
Total	675	915	598

Table 2.4 Greenfield Residential Dwelling Estimates

Growth Area	RRA and Specified total dwellings	as occupied dwellings
RR12	446	393
RR3	38	34
Wooing Tree Masterplan area	210	185
Top 10 holiday park	180	159
Gair Ave final stage	60	53
Bannockburn	140	120
Pisa Moorings	100	86
Lowburn	30	26

Once the greenfield dwellings were assigned there were 1091 dwellings remaining to be assigned to infill areas, with a higher proportion of this going to the outer areas (611 in the Valleys subarea from **Table 2.2**). In reviewing the outer areas and the Cromwell Masterplan it was decided the urban areas would absorb infill housing more readily. The higher rates of infill were assumed from **Table 2.3** for East and West Cromwell, with a lower rate assumed for the North Cromwell area.

2.3 Commercial Growth Apportionment

The revised methodology included increasing the commercial activity by 20% across the study area including the Town Centre. The currently zoned industrial areas south of McNulty Rd were analysed further as this is a key growth area with capacity to accommodate future development. The recently consented industrial subdivision in the east of the McNulty industrial area was included in this analysis as it would be expected to develop in line with existing industrial areas over the short to medium term.

Analysis of existing developed industrial areas informed the assumptions for new industrial areas under the future baseline and industrial plan change scenarios. This included calculating a total floor area from the total site area assuming 77% coverage once roads and reserves are established and then 20% site coverage of land with gross floor area (gfa). The Cromwell Masterplan identified the total areas of the industrial areas as follows in **Figure 2.1**.

A detailed study undertaken to check the coverage and utilisation rates within the existing McNulty industrial areas from aerial photography. The coverage was deemed appropriate however the utilisation ranged somewhat with a denser warehousing block having a utilisation of 38% but more typical areas ranging from 15% to 25%. The average utilisation ranged from 18% to 22% depending on the inclusion of the warehousing block, so a utilisation rate of 20% has been adopted in this analysis. The calibrated trip rate from the existing McNulty area was retained and applied to any infill available in the area, whereas the evening peak trip rate for the recently consented development (1.3 trips per 100m^2 GFA in peak hour) was used for development in new industrial areas including the proposed Plan Change development.

The total area of the McNulty Industrial area that can be utilised is calculated to be approximately 150,000m^2 GFA. Of the total available area approximately 111,600m^2 is existing and the consented site would take up 26,700m^2.

To make this area fully utilised for the Baseline Scenario the existing floorspace and trip making activity is scaled by 1.105. The breakdown of utilised land and associated trip generation of the industrial areas is shown in **Table 2.5**.

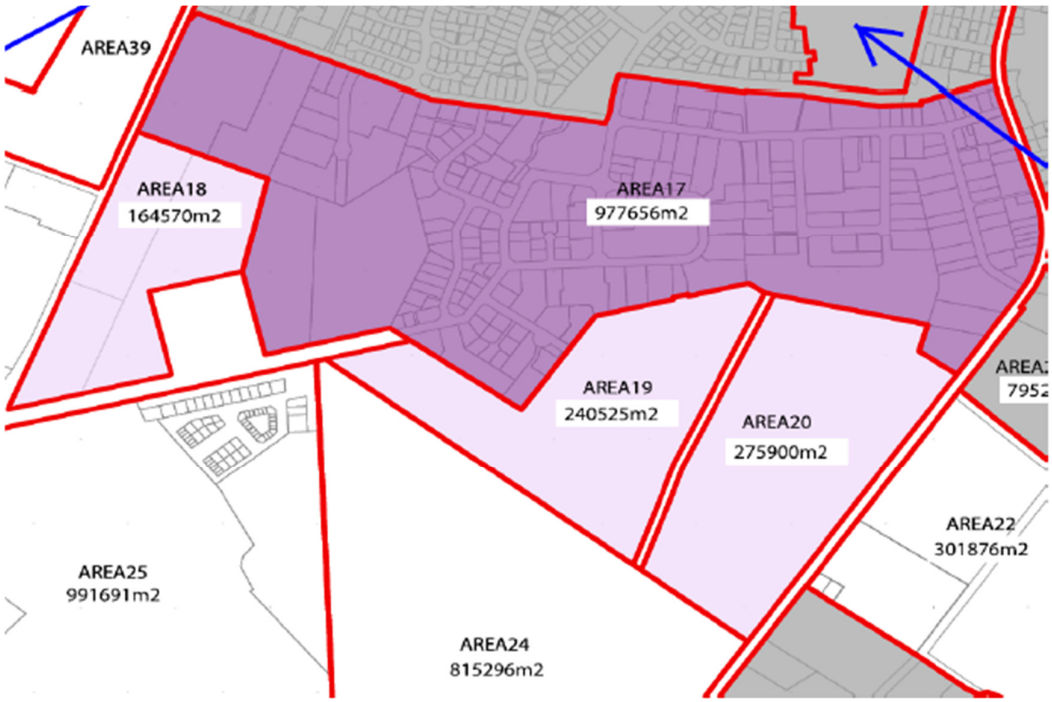

Figure 2.1 General scale of Industrial areas and Plan Change site

Table 2.5 Existing and Proposed Industrial Building areas

Industrial Area	Raw Area	Site Coverage (77%)	Utilisation (20%)	PM peak hour trips	PM 2 hour total
Existing 2018 McNulty	978,000	n/a	111,600	1,515	2,714
Recent Consented Area	174,000	134,000	26,700	347	622
Total 2050 Baseline	978,000		150,100	2,022	3,621
Area 20 (Z303)	276,000	212,000	42,350	551	986
Area 19 (Z303)	241,000	185,000	36,900	480	860
Area 18 (Z305)	165,000	126,000	25,300	328	588

To obtain the two-hour demand the peak hour demand is scaled by 1.791, as per the base model. The overall interpeak activity from the industrial areas has been derived by comparing the base model total volumes in the two-hour evening peak period to the five-hour interpeak period, resulting in a scaling factor of 1.597 to get from evening peak demand to interpeak demand.

2.4 External Zone Traffic Volume Growth

The most recent Average Annual Daily Traffic (AADT) volumes for the four roads representing the external connections of the model were obtained from Waka Kotahi (WK), covering the five years from 2016 to 2020. There was a noticeable drop in the 2020 count values potentially due to effects from Covid-19 travel restrictions. The average growth across all sites from 2016 to 2019 was 4.35% annually which aligned with the population growth of Cromwell in the 2016 and 2017 years as shown in the Cromwell Masterplan report.

Given the traffic growth rate is generally in line with population growth the external volumes have been increased by the forecast growth in population of the modelled area. This is equal to 65% more traffic in 2050 when compared to 2018.

3. Future Year Network

3.1 Baseline Network

The initial road network set up for the 2050 future year was generally in line with the 2018 base network. A key infrastructure input is a new single lane roundabout at the SH6 and SH8B intersection which has been coded in line with the layout proposed for NZUP[1]. The 2018 network was simplified when it was set up with many intersections with single lane approaches. The future network operation was observed for performance issues that were related to this, with additional capacity added where there is existing space for vehicles to pass another that is waiting to turn. This was not a response to provide additional capacity over what is already provided but to better match the existing intersection layouts.

The main additional network detail in the currently industrial zones area was new roading connections between McNulty Road and Cemetery Road, in line with the previous modelling undertaken for CODC by Abley.

3.2 Network with Proposed Industrial Plan Changes

There are presently no details on what the road network would look like within the proposed industrial plan changes, and this would normally be presented as part of an Outline Development Plan (ODP). However, the likely main roads that would serve these large areas have been assumed for this testing stage. The western site of Area 18 has been connected via the recently consented site and via Cemetery Road on the west side of the cemetery. For the two south-eastern sites a new road has been assumed on the south-western boundary of both sites between Bannockburn Road and Cemetery Road. Another link has been assumed to run off this new road between the two sites, connecting them both into the existing area via the western side of Ree Cresent. The industrial area network including the proposed Plan Change sites is shown in **Figure 3.1**.

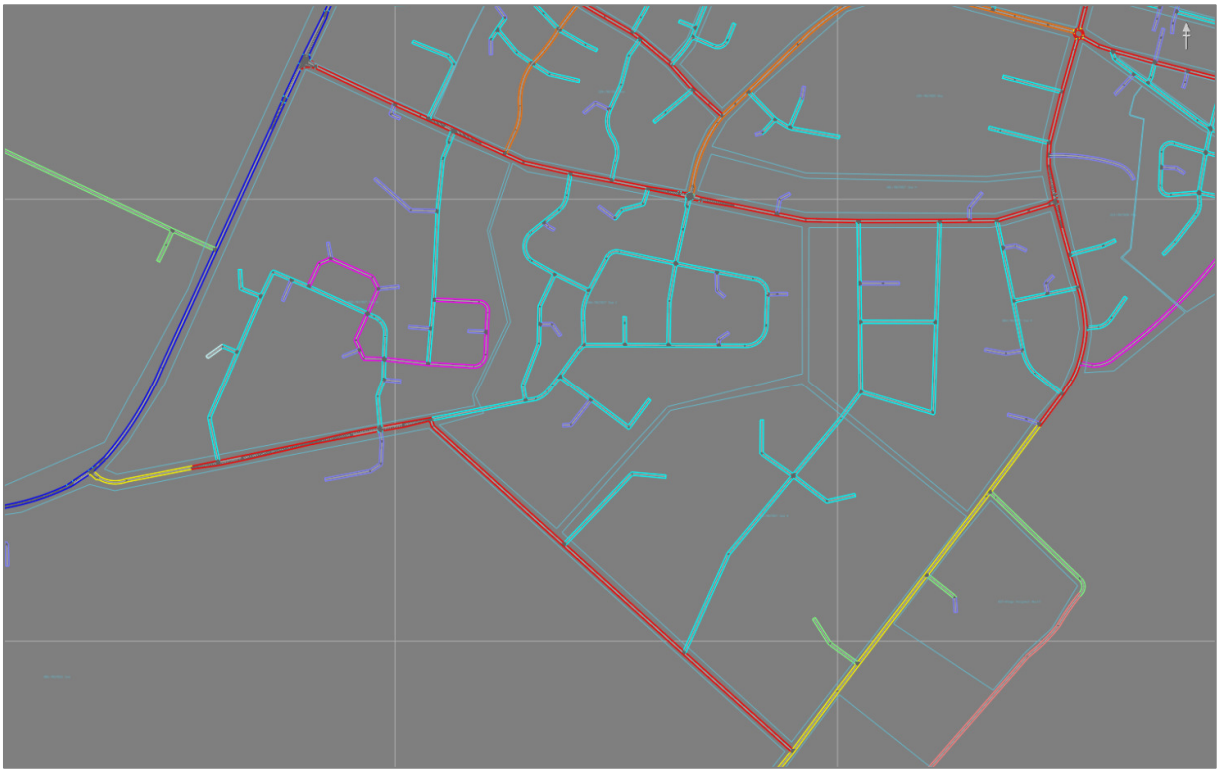

Figure 3.1 Future road network with industrial plan change areas

[1] https://www.nzta.govt.nz/projects/sh6-sh8b-cromwell-intersection-improvements/

4. Future Model Operation Comparison

4.1 Intersection Performance

The performance of key intersections has been summarised in Table 4.1 for the 2050 interpeak hour and Table 4.2 for the 2050 evening peak hour. The results include the total traffic movements per hour through the intersection, average intersection delay for delayed vehicles (in seconds) and Level of Service. Level of Service (LoS) is a function of delay and is a concept used by transportation engineers to qualitatively describe network performance as shown in the classifications below:

Level of Service Band	General Traffic Flow Description
LoS A	Primarily free-flow operation
LoS B	Reasonably unimpeded operation
LoS C	Stable operation
LoS D	A less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed
LoS E	Characterised by unstable operation and significant delay
LoS F	Characterised by flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay

These results show good performance in the interpeak hour in both the baseline and when including the industrial zoning plan changes. Changes in intersection delay are low and level of service is mostly very good, with no intersection exceeding LOS B in either scenario.

The evening peak periods are much busier than the interpeak which is consistent with the 2018 base model and there are some notable changes described following the tables.

Table 4.1 2050 future year Interpeak Hour intersection performance comparison

Intersection	2050 Baseline PM Peak			2050 IPC PM Peak			Change	
	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay
SH6 / Pisa Moorings Rd / Clark Rd	732	5.1	A	741	4.9	A	9	-0.2
SH6 / Lowburn Valley Rd	839	6.3	A	848	6.3	A	9	0
SH6 / Burn Cottage Rd	857	1.8	A	864	2	A	7	0.2
SH6 / Shortcut Rd	874	2.3	A	885	2.4	A	11	0.1
SH6 / SH8b	1410	7	A	1505	7.8	A	95	0.8
SH6 / Ripponburn	855	3.1	A	971	3	A	116	-0.1
SH6 / Ripponvale Rd	836	3.8	A	955	4.2	A	119	0.4
SH6 / McNulty Rd	1147	10.3	B	1257	11.2	B	110	0.9
SH6 / Ord Rd	914	5.2	A	1033	7	A	119	1.8
SH6 / Cemetery Rd	881	6.6	A	1076	10.1	B	195	3.5
SH6 / Sandflat Rd	427	6.2	A	419	6.3	A	-8	0.1
SH6 / Pearson Rd / Ripponvale Rd	394	5.2	A	395	5.4	A	1	0.2
SH8b / Sargood Rd	977	4.8	A	992	4.7	A	15	-0.1
SH8b / Barry Ave	1026	5.3	A	1077	5.8	A	51	0.5
SH8b / Shortcut Rd	664	8.5	A	675	9.3	A	11	0.8
SH8b / Bell Ave	540	6.9	A	553	7.7	A	13	0.8
SH8b / Alpha St	729	8.9	A	719	8.2	A	-10	-0.7
SH8 / SH8b	888	5.1	A	887	5.4	A	-1	0.3
Barry Ave / Inniscort St / Gair Ave	893	3.7	A	1116	4.5	A	223	0.8
Barry Ave / McNulty Rd	623	3.9	A	773	5.1	A	150	1.2

Table 4.2 2050 future year Evening Peak Hour intersection performance comparison

Intersection	2050 Baseline PM Peak			2050 IPC PM Peak			Change	
	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay
SH6 / Pisa Moorings Rd / Clark Rd	1025	7.1	A	1035	6.9	A	10	0
SH6 / Lowburn Valley Rd	1187	7.9	A	1190	9.9	A	3	2
SH6 / Burn Cottage Rd	1198	2.4	A	1197	2.2	A	0	0
SH6 / Shortcut Rd	1231	2.6	A	1231	2.6	A	0	0
SH6 / SH8b	1836	18.5	B	1930	37.1	D	94	19
SH6 / Ripponburn	1071	4.2	A	1194	5.4	A	124	1
SH6 / Ripponvale Rd	1048	4.8	A	1173	5.3	A	125	0
SH6 / McNulty Rd	1471	45.1	E	1591	142	F	120	97
SH6 / Ord Rd	1116	7	A	1297	14.3	B	181	7
SH6 / Cemetery Rd	1084	9.9	A	1356	143.5	F	272	134
SH6 / Sandflat Rd	469	8.4	A	449	9.2	A	-20	1
SH6 / Pearson Rd / Riponvale Rd	434	5.6	A	424	5.5	A	-10	0
SH8b / Sargood Rd	1348	17.7	C	1373	21.4	C	25	4
SH8b / Barry Ave	1319	33.9	D	1364	34	D	46	0
SH8b / Shortcut Rd	738	35.9	E	756	51.8	F	18	16
SH8b / Bell Ave	568	7.9	A	573	7.6	A	4	0
SH8b / Alpha St	874	43.3	E	857	33.7	D	-17	-10
SH8 / SH8b	1160	10.3	B	1137	9.7	A	-23	-1
Barry Ave / Inniscort St / Gair Ave	1274	10.6	B	1546	25.1	C	272	15
Barry Ave / McNulty Rd	799	11.4	B	1029	63.6	F	230	52

Key observations are:

- The proposed roundabout at the intersection of SH6 /SH8B operates acceptably in both scenarios (LOS B – D) as a single circulating lane. There is provision in the plans for a second circulating lane that would provide increased capacity and potentially provide a more attractive route via the State Highway network compared to through town via Barry Ave. If the State Highway network is more attractive, operation of the congested right turns from Cemetery and McNulty will need to be carefully considered.
- The town centre experiences significant congestion in the evening peak hour irrespective of the industrial rezoning. This is mainly due to limited capacity at Waenga/Sargood and Barry/Waenga restricting the southbound flow and then blocking back, introducing a large amount of side-road congestion. Delays at SH8B/Sargood and SH8B/Barry are acceptable (LOS C – D), however there are instances of turns into the Town Centre blocking back close to the State Highway and introducing delays to the through movements on SH8B.

The most notable changes resulting from the inclusion of the industrial rezoning are:

- SH6/Cemetery is significantly more attractive to industry in the south, increasing by ~240 vehicles in peak hour.
  - The majority of these are on the right turn out of Cemetery, with ~50 vehicles rerouting from SH6/McNulty.
  - Overall delays are significant, at LOS F.
- SH6/McNulty turning volumes from McNulty reduce slightly, mostly from the right turn onto SH6.

  - Even with this decrease in turning volumes delays increase significantly to LOS F, indicating the intersection is operating over capacity.
- Traffic from the industrial rezoning areas increase northbound volumes through Bannockburn significantly, by around 250-300 vehicles in peak hour.
  - This northbound increase impacts the operation of Barry/McNulty (LOS F) and the Barry/Gair/Inniscort roundabout (LOS C), and increases traffic from existing industrial areas routing via Gair, Jollys and Waenga in preference to using Barry/McNulty.
  - McNulty is less attractive overall, as egresses at both ends of the road are significantly more congested than the baseline.
  - New accesses have been assumed to connect the plan change areas and link Bannockburn Rd, Cemetery Rd and Ree Cr. These carry around 350 vehicles at the Cemetery Rd end, 400 vehicles at the Bannockburn Rd end, and 370 vehicles at the Ree Cr connection in peak hour.
  - Without this connection capacity is likely to be exceeded on McNulty and Bannockburn Rd and is likely to cause significant deterioration of surrounding intersections as traffic is forced to reroute.
- The highest traffic volumes occur on Barry Rd to the south of Gair (around 1000 vehicles in peak hour) and on SH8B between Barry and Shortcut (950-1000 vehicles in peak hour).

The pattern of traffic volume change can be seen in **Figure 4.1** for the evening peak hour.

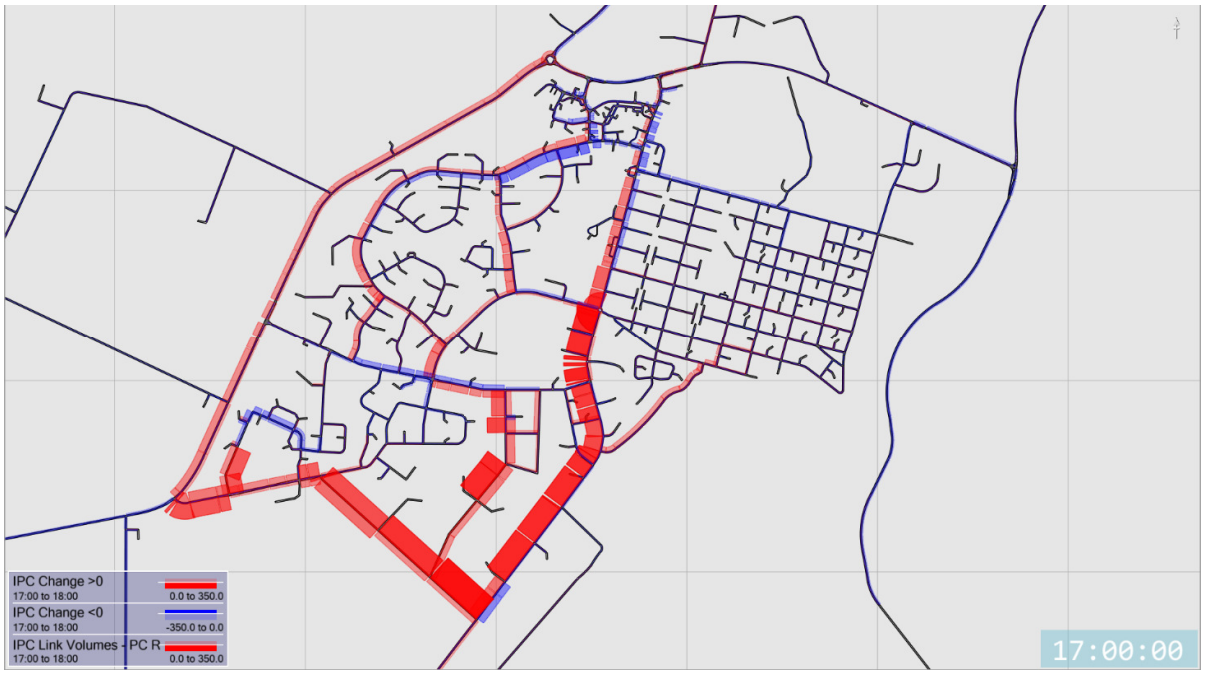

Figure 4.1 Evening Peak Hour Volumes Change with Plan Changes implemented

5. Conclusions

The transportation modelling has provided guidance as to the likely effects on the Cromwell road network due to the proposed industrial rezoning. It is concluded that:

- Upgrades are likely to be required at the SH6 intersections at McNulty Road and Cemetery Road.
  - A roundabout is likely to form the most suitable upgrade of the SH6 / McNulty Road intersection and may meet the performance threshold for requirement in the baseline scenario.
  - Cemetery Road could require a lesser upgrade (such as a formalised Seagull right-turn treatment) if a roundabout at the McNulty intersection is installed.
  - Further assessment and engagement with Waka Kotahi will be required to confirm the most suitable form for these intersections.
- An upgrade of the Barry Ave / McNulty Rd intersection will likely be required as a result of the rezoning and a roundabout is likely to be the most suitable intersection form.
- Consideration of a management and access plan for the SH8B corridor however this is likely required irrespective of the proposed industrial rezoning. This includes the Barry Ave and Shortcut Rd intersections which could potentially be resolved with the implementation of the roundabout associated with the Wooing Tree masterplan. As with changes to McNulty Rd, this would require further analysis to quantify the change to vehicle routing behaviour and confirm the most suitable for of these intersections.
- It has been highlighted in the report that the town centre has issues with pinch points and resulting congestion at the ring roads such as at Waenga Dr, Barry Ave, Murray Tce and Sargood St. This is recommended to be addressed through future Masterplan work and is required irrespective of the industrial rezoning.

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Sensitivity: General

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27 May 2022

Attention: Richard Shaw

Dear Richard,

Cromwell plan change transport advice

Beca has been engaged to review the modelling and transport assessment completed by Abley Limited (Abley) and the Waka Kotahi submission on the Plan Change 18 Cromwell Industrial extension proposed by Central Otago District Council (CODC). This letter highlights the findings and recommendations of our review.

Reviewed documents:

- Industrial rezoning for industrial district plan chapter review (draft) – by Abley 8 July 2021
- Submission on Plan Change 18 – Cromwell Industrial Extension – by Waka Kotahi 9 December 2021
- SH6/SH8B Intersection Upgrade – Traffic Modelling Assessment – by WSP 30 September 2020

To identify the potential safety impacts of the plan change on the SH6 corridor, we have completed a gap analysis of the documents provided and a Safety System Assessment (SSA) on various access intersections forms.

1 Findings – recommendations

Overall, we find that there is insufficient information in the Abley report. What there is indicates that the model may not realistically capture the likely effects of the proposed plan change on the state highway network and additional information is required. We will also need the additional information to complete an SSA on the potential effects.

We suggest Waka Kotahi request additional information from Abley and CODC relating to:

Any assumptions made on the quantity and location of residential trip ends for the predicted employment/population growth resulting from the industrial zone. It appears the model currently assumes the additional population will live entirely within Cromwell township.

Any allowance made to account for traffic to and from the new industrial area via the state highways. There are several aspects of the Abley model that appear to discourage traffic associated with the new industrial areas from using the state highway network, especially the SH6/Cemetery Road and SH6/McNulty Road intersections.

Whether the baseline network model accounts for future changes or upgrades at the SH6/SH8B intersection. These changes will likely be triggered by the baseline future traffic volume predicted by the model.
Assumptions made around the Harvest Road layout in the model. It appears Harvest Road will be connected to Cemetery Road in the near future.
Whether the loading of areas 19 and 20 trips is appropriate.
Whether the level of detail and quantity of intersection report is adequate, considering that

- Routing of the modelled network will be affected by performance of internal intersections. The model reporting is restricted to two internal intersections and the state highway intersections.
- A single number is provided, each for intersection volume and delays. More information will be required for the key SH intersections to determine impact of the new industrial zones.

We also have the following preliminary comments on the Abley report conclusions
A seagull right-turn treatment is not a desirable safety upgrade and treatment in most cases.
The current layout and alignment of the Cemetery Road and SH6 intersection elevates the likelihood of crashes related to or due to turning movements. As the traffic volume of the side road increases, the likelihood and exposure to these crashes increase.
Considering the air strip and the new petrol station adjacent to the McNulty Road and SH6 intersection. A new roundabout in this location will likely require land acquisition and encounter space challenges.

2 Gap analysis

2.1 Abley draft review report

This section highlights key information from the Abley report and our queries which may need to be clarified by Abley and CODC to allow for a more robust assessment.

2.1.1 Future model land use development

a. Employment growth

Forecast growth in jobs is higher than the growth in population (86% cf. 65%). With the growth in external trips pegged to the increase in population, this implies that all of these “extra” workers will live within the model extents, leading to proportionally more of the population working in 2050 than in 2018 (63% of residents working in 2050, compared with 56% currently).

Employment associated with the new industrial areas would be on top of these existing job forecasts, implying that the increase in employment with the proposed rezoning would be higher than the baseline 86%. There is no information in the report identifying where the people working in these jobs would live (and therefore commute to and from).

b. Trips outside Cromwell township

With the proposed rezoning there is no change in traffic volumes on the state highway network outside Cromwell itself – **Table 1** summarises the change in total volume through the intersections on the periphery of the township.

Table 1: Change in total intersection volumes with Plan Changes (vehicles)

Location	Interpeak Hour	Evening Peak Hour
SH6 to west (SH6 / Pearson Rd / Ripponvale Rd)	+1	-10
SH6 to north (SH6 / Burn Cottage Rd)	+7	0
SH8B to east (SH8 / SH8b)	-1	-23

With little or no change in these traffic volumes, especially in the evening peak hour, this implies that no staff in the new industrial areas live outside Cromwell township itself e.g. in areas to the north of Cromwell like Lowburn and Pisa Mooring, or further afield.

It also implies that there is little or no growth in commercial trips (e.g. trucks) on the state highway network outside Cromwell associated with these new industrial areas.

As there are assumed to be 1,359 additional vehicle trips in the evening peak hour[1] (and 3,887 in the interpeak period) generated by the new industrial areas, it seems very unlikely that the proposed plan change would not result in an increase in traffic on the state highway network outside Cromwell township itself.

2.1.2 Future year network

a. Baseline Network

The 2050 baseline network includes a single lane roundabout at the SH6/SH8B intersection, replacing the existing priority-T intersection (construction is currently underway on the roundabout). With the forecast increase in traffic volumes in 2050, a single lane roundabout may well be approaching capacity, creating a bottleneck for state highway traffic (which would lead to modelled traffic avoiding the state highway to bypass the roundabout). The small increase in traffic volumes at the roundabout with the new industrial areas (+94 vehicles in the evening peak hour) doubles the average delay (from 19 to 37 seconds), indicating that operation of the roundabout is becoming unstable, likely as it nears capacity.

The roundabout has been designed so it can be upgrade to two lanes. A traffic modelling assessment of the roundabout undertaken by WSP for Waka Kotahi indicated that an appropriate “trigger” for two-laning the roundabout was a doubling of traffic volumes from the 830 vehicles in the evening peak hour in 2019. With a reported 1,836 vehicles in the evening peak hour in the baseline, the trigger volume would have already been reached.

This suggests that the SH6/SH8B roundabout should be modelled with two lanes in the 2050 baseline network.

b. Harvest Road

Modelled future network assumes no direct connection between McNulty Road and Cemetery Road. Aerials show Harvest Road being connected through to Cemetery Road, which may provide a direct (and therefore more attractive) route from the new industrial areas to McNulty Road (see **Figure 1**). Even though the crescent encircling the cemetery in Area 18 is connected to Harvest Road, it is not clear what restrictions apply e.g. may be banned to “non-familiar” vehicles.

Flow difference plot for evening peak hour shows no or little change in traffic on Harvest Road, and large changes on either side of where cemetery crescent physically joins Cemetery Road.

[1] Table 2.5, Industrial Rezoning for Industrial District Plan Chapter Review, Abley.

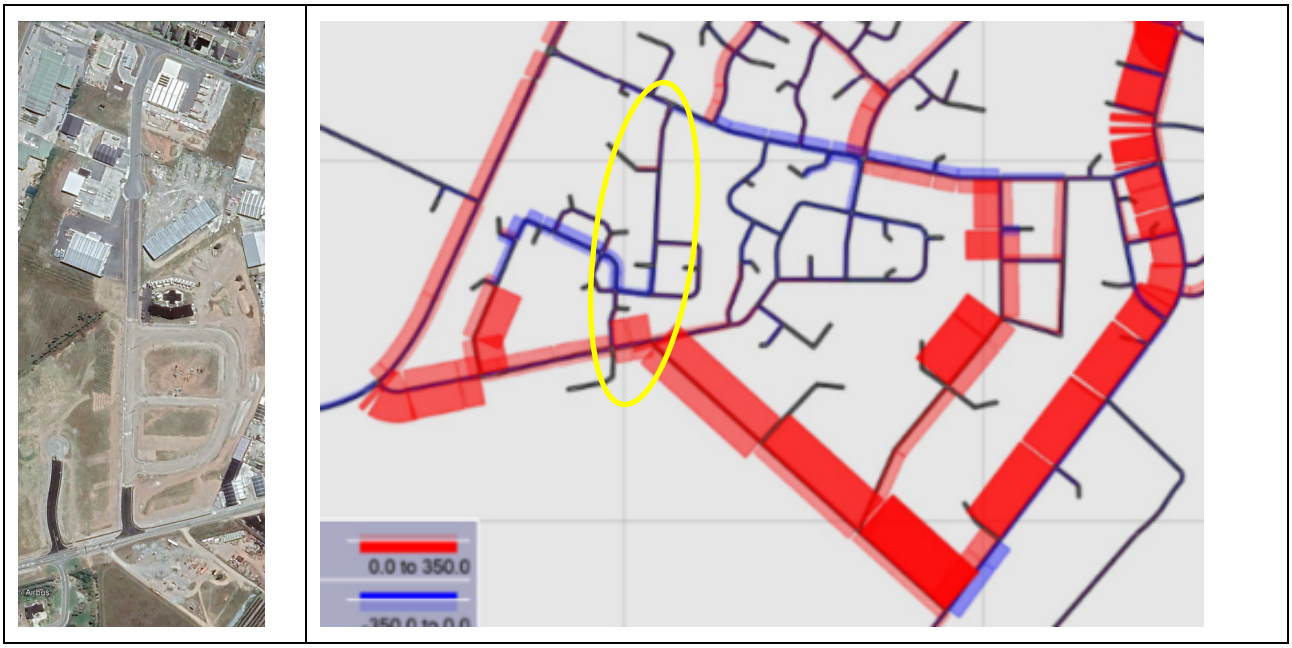

Figure 1

There is the potential that the modelled connectivity and layout of Harvest Road may restrict traffic from travelling between the new industrial areas and McNulty Road, and therefore keeping them away from turning at the McNulty Road/SH6 intersection (although the increase in delay to 2½ minutes in the evening peak hour probably also has an effect).

c. Areas 19 and 20 Loading

Trips to and from industrial areas 19 and 20 are loaded from a single zone (Z303), which may allow too much latitude in terms of which roads these new trips are loaded on to.

2.1.3 Future model operation comparison

Reporting of intersection performance is restricted primarily to state highway intersections, with only two "internal" intersections reported (Barry Avenue with McNulty Road and with Gair Avenue/Inniscort Street). Routing through the modelled road network will be affected by the performance of these internal intersections.

The reporting of effects also aggregates information, with intersection volumes and delays each aggregated to a single number. For the more important state highway intersections (SH6/Cemetery Road, SH6/McNulty Road and SH6/SH8B), we would need more information on the delays and volumes on each of the individual approaches to determine the impact of the new industrial zones.

2.1.4 Conclusions

There are several aspects of the Abley model that appear to discourage traffic associated with the new industrial areas from using the state highway network, especially the SH6/Cemetery Road and SH6/McNulty Road intersections. The modelling report does not provide enough information to be satisfied that the model realistically captures the likely effects of the proposed plan change on the state highway network, nor does it report all the information required to make a proper assessment of the modelled effects on the state highway network.

2.2 Waka Kotahi submission

3 Safe System Assessment

3.1 Scenarios

We propose completing SSA on a range of scenarios below to assess different intersection formation and outcomes.

- Scenario 1 – Base case (Existing) 100km/h
- Scenario 2 – Future base existing 80km/h
- Scenario 3 – Abley Recommendation – Roundabout at McNulty Road and Seagull Right turn treatment at Cemetery Road
- Scenario 4 – Two roundabouts at McNulty Road and Cemetery Road intersections
- Scenario 5 – Roundabout at Cemetery Road and Rural Intersection Advance Warning (RIAWs), or Left in / Left Out (LILO) at McNulty Road

3.2 Recommendation

Additional information from Abley (breakdown of future AADT at the SH intersections) will be required to complete Safe System Assessment of the scenarios proposed above.

Yours sincerely

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on behalf of

Beca Limited

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Industrial Rezoning Modelling for Industrial District Plan Chapter – 2034 Future Year

Prepared for	Central Otago District Council
Job Number	CODC-J007
Revision	2nd Draft
Issue Date	26 October 2022
Prepared by	Chris Blackmore, Senior Transportation Planner
Reviewed by	Jared White, Principal Transport Engineer Dave Smith, Technical Director

1. Overview

1.1 Summary of previous undertaking

Central Otago District Council (CODC) commissioned Abley Limited (Abley) to provide transport planning advice regarding proposed industrial plan changes on the outskirts of the existing McNulty industrial area to inform the industrial chapter in the District Plan review process. In mid-2020 Abley developed a microsimulation model of the Town of Cromwell using Paramics Discovery software, with the intention to support the implementation of the Cromwell Masterplan Spatial Framework (the Masterplan). The base model representing 2018 was developed, calibrated, and validated but the future year models were not established at that time.

Any impacts on the wider transport network which result from the proposed rezoning need to be viewed in the context of the potential development provided for under the District Plan. To understand the extent of this potential development a future baseline scenario has been developed using growth forecasts reflecting Central Otago District's most current growth projections. An additional scenario is also developed containing the proposed zoning changes, with the model outputs analysed to establish the potential effects on the transport network. The area covering the proposed plan change development is shown within the dashed outline zones in Figure 1.1.

Following a draft of the report a further scenario was developed which included only two of the three proposed areas in the Industrial Plan Change which are the two areas south of the existing McNulty industrial area near Bannockburn Road. Analysis and outputs from the 2050 model year examined in this scenario were provided to CODC in the technical note dated 27 July 2021.

1.2 Model update and 2034-year future model development

Due to significant uncertainty around growth projections due to ongoing impacts from the Covid-19 pandemic, CODC have commissioned annual growth projection updates to be prepared by Rationale. CODC has supplied the latest 2022 projection update, published by Rationale in April 2022, to be utilised in this model update. This update also creates an interim future year to provide insight into potential timing requirements for any infrastructure upgrades which may be required for the network to function efficiently. This year was selected as 2034 to align with the growth projections.

This technical note documents the assumptions used in setting up the 2034 future year Industrial Plan Change and Excluding Plan Change scenarios and provides a brief summary of the transport network performance. Concept level testing was also undertaken to quantify the potential impact of intersection upgrades on McNulty Road, especially the intersection of McNulty Road and SH6.

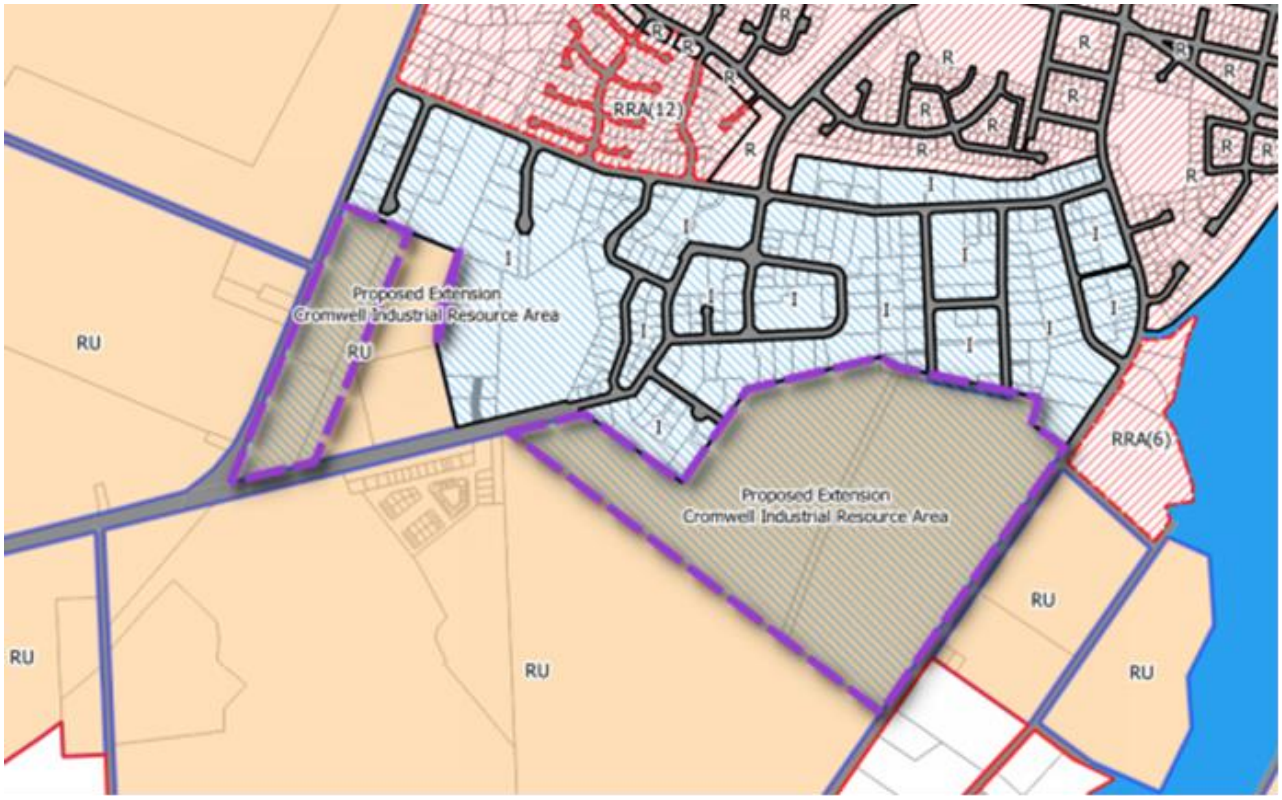

Figure 1.1 Proposed industrial Plan Change areas

2. Future Model Landuse Development

2.1 Growth Targets

The agreed landuse inputs for the future model development are the latest demographic forecasts reflecting Central Otago District's 2022 growth projections. These forecasts were developed by Rationale Ltd and were provided by CODC for this analysis. The agreed future year is a medium-term model representing the year 2034. The relevant demographic growth statistics are presented in Table 2.1.

The Lindis- Nevis Valleys growth area is only partially contained in the model area as is comprised of the mainly agricultural areas excluding the townships of Cromwell, Bannockburn, and Pisa Moorings. The 2018 model occupied household value has been used to apportion the growth that occurs within the model, of the occupied households in the Lindis- Nevis Valleys 53% are found in the modelled area so 53% of the area growth has been used.

Additionally, Abley were provided with the Cromwell Masterplan report (prepared by Rationale in 2018) which has some detail around future growth in the area. Some guidance from this document is used, acknowledging that it has not been updated for the latest 2022 growth forecasts.

Table 2.1 Demographic Forecast Summary from 2018 to 2034, total Cromwell Ward

Area	unit/year	2018	2034	Growth	2018 per HH	2034 per HH
Cromwell Township	Usually Resident Population	5,780	8,977	2,990	2.13	2.14
	Total Ratings Units	3,004	4,668	1,664		
	Total Dwellings	2,736	4,202	1,466		
Bannockburn Township	Usually Resident Population	500	986	486	1.98	2.20
	Total Ratings Units	276	511	235		
	Total Dwellings	252	449	197		
Pisa Moorings Township	Usually Resident Population	590	1481	891	1.91	2.25
	Total Ratings Units	345	776	431		
	Total Dwellings	309	657	348		
Lindis-Nevis Valleys (only 53% within model)	Usually Resident Population	1,390	2,758	1,368	1.79	1.92
	Total Ratings Units	885	1,623	738		
	Total Dwellings	777	1,435	658		
Cromwell Ward Total	Usually Resident Population	8,310	14,202	5,892	2.04	2.11
	Total Ratings Units	4,510	7,578	3,068		
	Total Dwellings	4,074	6,743	2,669		

2.2 Residential Growth Apportionment

The total dwelling growth was used in the residential growth apportionment and then area specific occupied dwelling rates were applied informed by the growth targets. In the 2018 Census the urban Cromwell area has an occupied dwelling proportion of 88.2%, whereas the Lindis-Nevis Valleys has a proportion of 85.7% and these occupancy rates have been carried forward to the 2034 future year.

Residential growth is initially apportioned to the known greenfield sites with total demand taken from the 2022 growth projections. Given the scale of residential growth the projected household demands exceeds the currently zoned residential area available. To apportion the remaining residential demand potential future residential greenfield and medium-density residential areas were identified by CODC. Lot size guidelines from the District Plan have been used to determine the scale of development in these areas, with a minimum lot size of 200m2 assumed for medium-density development. It was assumed that currently zoned greenfield areas would be developed fully before future sites, the remaining demand was then apportioned pro-rata over the remaining future capacity.

The growth of total households in the sub areas along with the split in current greenfield and future development is shown in Table 2.2. The estimate of total dwelling capacity and uptake to 2034 in greenfield locations, RRAs, and potential medium density developments calculated from average lot sizes are shown in Table 2.3.

Table 2.2 Subarea residential forecasts for total dwellings

Sub Area	2034 Total Growth	Greenfield (Current)	Remaining Growth	Future Greenfield and MDR Estimate	Uptake of Future Cap to 2034
Cromwell	1,466	1,218	248	565	338
Bannockburn	197	140	57	60	58
Pisa Moorings	348	100	248	360	280
Lindis-Nevis Valleys	349	166	183	61	61
Total	2,360	1,624	736	1,046	736

Table 2.3 Greenfield Residential Dwelling Capacity Estimates and total uptake

Growth Area	Greenfield Cap (Current)	Future Greenfield and MDR Estimate Cap	Total Uptake
RR12, including additional anticipated medium density	446	303	626
RR3	38	0	38
Ripponvale PC14 development	136	0	136
Wooing Tree Masterplan area	219	0	219
Top 10 holiday park development	180	0	180
Gair Ave / Olds Cres development	267	0	267
Freeway Orchard development	0	263	157
River Terrace and Highlands	68	0	68
Bannockburn	140	0	140
Domain Rd, Bannockburn	0	60	58
Pisa Moorings, including additional anticipated medium density	100	360	380
Lowburn	30	61	91
Total	1,624	1,046	2,360

Once the current greenfield dwellings were assigned there were 736 dwelling remaining to be assigned to future development areas. Assigning the remaining anticipated growth from each subarea projection resulted in an excess of 122 dwellings in the Lindis-Nevis Valley. This demand was reapportioned to the other subareas pro-rata over the remaining capacity in each area, resulting in an additional 90 dwellings in Cromwell, 32 dwellings in Pisa Moorings, and 1 dwelling in Bannockburn. It should be noted that if additional infill and greenfield development was proposed in the Lindis-Nevis Valley it would be expected to reduce the pro-rata apportionment.

2.3 Commercial Growth Apportionment

Town Centre Commercial and Existing Industrial

The revised 2050 methodology included increasing the commercial activity by 20% across the study area including the Town Centre. This growth was factored to match the expected employment growth in the revised 2034 forecasts for Cromwell township. Where previous grow from 2018 to 2050 was 3,363 jobs, the revised Cromwell growth forecasts from 2018 to 2034 is 1,601 jobs resulting in a factor of 48% of expected 2050 growth. This corresponds to a Town Centre growth of 9.6% from 2018 to 2034.

Rural Industrial and Agricultural

Rural employment growth is significantly high in the revised 2034 projections compared to the previous 2050 projections. For this reason, rural growth has been factored by the projected increase in employment between 2018 and 2034. The revised growth is 1,865 jobs, from 2,000 in 2018 to 3,865 in 2034, a growth factor of 93%. For comparison the previous 2050 growth in rural employment was 76 jobs, a growth factor of 3.8%.

McNulty Industrial Area and Industrial Plan Change Area

The industrial areas south of McNulty Rd were analysed further as this is a key growth area with capacity to accommodate future development. The recently consented industrial subdivision in the east of the McNulty industrial area (covering Harvest Rd, Cemetery Rd, and Old Saleyards Rd) was included in this analysis as it would be expected to develop in line with existing industrial areas over the short to medium term.

The recent consented development analysis with the model was used to inform the analysis of the future baseline and scenario with the industrial plan changes. This included calculating a total floor area from the total site area assuming 77% coverage once roads and other areas are established and the 30% utilisation of land in buildings. The Cromwell Masterplan identified the total areas of the industrial areas as follows in Figure 2.1 and the industrial plan change considered covers Area 19 and Area 20.

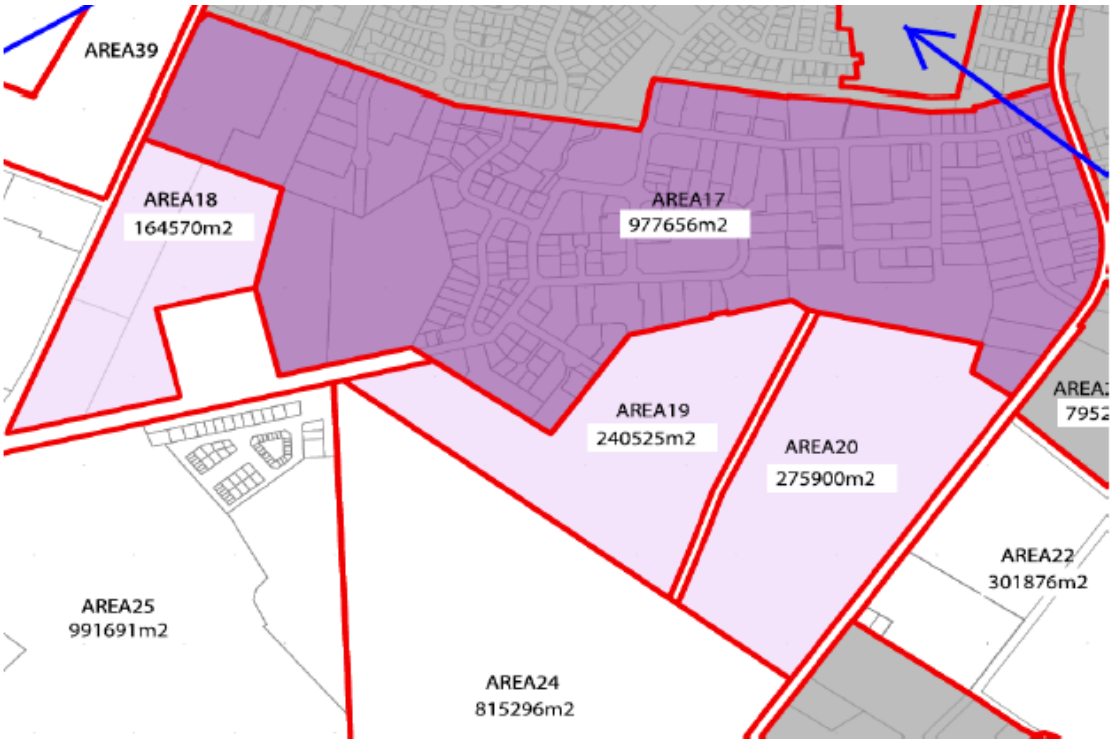

Figure 2.1 General scale of Industrial areas and Plan Change site, note only the western portion of Area 18 is included

A detailed study undertaken to check the coverage and utilisation rates within the existing McNulty industrial areas from aerial photography. The coverage was deemed appropriate however the utilisation ranged somewhat with a denser warehousing block having a utilisation of 38% but more typical areas ranging from 15% to 25%. The average utilisation ranged from 18% to 22% depending on the inclusion of the warehousing block, so a utilisation rate of 20% has been adopted in this analysis. The calibrated trip rate from the existing McNulty area was retained and applied to any infill available in the area, whereas the evening peak hour rate for the recently consented development (1.3trips per 100m2 GFA) was used for development in new industrial areas including the proposed Plan Change development.

The total area of the McNulty Industrial area that can be utilised is calculated to be approximately 150,000m2 GFA. Of the total available area approximately 111,600 is existing and the consented site would take up 26,700m2.

To make this area fully utilised for the Baseline Scenario the existing floorspace and trip making activity is scaled by 1.105. The breakdown of utilised land and associated trip generation of the industrial areas is shown in Table 2.4.

Table 2.4 Existing and Proposed Industrial Building areas, 2050 future year

Industrial Area	Raw Area	Site Coverage (77%)	Utilisation (20%)	PM peak hour trips	PM 2 hour total
Existing 2018 McNulty	978,000	n/a	111,600	1,515	2,714
Recent Consented Area	174,000	134,000	26,700	347	622
Total 2050 Baseline	978,000		150,100	2,022	3,621
PC Area 20 (Z303)	276,000	212,000	42,350	551	986
PC Area 19 (Z303)	241,000	185,000	36,900	480	860

Industrial Area	Raw Area	Site Coverage (77%)	Utilisation (20%)	PM peak hour trips	PM 2 hour total
PC Area 18 (Z314)	93,000			**	**

To obtain the two-hour demand the peak hour demand is scaled by 1.791, as per the base model. The overall interpeak activity from the industrial areas has been derived by comparing the base model total volumes in the two-hour evening peak period to the five-hour interpeak period, resulting in a scaling factor of 1.597 to get from evening peak demand to interpeak demand.

As with the Town Centre 2034-year job growth, the industrial growth for the 2034 year was factored in line with the overall growth of employment in Cromwell. The total two-hour, two-way trips in Area 19 and Area 20 (1,846 trips in 2050) were factored by 48% to give the equivalent growth to 2034. This assumes that the Plan Changes areas will develop at the same rate as remaining industrial areas and any additional infill within the existing industrial zoning.

After the 2050 future year model development, Area 18 was partially notified as part of Plan Change 19. To calculate the trip generation in the 2034 future year the area covered by Area 18 was estimated as 93,000sqm and trips were reapportioned from the total calculated for Area 19 and Area 20. The total trips assigned to each Plan Change Area for the 2034 future year are as in Table 2.5.

Table 2.5 Plan Change 19 Trip Generation, 2034 future year

Industrial Area	Raw Area	PM peak hour trips	PM 2 hour total
PC Area 20	276,000	234	420
PC Area 19	241,000	204	366
PC Area 18 (partial)	93,000	76	137

2.4 Excluding Plan Change Scenario Landuse

The 2022 growth projections are predicated on a suitable amount of land capacity to meet the employment expectations in the sub-area. This means that the baseline landuse developed with these projections includes area for industrial expansion implicitly, and for this reason it was decided to modify an 'excluding industrial expansion' scenario to test the potential impacts of not providing Area 19 and Area 20 for industrial use.

The following high-level assumptions were used to reallocate the trips generated by Area 19 and Area 20:

1. An increase in utilisation of existing industrial area would be assumed, 50% of the trip total has been reallocated to existing industrial activity along McNulty Rd.
2. Some industrial activity would relocate to nearby areas, 25% of the trip total has been reallocated to the Wanaka and Alexandra external connections which represents an increase in interaction between Cromwell residents and external employment.
3. Some industrial activity either leaves the area completely (i.e. completely self-contained within another area) or does not occur, the balance of 25% of trips were not reallocated which represents these trips being either fully external to the area or not being undertaken in the first place.

The trip allocation assumptions result in an increase in vehicle travel along both SH6 northbound and SH8 southbound, as well as increasing vehicle travel along McNulty Rd. This has impacts on McNulty Rd intersections as noted in Section 4.

2.5 External Zone Traffic Volume Growth

The most recent Average Annual Daily Traffic (AADT) volumes for the four roads representing the external connections of the model were obtained from Waka Kotahi, covering the ten years from 2012 to 2022. There was a noticeable drop in the 2020 count values due to effects from Covid19 travel restrictions. The average growth across all sites from 2016 to 2019 was 4.35% annually which aligned with the population growth of Cromwell in the 2016 and 2017 years as shown in the Cromwell Masterplan report.

The development of the 2034 future year has coincided with an update of the Queenstown Lakes District Strategic Transportation Model, which includes a high-level representation of Cromwell. This model has been used to inform changes on SH6 to the south-west (Kawarau Gorge) and north-west (towards Wanaka) external connections, and account for changes in wider landuse interactions between Cromwell and the wider Queenstown Lakes district. The growth rates for each external connection are shown in Table 2.6 for the interpeak and evening peak periods.

Table 2.6 External volume growth 2018 – 2034 by period

External Connection	Interpeak Growth 2018 - 2034	PM Peak Growth 2018 - 2034
SH8 Southeast	24%	39%
SH8 Northeast	1%	4%
SH6 Northwest	113%	87%
SH6 Southwest	11%	10%

3. Future Year Network

3.1 Baseline Network

The initial road network set up for the 2034 future year was generally in line with the 2018 base network. A key infrastructure input is a new single lane roundabout at the SH6 and SH8B intersection which has been coded in line with the layout constructed under NZUP[1]. Also included is the newly constructed roundabout at the SH8B and Barry Ave intersection, including the northern leg which forms the main access to the Wooing Tree development. The area surrounding the SH6 and SH8B intersection is shown in Figure 3.1.

Figure 3.1 Modelled Network near SH6 and SH8B intersection

The 2018 network was simplified when it was set up with many intersections with single lane approaches. The future network operation was observed for performance issues that were related to this, with additional capacity added where there is existing space for vehicles to pass another that is waiting to turn. This was not a response to provide additional capacity over what is already provided but to better match the existing intersection layouts.

The main additional network detail in the consented industrial subdivision was new network constructed extending Harvest Road to connect McNulty Road and Cemetery Road.

[1] https://www.nzta.govt.nz/projects/sh6-sh8b-cromwell-intersection-improvements/

3.2 Network with Proposed Industrial Plan Changes

There are presently no details on what the road network would look like within the proposed industrial plan changes, this would normally be presented as part of an Outline Development Plan (ODP). However, the likely main roads that would serve these large areas have been assumed for this testing stage. For the two south-eastern sites a new road has been assumed on the south-western boundary of both sites between Bannockburn Road and Cemetery Road. Another link has been assumed to run off this new road between the two sites, connecting them both into the existing area via the western side of Ree Crescent. The industrial area network including the proposed Plan Change sites is shown in Figure 3.2.

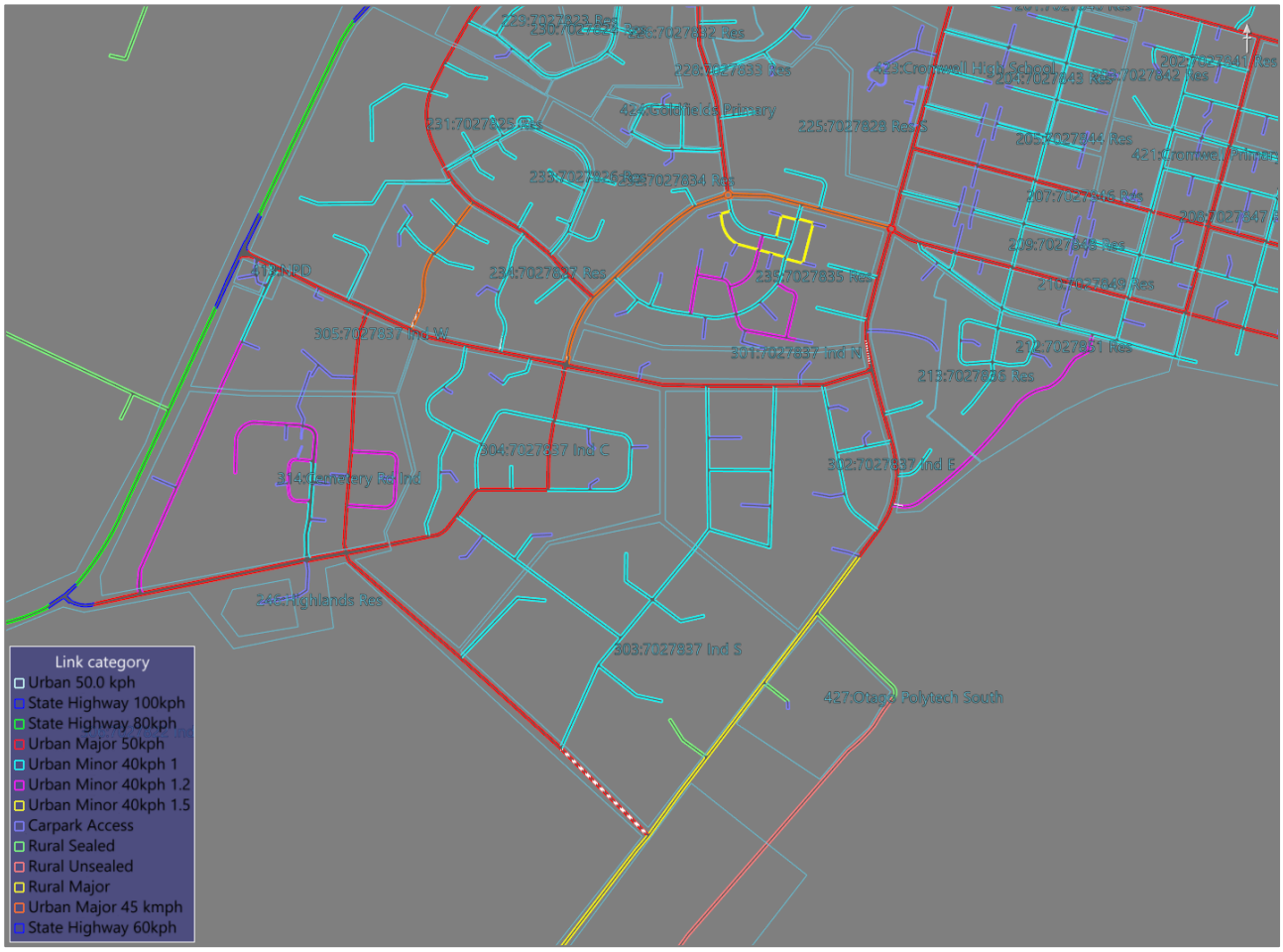

Figure 3.2 Modelled Network near industrial plan changes

3.3 McNulty Road Upgrade Options

The capacity of intersections along McNulty Road has been noted by CODC as a significant bottleneck, especially the intersection of McNulty Road and SH6. The current intersection configuration is a priority T intersection, with McNulty Rd as the minor leg. There is a short, painted acceleration lane northbound, however it is not clear what proportion of vehicles utilise the additional space.

The do minimum scenario includes safer speed zones (shown in blue in Figure 3.2) for the SH6 intersections at both Cemetery Rd and McNulty Rd. The option scenario replaces the McNulty Rd and SH6 intersection with an appropriately sized single-lane roundabout. The priority crossroads at the McNulty Rd and Gair Ave intersection is also replaced with a single-lane roundabout as significant

queueing was observed there during initial testing of the base network in the 2034 future year model. The option network on McNulty Rd is shown in Figure 3.3.

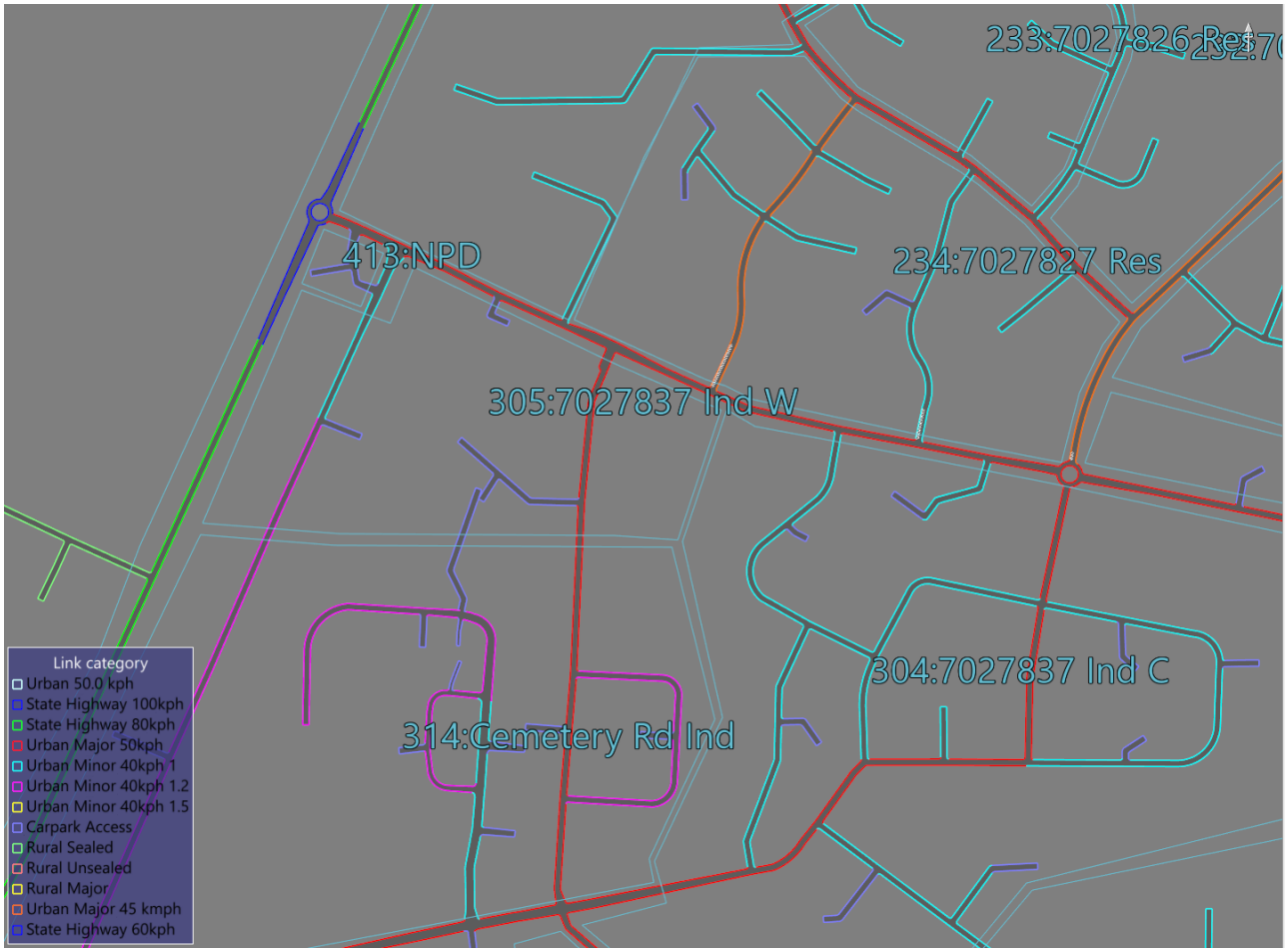

Figure 3.3 Modelled option network on McNulty Road, alterations circled in red

4. Future Model Operation Comparison

4.1 Interpeak Model Performance

Results show good performance in the interpeak hour in both with and without the proposed industrial plan changes. Changes in intersection delay are low and level of service is mostly very good, with no intersection exceeding LOS B in any scenario. For this reason, the following result summaries focus on the evening peak hour.

4.2 Intersection Performance Excluding Industrial PC Areas

The performance of key intersections has been summarised in Table 4.1 for the 2034 evening peak hour. These results cover the baseline scenario, being the projected 2034 landuse excluding the industrial plan changes and without infrastructure upgrades on McNulty Rd.

The evening peak periods are much busier than the interpeak period, which is reflective of the 2018 base model, and there are several intersections which experience degraded performance, most notably:

- SH6 / McNulty Rd operates at a LOS E for the McNulty Rd approach, indicating that this intersection is operating close to the practical capacity of the intersection. This is likely to result in degraded intersection performance, with long queues and more variables delays experienced by vehicles accessing SH6.
- McNulty Rd / Gair Ave priority crossroads operates at LOS F for the southern Gair Ave approach, indicating that this intersection is operating in excess of the practical capacity of the intersection. In practice, this will often result in an increase in rat-running as vehicles attempt to bypass the congested intersection. It can also result in drivers selecting smaller gaps than during normal operation, potentially leading to an increase in safety issues.
- Several intersections around the town centre are operating at LOS C, including the roundabout at SH6 / SH8B. This is generally acceptable in peak hour and is not indicative of performance issues.

Table 4.1 2034 Baseline Scenario Evening Peak Hour intersection performance

Intersection	Baseline - 2034 exc Plan Changes, Do Minimum		
	Volume	Delay (s)	LOS
SH6 / Pisa Moorings Rd / Clark Rd	1330	11.5	B
SH6 / Lowburn Valley Rd	1471	13.0	B
SH6 / Burn Cottage Rd	1471	3.2	A
SH6 / Shortcut Rd	1492	2.2	A
SH6 / SH8b	1971	24.6	C
SH6 / Ripponburn	1095	5.9	A
SH6 / Ripponvale Rd	1097	20.2	C
SH6 / McNulty Rd	1211	45.9	E
SH6 / Ord Rd	711	5.7	A
SH6 / Cemetery Rd	810	7.3	A
SH6 / Sandflat Rd	403	6.0	A
SH6 / Pearson Rd / Ripponvale Rd	324	5.3	A
SH8b / Sargood Rd	1355	27.5	D
SH8b / Barry Ave	1221	11.0	B
SH8b / Shortcut Rd	631	23.8	C
SH8b / Bell Ave	527	6.1	A
SH8b / Alpha St	857	13.8	B
SH8 / SH8b	997	5.7	A
Sargood / Iles St	1124	19.4	C
Barry Ave / Waenga Dr	1293	9.2	A

Intersection	Baseline - 2034 exc Plan Changes, Do Minimum		
Barry Ave / Neplusultra St	1263	22.6	C
Barry Ave / Molyneaux Ave	1124	17.9	C
Barry Ave / Inniscort St / Gair Ave	1156	4.9	A
Gair Ave / Jollys Rd	280	4.8	A
McNulty Rd / Gair Ave	794	75.6	F
Barry Ave / McNulty Rd	751	10.4	B

The pattern of traffic volumes around the township can be seen in Figure 4.1 for the evening peak hour.

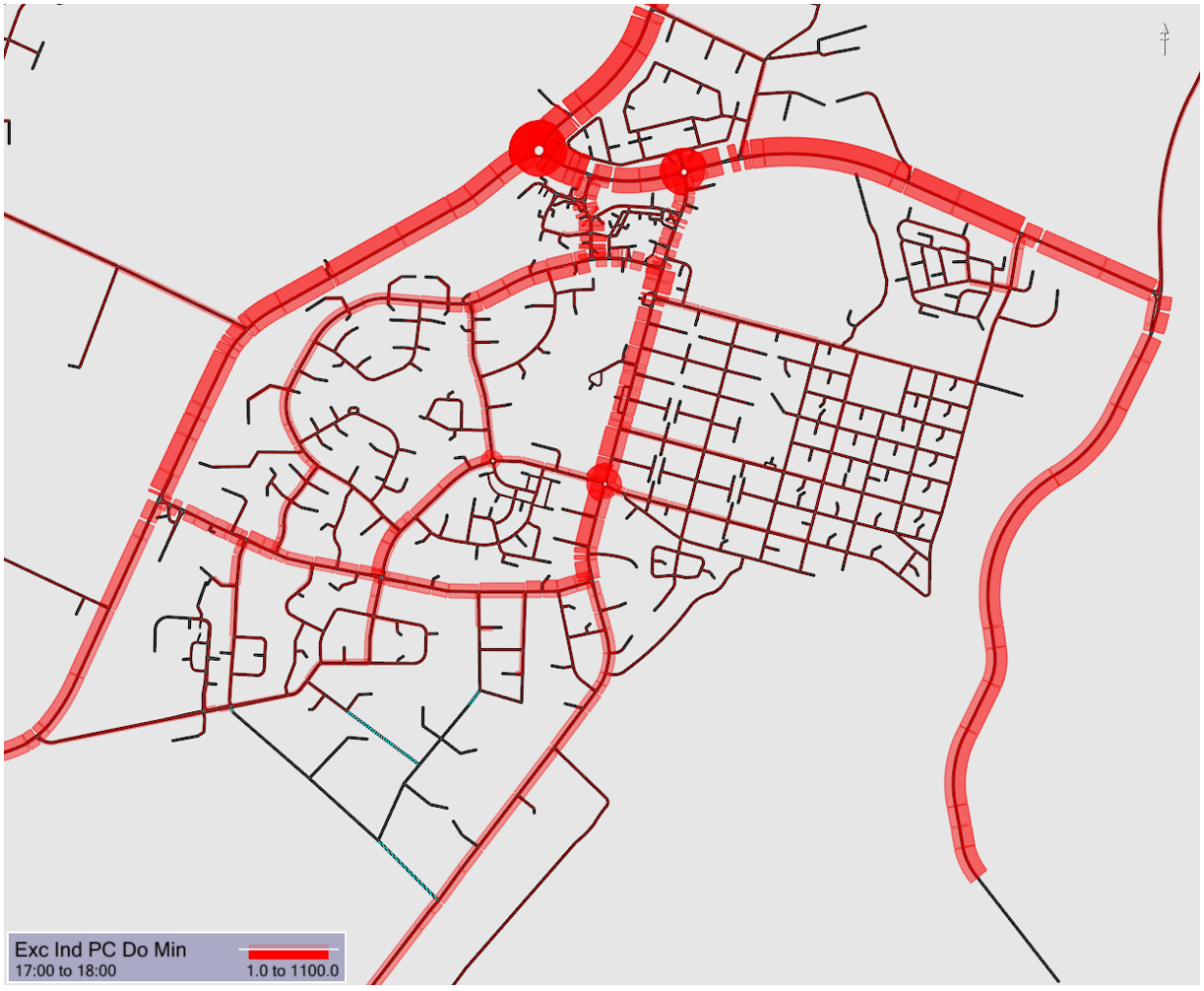

Figure 4.1 Evening Peak Hour Volumes for 2034 Baseline scenario

The 2034 future year model sees significant growth around the township compared to the 2018 base model. The change in volume in the evening peak period between 2018 and 2034 is shown in Figure 4.2, noting that this comparison has been made over the updated 2034 do minimum network.

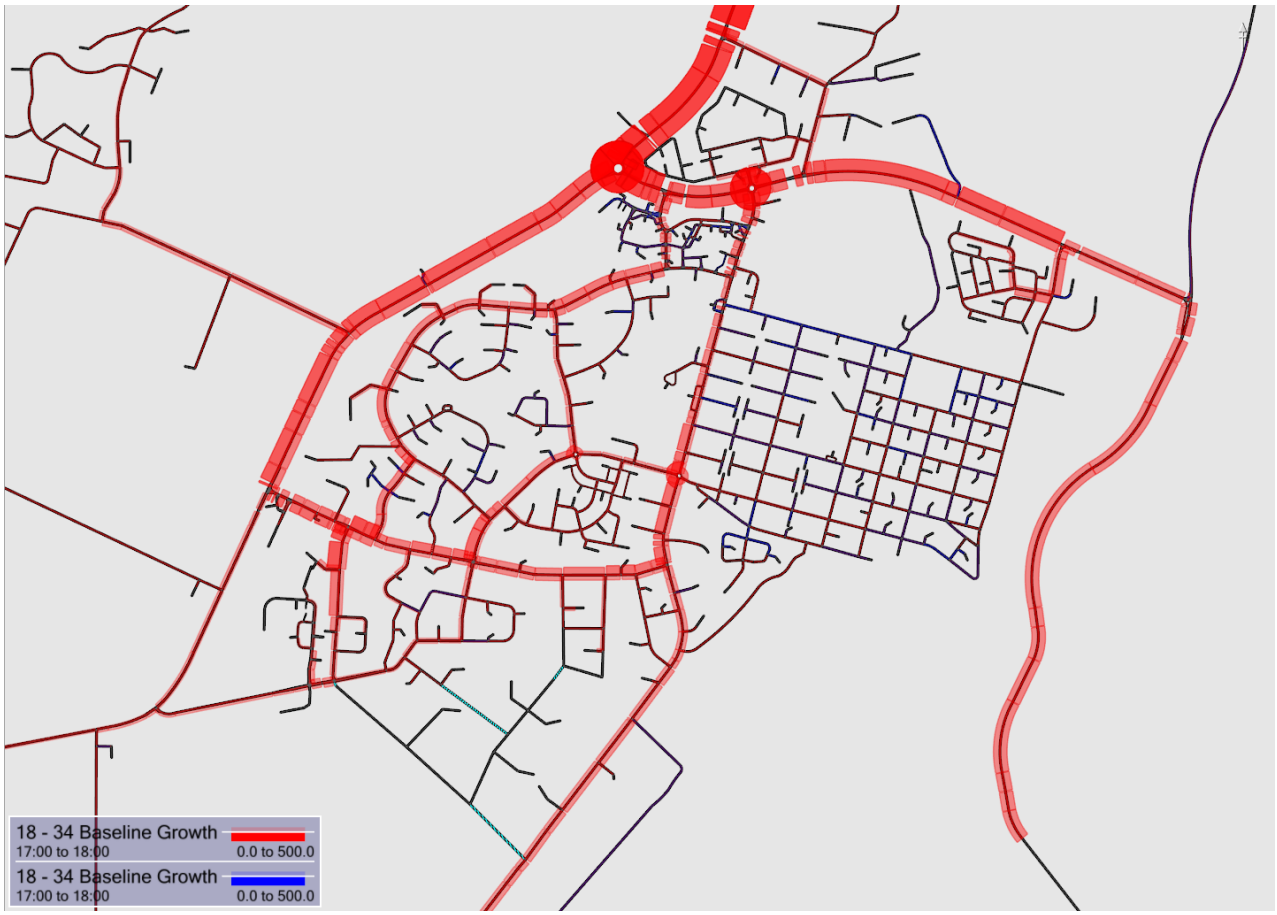

Figure 4.2 Evening Peak Hour Volume Change, 2018 to 2034, on 2034 do minimum network

4.3 Intersection Performance Including Industrial PC Areas

The performance of key intersections has been summarised in Table 4.2 for the 2034 evening peak hour. These results cover the option landuse scenario, being the projected 2034 landuse including the industrial plan changes and without infrastructure upgrades on McNulty Rd.

Key changes in intersection and network performance with the inclusion of the Area 19 and Area 20 industrial areas are as follows:

- The largest impact on the network performance comes from the addition of the plan change access road, which creates a direct link with Harvest Rd between McNulty Rd and Bannockburn Rd. This removes vehicle trips from McNulty east of Harvest Rd, which in turn improves intersection performance for the eastern minor road approaches to McNulty Rd. The McNulty Rd / Gair Ave intersections operates much more efficiently compared to the baseline scenario, improving to LOS D on the worst performing approach.
- The SH6 / McNulty Rd intersection is clearly operating in excess of capacity, and an increase in vehicle trips is not able to be accommodated on the McNulty Rd approach.
- There is a small increase in volumes on Cemetery Rd, however the intersection still operates well within capacity limits.

Table 4.2 2034 Including Plan Change Scenario Evening Peak Hour intersection performance comparison

Intersection	2034 Including Plan Change, Do Min			Change from Baseline	
	Volume	Delay	LOS	Volume	Delay
SH6 / Pisa Moorings Rd / Clark Rd	1299	9.3	A	-31	-2.1
SH6 / Lowburn Valley Rd	1445	14.4	B	-26	1.4
SH6 / Burn Cottage Rd	1444	2.8	A	-26	-0.4
SH6 / Shortcut Rd	1467	2.2	A	-26	0.0
SH6 / SH8b	1977	19.3	B	6	-5.3
SH6 / Ripponburn	1144	6.1	A	49	0.2
SH6 / Ripponvale Rd	1147	28.1	D	50	7.9
SH6 / McNulty Rd	1242	64.7	F	31	18.8
SH6 / Ord Rd	724	6.1	A	14	0.3
SH6 / Cemetery Rd	846	11.1	B	37	3.7
SH6 / Sandflat Rd	390	6.7	A	-13	0.7
SH6 / Pearson Rd / Ripponvale Rd	319	5.3	A	-6	0.0
SH8b / Sargood Rd	1315	24.5	C	-40	-3.0
SH8b / Barry Ave	1180	11.0	B	-42	0.0
SH8b / Shortcut Rd	591	23.6	C	-40	-0.2
SH8b / Bell Ave	498	6.7	A	-29	0.5
SH8b / Alpha St	825	14.2	B	-32	0.5
SH8 / SH8b	947	5.0	A	-50	-0.8
Sargood / Iles St	1105	17.7	C	-19	-1.7
Barry Ave / Waenga Dr	1280	9.4	A	-14	0.2
Barry Ave / Neplusultra St	1257	22.6	C	-6	0.0
Barry Ave / Molyneaux Ave	1143	15.9	C	20	-2.0
Barry Ave / Inniscort St / Gair Ave	1200	5.3	A	44	0.3
Gair Ave / Jollys Rd	281	4.7	A	1	-0.1
McNulty Rd / Gair Ave	748	26.2	D	-45	-49.4
Barry Ave / McNulty Rd	676	9.3	A	-75	-1.1

The change in traffic patterns as a result of the industrial plan changes is shown in Figure 4.3.

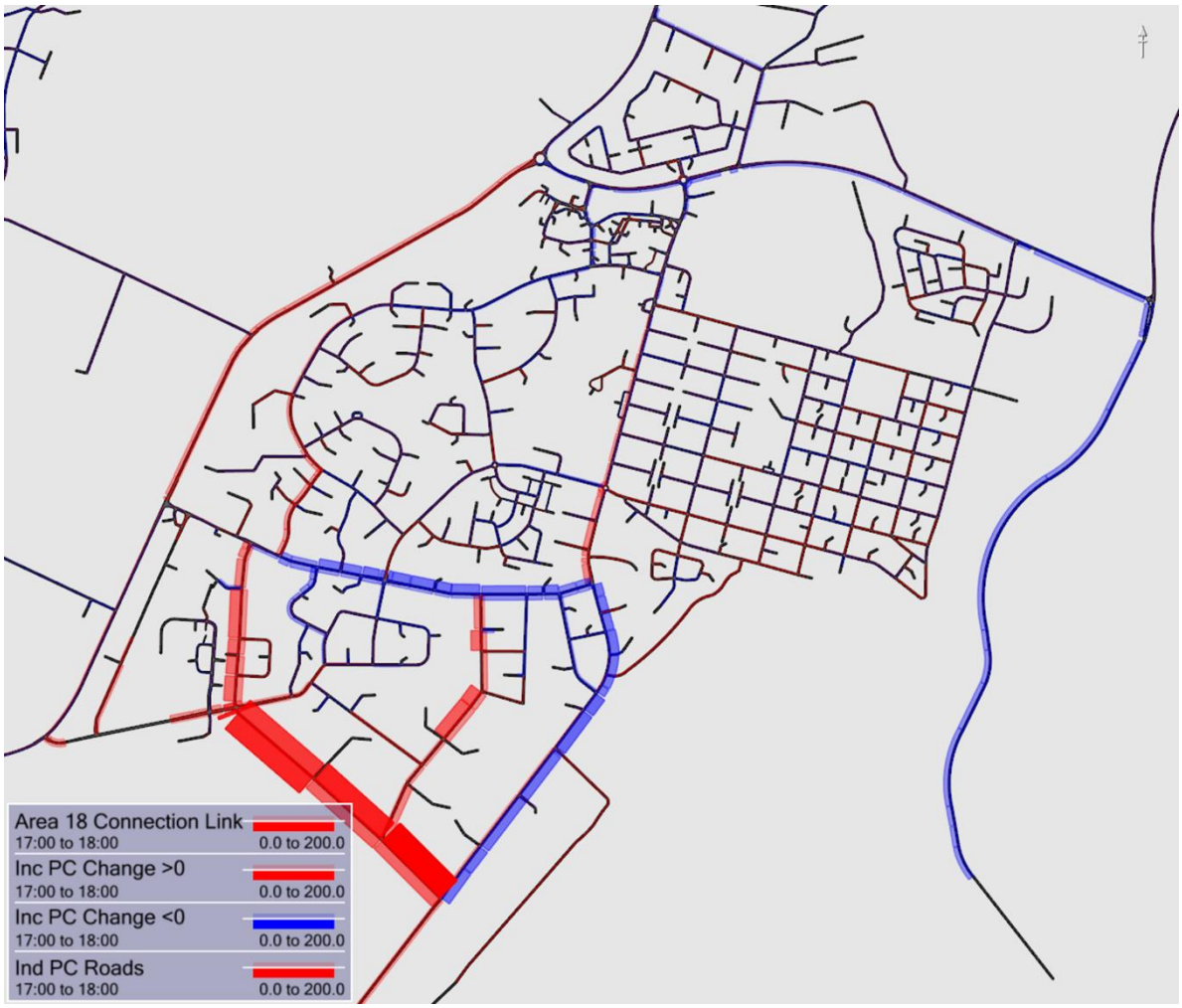

Figure 4.3 Evening Peak Hour Volume Change including Industrial Plan Change

4.4 Intersection Performance with McNulty Rd Upgrades

Testing of the landuse scenarios in Section 4.2 and 4.3 demonstrates that the key intersections experiencing congestion and capacity constraints are the priority intersections at SH6 / McNulty Rd and McNulty Rd / Gair Ave.

The do-minimum infrastructure at SH6 / McNulty Rd already includes a safer speed zone and formalisation of the seagull arrangement for the right turn, so the next logical progression is to an appropriately sized roundabout.

Due to the context of major intersections surrounding the McNulty Rd / Gair Ave, as well as safety considerations, a roundabout was considered the most appropriate infrastructure upgrade at that location also. It should be noted that these intersection arrangements have been tested at a high-level concept design stage only, and further refinement would be expected at the detailed design stage to ensure the geometry and lane configuration is appropriate for expected heavy vehicle volumes as well as other vulnerable road users.

Including single-lane roundabouts at the intersections of SH6 / McNulty Rd and McNulty Rd / Gair Ave provides significant increases in capacity, improving intersection to LOS A in both cases. This reduces rat-running of vehicles turning right at Cemetery Rd, as well as reducing vehicles rat-running via Pinot

Noir Dr to avoid queueing at Gair Ave. This represents a network operating far more efficiently than the do-minimum scenarios.

The performance of key intersections has been summarised in Table 4.3 for the 2034 evening peak hour. These results cover the baseline scenario, being the projected 2034 landuse including the industrial plan changes and infrastructure upgrades on McNulty Rd.

Table 4.3 2034 Including Plan Change and McNulty RABs Scenario Evening Peak Hour intersection performance comparison

Intersection	2034 including Plan Change, RABs			Change from including PC, Do-Min	
	Volume	Delay	LOS	Volume	Delay
SH6 / Pisa Moorings Rd / Clark Rd	1288	10.1	B	-11	0.8
SH6 / Lowburn Valley Rd	1436	16.3	C	-9	1.9
SH6 / Burn Cottage Rd	1439	3.5	A	-6	0.7
SH6 / Shortcut Rd	1461	2.3	A	-6	0.1
SH6 / SH8b	1972	21.7	C	-5	2.3
SH6 / Ripponburn	1144	6.4	A	0	0.3
SH6 / Ripponvale Rd	1140	26.9	D	-7	-1.1
SH6 / McNulty Rd	1230	4.0	A	-12	-60.7
SH6 / Ord Rd	673	5.5	A	-51	-0.5
SH6 / Cemetery Rd	802	7.7	A	-44	-3.4
SH6 / Sandflat Rd	378	6.5	A	-12	-0.2
SH6 / Pearson Rd / Ripponvale Rd	314	5.1	A	-5	-0.1
SH8b / Sargood Rd	1307	23.3	C	-8	-1.3
SH8b / Barry Ave	1170	11.0	B	-10	0.0
SH8b / Shortcut Rd	588	21.5	C	-3	-2.1
SH8b / Bell Ave	491	4.5	A	-7	-2.1
SH8b / Alpha St	820	14.8	B	-5	0.6
SH8 / SH8b	939	5.5	A	-9	0.5
Sargood / Iles St	1090	15.5	C	-15	-2.2
Barry Ave / Waenga Dr	1277	9.1	A	-3	-0.3
Barry Ave / Neplusultra St	1253	31.2	D	-5	8.6
Barry Ave / Molyneaux Ave	1141	17.7	C	-3	1.8
Barry Ave / Inniscort St / Gair Ave	1164	5.9	A	-36	0.6
Gair Ave / Jollys Rd	275	5.1	A	-6	0.4
McNulty Rd / Gair Ave	768	4.1	A	20	-22.1
Barry Ave / McNulty Rd	688	7.5	A	12	-1.8

The change in traffic patterns as a result of the McNulty Rd upgrades is shown in Figure 4.4.

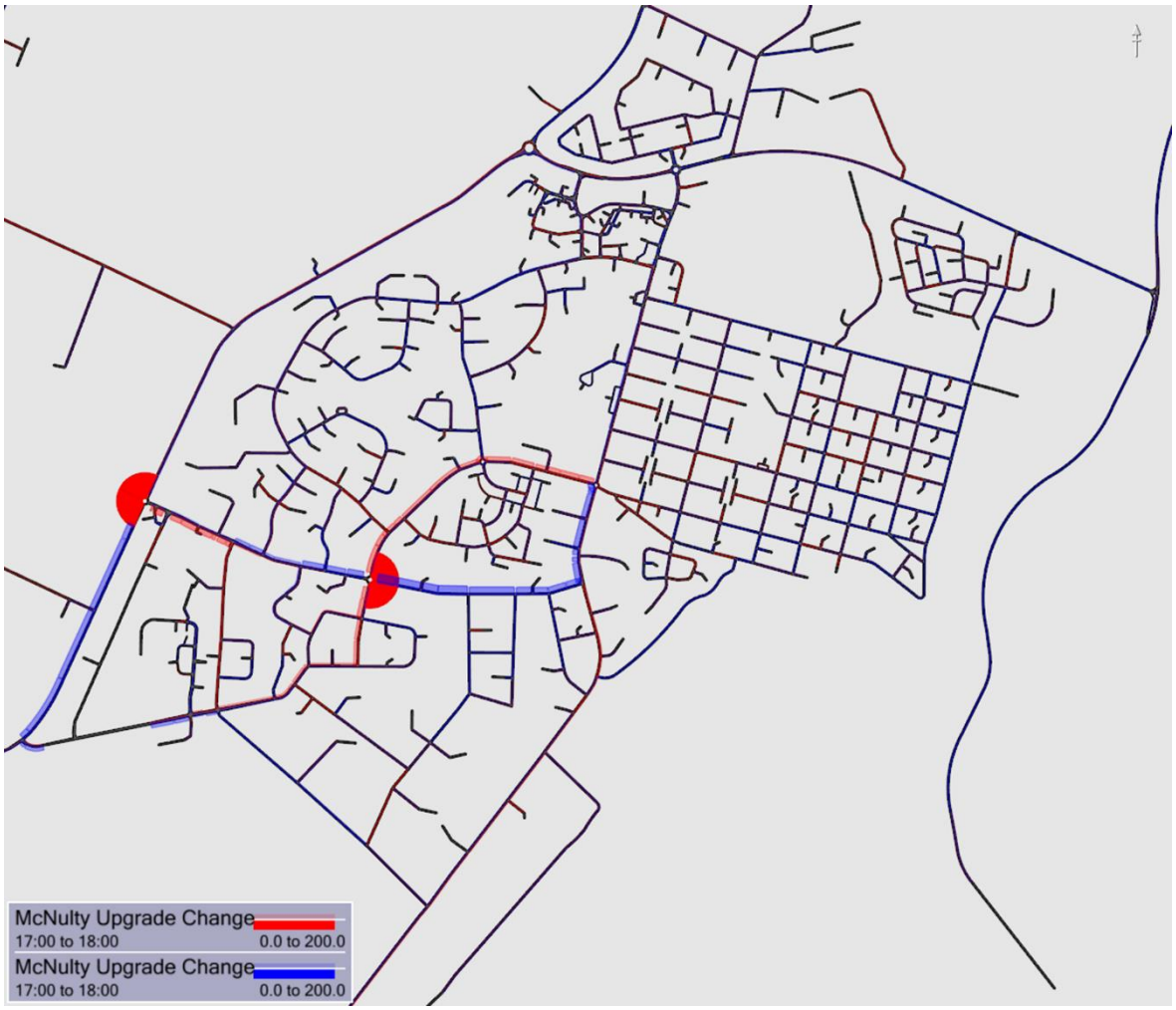

Figure 4.4 Evening Peak Hour Volume Change including RABs (disregard increases at roundabouts)

4.5 SH6 / McNulty and SH6 / Cemetery Performance Summary

The performance of individual turning movements and approaches at the intersections of SH6 / McNulty Rd and SH6 / Cemetery Rd are shown in **Appendix A** for each of the four scenarios tested.

5. Recommendations

The modelling has indicated where the key network effects are forecast to occur on the network due to the proposed industrial plan changes. From the results presented we have the following recommendations:

- Upgrades are required for the SH6 intersection at McNulty Rd regardless of the plan change being implemented, however it is noted that the inclusion of the plan change landuse does increase demands on SH6 / McNulty Rd.
    - A roundabout is likely to form the most suitable upgrade of the SH6 / McNulty Road intersection and is expected meet the performance threshold for requirement in the baseline and plan change scenarios.
    - Cemetery Road is not expected to require upgrades to increase capacity, however movement restrictions or additional safety treatments could be considered in conjunction with the provision of greater capacity and level of service at the McNulty intersection.
    - Further assessment and engagement with Waka Kotahi will be required to confirm the most suitable form for these intersections.
- An upgrade of the McNulty Rd / Gair Ave intersection is recommended regardless of the plan change being implemented and a roundabout is likely to be the most suitable form. This upgrade is less urgent with the plan change implementation as the additional link road is expected to remove some traffic from McNulty Rd.
- It has been highlighted in previous reporting that the town centre has issues with pinch points and resulting congestion at the ring roads such as at Waenga Dr, Barry Ave, Murray Tce and Sargood St. It is recommended that performance at these intersections is monitored, and it is expected that these will need further consideration at some stage in the future regardless of the inclusion of the industrial plan changes.

Appendix A.
Detailed Movement Results for Key SH6 Intersections

Table Error! No text of specified style in document.**.1 Turning Movement Performance at SH6 / McNulty by Scenario**

			Exc Ind PC, Do Min			Exc Ind PC, RABs			Inc Ind PC, Do Min			Inc Ind PC, RABs		
Approach	Road	Movement	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
North	SH6	Left	184	2.3	A	187	2.9	A	197	2.3	A	200	3.0	A
		Thru	224	3.0	A	215	3.6	A	231	3.0	A	217	3.5	A
		Approach	408	2.7	A	402	3.3	A	428	2.7	A	417	3.2	A
East	McNulty	Left	70	28.9	D	74	2.9	A	59	46.9	E	69	3.1	A
		Right	292	50.0	E	313	3.1	A	302	68.1	F	339	3.2	A
		Approach	362	45.9	E	388	3.0	A	360	64.7	F	408	3.1	A
South	SH6	Thru	304	2.3	A	289	5.2	A	327	2.3	A	295	5.5	A
		Right	137	12.9	B	113	5.8	A	127	14.5	B	110	5.5	A
		Approach	441	5.6	A	402	5.3	A	454	5.7	A	405	5.5	A
		Intersection	1211	45.9	E	1192	3.9	A	1242	64.7	F	1230	4.0	A

Table Error! No text of specified style in document.**.2 Turning Movement Performance at SH6 / Cemetery by Scenario**

			Exc Ind PC, Do Min			Exc Ind PC, RABs			Inc Ind PC, Do Min			Inc Ind PC, RABs		
Approach	Road	Movement	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
North	SH6	Left	8	1.2	A	7	1.1	A	18	1.3	A	12	1.6	A
		Thru	273	2.2	A	271	2.1	A	261	2.3	A	259	2.3	A
		Approach	281	2.1	A	277	2.1	A	279	2.3	A	272	2.3	A
East	Cemetery	Left	66	4.8	A	62	5.4	A	72	5.2	A	64	4.0	A
		Right	40	11.6	B	21	12.8	B	65	17.6	C	35	14.5	B
		Approach	106	7.3	A	83	7.3	A	137	11.1	B	99	7.7	A
South	SH6	Thru	375	1.9	A	359	2.0	A	364	2.0	A	348	2.0	A
		Right	48	4.5	A	67	5.0	A	67	4.5	A	84	4.8	A
		Approach	423	2.2	A	426	2.4	A	430	2.4	A	432	2.5	A
		Intersection	810	7.3	A	786	7.3	A	846	11.1	B	802	7.7	A

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Industrial Rezoning Modelling for Industrial District Plan Chapter – 2034 Future Year

Prepared for	Central Otago District Council
Job Number	CODC-J007
Revision	2nd Draft
Issue Date	1 November 2022
Prepared by	Chris Blackmore, Senior Transportation Planner
Reviewed by	Jared White, Principal Transport Engineer Dave Smith, Technical Director

1. Overview

1.1 Summary of previous undertaking

Central Otago District Council (CODC) commissioned Abley Limited (Abley) to provide transport planning advice regarding proposed industrial plan changes on the outskirts of the existing McNulty industrial area to inform the industrial chapter in the District Plan review process. In mid-2020 Abley developed a microsimulation model of the Town of Cromwell using Paramics Discovery software, with the intention to support the implementation of the Cromwell Masterplan Spatial Framework (the Masterplan). The base model representing 2018 was developed, calibrated, and validated but the future year models were not established at that time.

Any impacts on the wider transport network which result from the proposed rezoning need to be viewed in the context of the potential development provided for under the District Plan. To understand the extent of this potential development a future baseline scenario has been developed using growth forecasts reflecting Central Otago District's most current growth projections. An additional scenario is also developed containing the proposed zoning changes, with the model outputs analysed to establish the potential effects on the transport network. The area covering the proposed plan change development is shown within the dashed outline zones in Figure 1.1.

Following a draft of the report a further scenario was developed which included only two of the three proposed areas in the Industrial Plan Change which are the two areas south of the existing McNulty industrial area near Bannockburn Road. Analysis and outputs from the 2050 model year examined in this scenario were provided to CODC in the technical note dated 27 July 2021.

1.2 Model update and 2034-year future model development

Due to significant uncertainty around growth projections due to ongoing impacts from the Covid-19 pandemic, CODC have commissioned annual growth projection updates to be prepared by Rationale. CODC has supplied the latest 2022 projection update, published by Rationale in April 2022, to be utilised in this model update. This update also creates an interim future year to provide insight into potential timing requirements for any infrastructure upgrades which may be required for the network to function efficiently. This year was selected as 2034 to align with the growth projections.

This technical note documents the assumptions used in setting up the 2034 future year Industrial Plan Change and Excluding Plan Change scenarios and provides a brief summary of the transport network performance. Concept level testing was also undertaken to quantify the potential impact of intersection upgrades on McNulty Road, especially the intersection of McNulty Road and SH6.

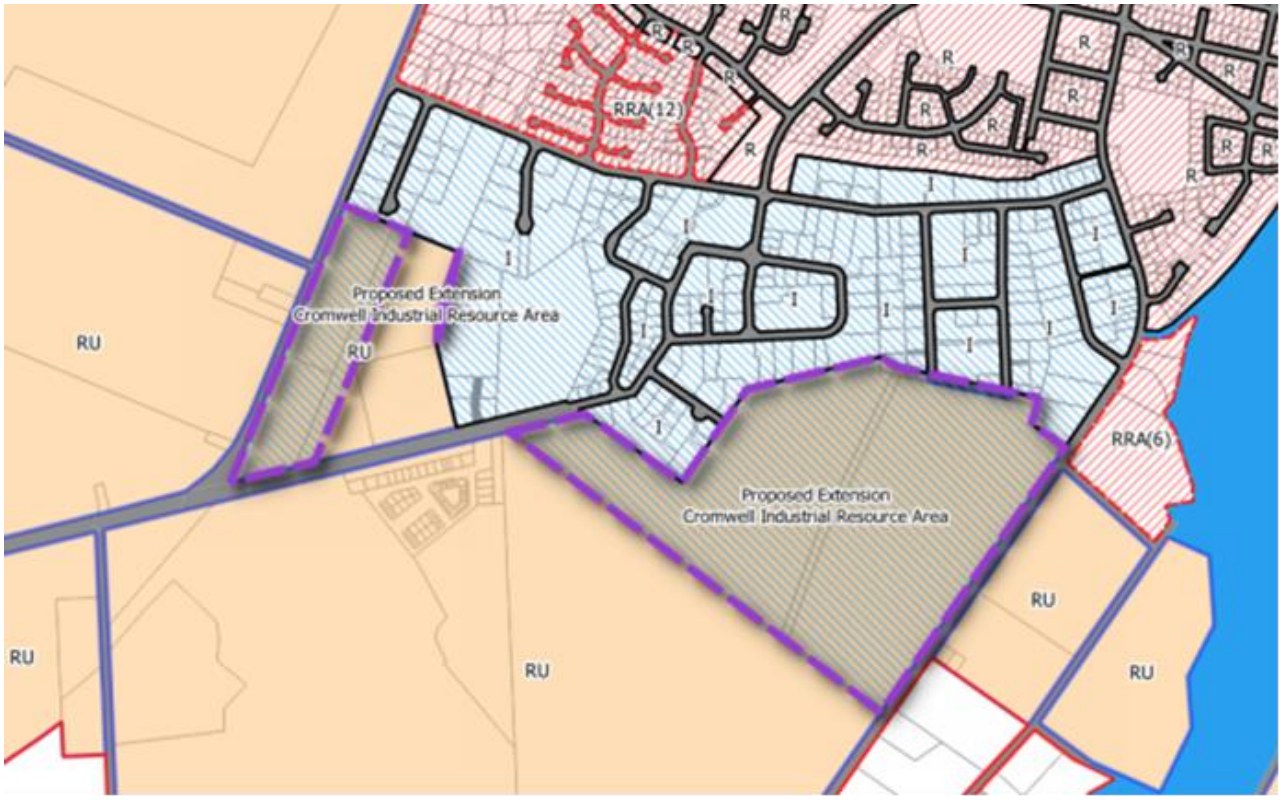

Figure 1.1 Proposed industrial Plan Change areas

2. Future Model Landuse Development

2.1 Growth Targets

The agreed landuse inputs for the future model development are the latest demographic forecasts reflecting Central Otago District's 2022 growth projections. These forecasts were developed by Rationale Ltd and were provided by CODC for this analysis. The agreed future year is a medium-term model representing the year 2034. The relevant demographic growth statistics are presented in Table 2.1.

The Lindis- Nevis Valleys growth area is only partially contained in the model area as is comprised of the mainly agricultural areas excluding the townships of Cromwell, Bannockburn, and Pisa Moorings. The 2018 model occupied household value has been used to apportion the growth that occurs within the model, of the occupied households in the Lindis- Nevis Valleys 53% are found in the modelled area so 53% of the area growth has been used.

Additionally, Abley were provided with the Cromwell Masterplan report (prepared by Rationale in 2018) which has some detail around future growth in the area. Some guidance from this document is used, acknowledging that it has not been updated for the latest 2022 growth forecasts.

Table 2.1 Demographic Forecast Summary from 2018 to 2034, total Cromwell Ward

Area	unit/year	2018	2034	Growth	2018 per HH	2034 per HH
Cromwell Township	Usually Resident Population	5,780	8,977	2,990	2.13	2.14
	Total Ratings Units	3,004	4,668	1,664		
	Total Dwellings	2,736	4,202	1,466		
Bannockburn Township	Usually Resident Population	500	986	486	1.98	2.20
	Total Ratings Units	276	511	235		
	Total Dwellings	252	449	197		
Pisa Moorings Township	Usually Resident Population	590	1481	891	1.91	2.25
	Total Ratings Units	345	776	431		
	Total Dwellings	309	657	348		
Lindis-Nevis Valleys (only 53% within model)	Usually Resident Population	1,390	2,758	1,368	1.79	1.92
	Total Ratings Units	885	1,623	738		
	Total Dwellings	777	1,435	658		
Cromwell Ward Total	Usually Resident Population	8,310	14,202	5,892	2.04	2.11
	Total Ratings Units	4,510	7,578	3,068		
	Total Dwellings	4,074	6,743	2,669		

2.2 Residential Growth Apportionment

The total dwelling growth was used in the residential growth apportionment and then area specific occupied dwelling rates were applied informed by the growth targets. In the 2018 Census the urban Cromwell area has an occupied dwelling proportion of 88.2%, whereas the Lindis-Nevis Valleys has a proportion of 85.7% and these occupancy rates have been carried forward to the 2034 future year.

Residential growth is initially apportioned to the known greenfield sites with total demand taken from the 2022 growth projections. Given the scale of residential growth the projected household demands exceeds the currently zoned residential area available. To apportion the remaining residential demand potential future residential greenfield and medium-density residential areas were identified by CODC. Lot size guidelines from the District Plan have been used to determine the scale of development in these areas, with a minimum lot size of 200m2 assumed for medium-density development. It was assumed that currently zoned greenfield areas would be developed fully before future sites, the remaining demand was then apportioned pro-rata over the remaining future capacity.

The growth of total households in the sub areas along with the split in current greenfield and future development is shown in Table 2.2. The estimate of total dwelling capacity and uptake to 2034 in greenfield locations, RRAs, and potential medium density developments calculated from average lot sizes are shown in Table 2.3.

Table 2.2 Subarea residential forecasts for total dwellings

Sub Area	2034 Total Growth	Greenfield (Current)	Remaining Growth	Future Greenfield and MDR Estimate	Uptake of Future Cap to 2034
Cromwell	1,466	1,218	248	565	338
Bannockburn	197	140	57	60	58
Pisa Moorings	348	100	248	360	280
Lindis-Nevis Valleys	349	166	183	61	61
Total	2,360	1,624	736	1,046	736

Table 2.3 Greenfield Residential Dwelling Capacity Estimates and total uptake

Growth Area	Greenfield Cap (Current)	Future Greenfield and MDR Estimate Cap	Total Uptake
RR12, including additional anticipated medium density	446	303	626
RR3	38	0	38
Ripponvale PC14 development	136	0	136
Wooing Tree Masterplan area	219	0	219
Top 10 holiday park development	180	0	180
Gair Ave / Olds Cres development	267	0	267
Freeway Orchard development	0	263	157
River Terrace and Highlands	68	0	68
Bannockburn	140	0	140
Domain Rd, Bannockburn	0	60	58
Pisa Moorings, including additional anticipated medium density	100	360	380
Lowburn	30	61	91
Total	1,624	1,046	2,360

Once the current greenfield dwellings were assigned there were 736 dwelling remaining to be assigned to future development areas. Assigning the remaining anticipated growth from each subarea projection resulted in an excess of 122 dwellings in the Lindis-Nevis Valley. This demand was reapportioned to the other subareas pro-rata over the remaining capacity in each area, resulting in an additional 90 dwellings in Cromwell, 32 dwellings in Pisa Moorings, and 1 dwelling in Bannockburn. It should be noted that if additional infill and greenfield development was proposed in the Lindis-Nevis Valley it would be expected to reduce the pro-rata apportionment.

2.3 Commercial Growth Apportionment

Town Centre Commercial and Existing Industrial

The revised 2050 methodology included increasing the commercial activity by 20% across the study area including the Town Centre. This growth was factored to match the expected employment growth in the revised 2034 forecasts for Cromwell township. Where previous grow from 2018 to 2050 was 3,363 jobs, the revised Cromwell growth forecasts from 2018 to 2034 is 1,601 jobs resulting in a factor of 48% of expected 2050 growth. This corresponds to a Town Centre growth of 9.6% from 2018 to 2034.

Rural Industrial and Agricultural

Rural employment growth is significantly high in the revised 2034 projections compared to the previous 2050 projections. For this reason, rural growth has been factored by the projected increase in employment between 2018 and 2034. The revised growth is 1,865 jobs, from 2,000 in 2018 to 3,865 in 2034, a growth factor of 93%. For comparison the previous 2050 growth in rural employment was 76 jobs, a growth factor of 3.8%.

McNulty Industrial Area and Industrial Plan Change Area

The industrial areas south of McNulty Rd were analysed further as this is a key growth area with capacity to accommodate future development. The recently consented industrial subdivision in the east of the McNulty industrial area (covering Harvest Rd, Cemetery Rd, and Old Saleyards Rd) was included in this analysis as it would be expected to develop in line with existing industrial areas over the short to medium term.

The recent consented development analysis with the model was used to inform the analysis of the future baseline and scenario with the industrial plan changes. This included calculating a total floor area from the total site area assuming 77% coverage once roads and other areas are established and the 30% utilisation of land in buildings. The Cromwell Masterplan identified the total areas of the industrial areas as follows in Figure 2.1 and the industrial plan change considered covers Area 19 and Area 20.

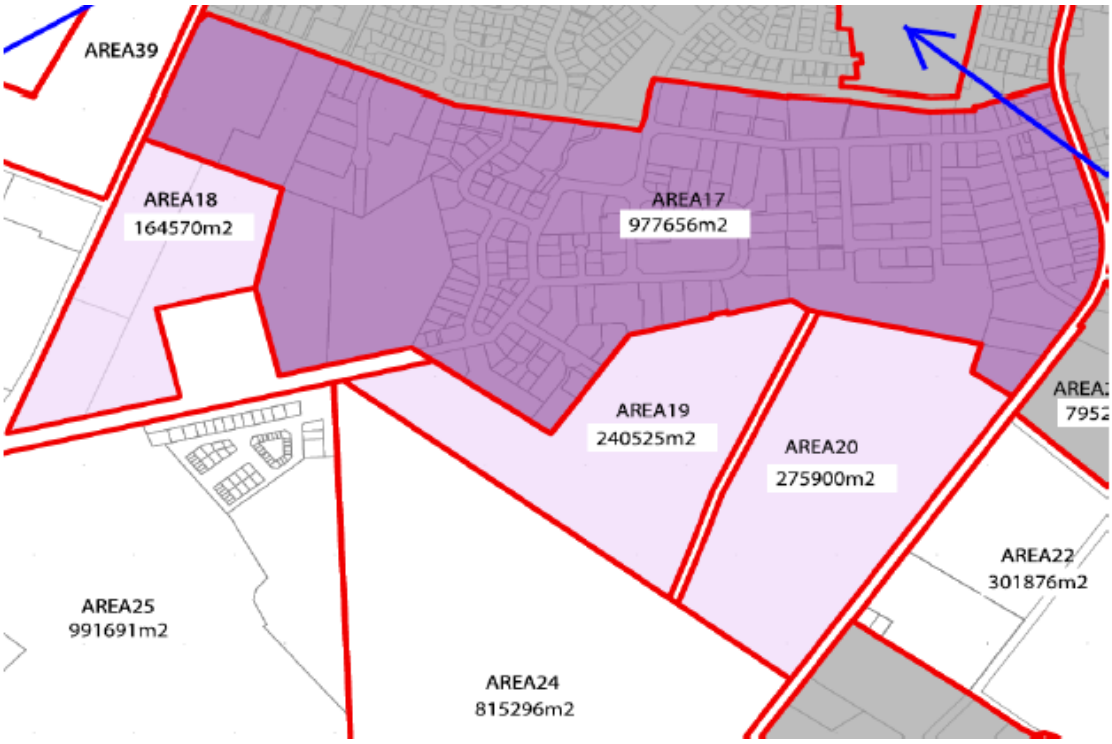

Figure 2.1 General scale of Industrial areas and Plan Change site, note only the western portion of Area 18 is included

A detailed study undertaken to check the coverage and utilisation rates within the existing McNulty industrial areas from aerial photography. The coverage was deemed appropriate however the utilisation ranged somewhat with a denser warehousing block having a utilisation of 38% but more typical areas ranging from 15% to 25%. The average utilisation ranged from 18% to 22% depending on the inclusion of the warehousing block, so a utilisation rate of 20% has been adopted in this analysis. The calibrated trip rate from the existing McNulty area was retained and applied to any infill available in the area, whereas the evening peak hour rate for the recently consented development (1.3trips per 100m2 GFA) was used for development in new industrial areas including the proposed Plan Change development.

The total area of the McNulty Industrial area that can be utilised is calculated to be approximately 150,000m2 GFA. Of the total available area approximately 111,600 is existing and the consented site would take up 26,700m2.

To make this area fully utilised for the Baseline Scenario the existing floorspace and trip making activity is scaled by 1.105. The breakdown of utilised land and associated trip generation of the industrial areas is shown in Table 2.4.

Table 2.4 Existing and Proposed Industrial Building areas, 2050 future year

Industrial Area	Raw Area	Site Coverage (77%)	Utilisation (20%)	PM peak hour trips	PM 2 hour total
Existing 2018 McNulty	978,000	n/a	111,600	1,515	2,714
Recent Consented Area	174,000	134,000	26,700	347	622
Total 2050 Baseline	978,000		150,100	2,022	3,621
PC Area 20 (Z303)	276,000	212,000	42,350	551	986
PC Area 19 (Z303)	241,000	185,000	36,900	480	860

Industrial Area	Raw Area	Site Coverage (77%)	Utilisation (20%)	PM peak hour trips	PM 2 hour total
PC Area 18 (Z314)	93,000			**	**

To obtain the two-hour demand the peak hour demand is scaled by 1.791, as per the base model. The overall interpeak activity from the industrial areas has been derived by comparing the base model total volumes in the two-hour evening peak period to the five-hour interpeak period, resulting in a scaling factor of 1.597 to get from evening peak demand to interpeak demand.

As with the Town Centre 2034-year job growth, the industrial growth for the 2034 year was factored in line with the overall growth of employment in Cromwell. The total two-hour, two-way trips in Area 19 and Area 20 (1,846 trips in 2050) were factored by 48% to give the equivalent growth to 2034. This assumes that the Plan Changes areas will develop at the same rate as remaining industrial areas and any additional infill within the existing industrial zoning.

After the 2050 future year model development, Area 18 was partially notified as part of Plan Change 19. To calculate the trip generation in the 2034 future year the area covered by Area 18 was estimated as 93,000sqm and trips were reapportioned from the total calculated for Area 19 and Area 20. The total trips assigned to each Plan Change Area for the 2034 future year are as in Table 2.5.

Table 2.5 Plan Change 19 Trip Generation, 2034 future year

Industrial Area	Raw Area	PM peak hour trips	PM 2 hour total
PC Area 20	276,000	234	420
PC Area 19	241,000	204	366
PC Area 18 (partial)	93,000	76	137

2.4 Excluding Plan Change Scenario Landuse

The 2022 growth projections are predicated on a suitable amount of land capacity to meet the employment expectations in the sub-area. This means that the baseline landuse developed with these projections includes area for industrial expansion implicitly, and for this reason it was decided to modify an ‘excluding industrial expansion’ scenario to test the potential impacts of not providing Area 19 and Area 20 for industrial use.

The following high-level assumptions were used to reallocate the trips generated by Area 19 and Area 20:

1. An increase in utilisation of existing industrial area would be assumed, 50% of the trip total has been reallocated to existing industrial activity along McNulty Rd.
2. Some industrial activity would relocate to nearby areas, 25% of the trip total has been reallocated to the Wanaka and Alexandra external connections which represents an increase in interaction between Cromwell residents and external employment.
3. Some industrial activity either leaves the area completely (i.e. completely self-contained within another area) or does not occur, the balance of 25% of trips were not reallocated which represents these trips being either fully external to the area or not being undertaken in the first place.

The trip allocation assumptions result in an increase in vehicle travel along both SH6 northbound and SH8 southbound, as well as increasing vehicle travel along McNulty Rd. This has impacts on McNulty Rd intersections as noted in Section 4.

2.5 External Zone Traffic Volume Growth

The most recent Average Annual Daily Traffic (AADT) volumes for the four roads representing the external connections of the model were obtained from Waka Kotahi, covering the ten years from 2012 to 2022. There was a noticeable drop in the 2020 count values due to effects from Covid19 travel restrictions. The average growth across all sites from 2016 to 2019 was 4.35% annually which aligned with the population growth of Cromwell in the 2016 and 2017 years as shown in the Cromwell Masterplan report.

The development of the 2034 future year has coincided with an update of the Queenstown Lakes District Strategic Transportation Model, which includes a high-level representation of Cromwell. This model has been used to inform changes on SH6 to the south-west (Kawarau Gorge) and north-west (towards Wanaka) external connections, and account for changes in wider landuse interactions between Cromwell and the wider Queenstown Lakes district. The growth rates for each external connection are shown in Table 2.6 for the interpeak and evening peak periods.

Table 2.6 External volume growth 2018 – 2034 by period

External Connection	Interpeak Growth 2018 - 2034	PM Peak Growth 2018 - 2034
SH8 Southeast	24%	39%
SH8 Northeast	1%	4%
SH6 Northwest	113%	87%
SH6 Southwest	11%	10%

3. Future Year Network

3.1 Baseline Network

The initial road network set up for the 2034 future year was generally in line with the 2018 base network. A key infrastructure input is a new single lane roundabout at the SH6 and SH8B intersection which has been coded in line with the layout constructed under NZUP[1]. Also included is the newly constructed roundabout at the SH8B and Barry Ave intersection, including the northern leg which forms the main access to the Wooing Tree development. The area surrounding the SH6 and SH8B intersection is shown in Figure 3.1.

Figure 3.1 Modelled Network near SH6 and SH8B intersection

The 2018 network was simplified when it was set up with many intersections with single lane approaches. The future network operation was observed for performance issues that were related to this, with additional capacity added where there is existing space for vehicles to pass another that is waiting to turn. This was not a response to provide additional capacity over what is already provided but to better match the existing intersection layouts.

The main additional network detail in the consented industrial subdivision was new network constructed extending Harvest Road to connect McNulty Road and Cemetery Road.

[1] https://www.nzta.govt.nz/projects/sh6-sh8b-cromwell-intersection-improvements/

3.2 Network with Proposed Industrial Plan Changes

There are presently no details on what the road network would look like within the proposed industrial plan changes, this would normally be presented as part of an Outline Development Plan (ODP). However, the likely main roads that would serve these large areas have been assumed for this testing stage. For the two south-eastern sites a new road has been assumed on the south-western boundary of both sites between Bannockburn Road and Cemetery Road. Another link has been assumed to run off this new road between the two sites, connecting them both into the existing area via the western side of Ree Crescent. The industrial area network including the proposed Plan Change sites is shown in Figure 3.2.

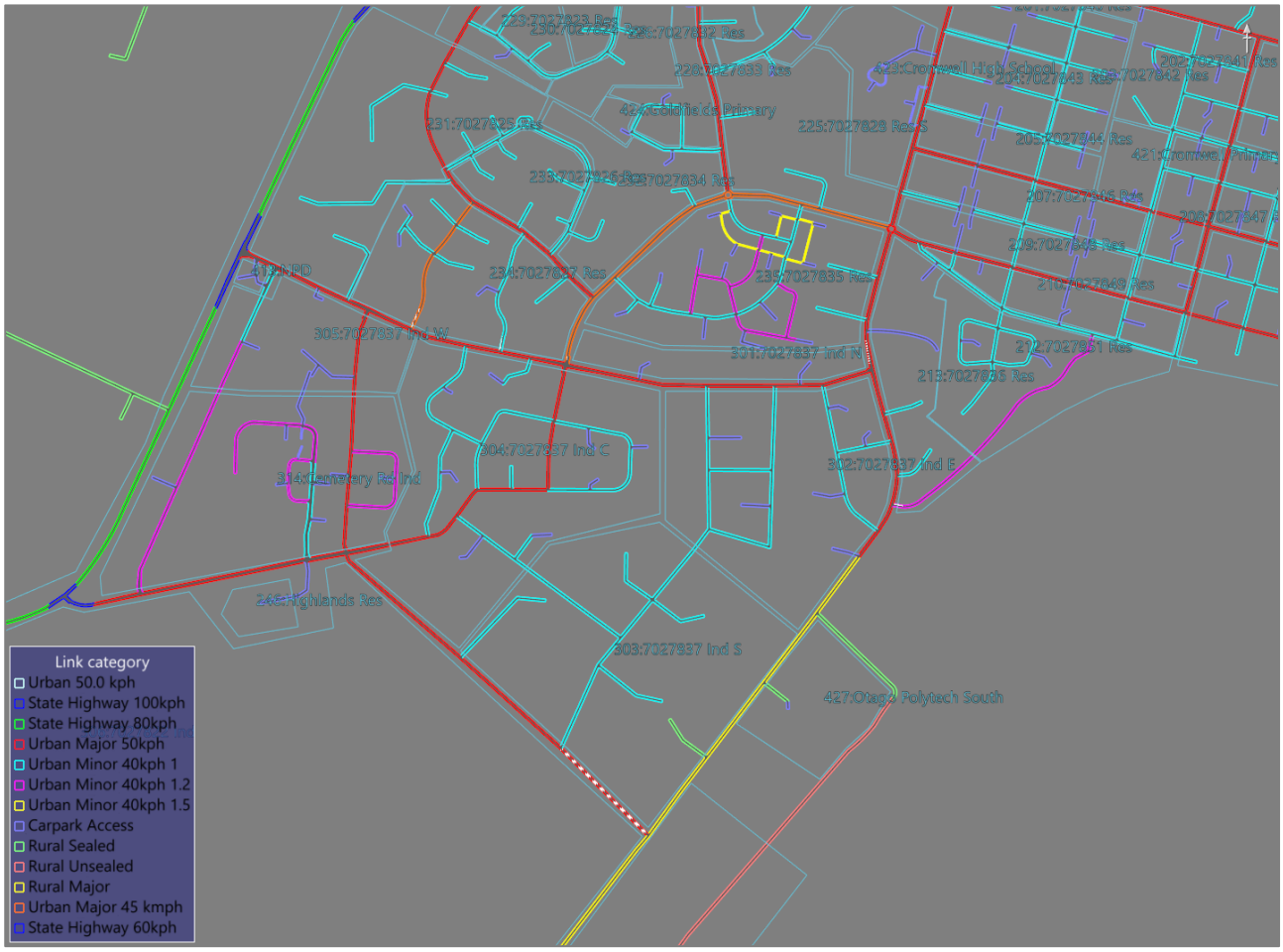

Figure 3.2 Modelled Network near industrial plan changes

3.3 McNulty Road Upgrade Options

The capacity of intersections along McNulty Road has been noted by CODC as a significant bottleneck, especially the intersection of McNulty Road and SH6. The current intersection configuration is a priority T intersection, with McNulty Rd as the minor leg. There is a short, painted acceleration lane northbound, however it is not clear what proportion of vehicles utilise the additional space.

The do minimum scenario includes safer speed zones (shown in blue in Figure 3.2) for the SH6 intersections at both Cemetery Rd and McNulty Rd. The option scenario replaces the McNulty Rd and SH6 intersection with an appropriately sized single-lane roundabout. The priority crossroads at the McNulty Rd and Gair Ave intersection is also replaced with a single-lane roundabout as significant

queueing was observed there during initial testing of the base network in the 2034 future year model. The option network on McNulty Rd is shown in Figure 3.3.

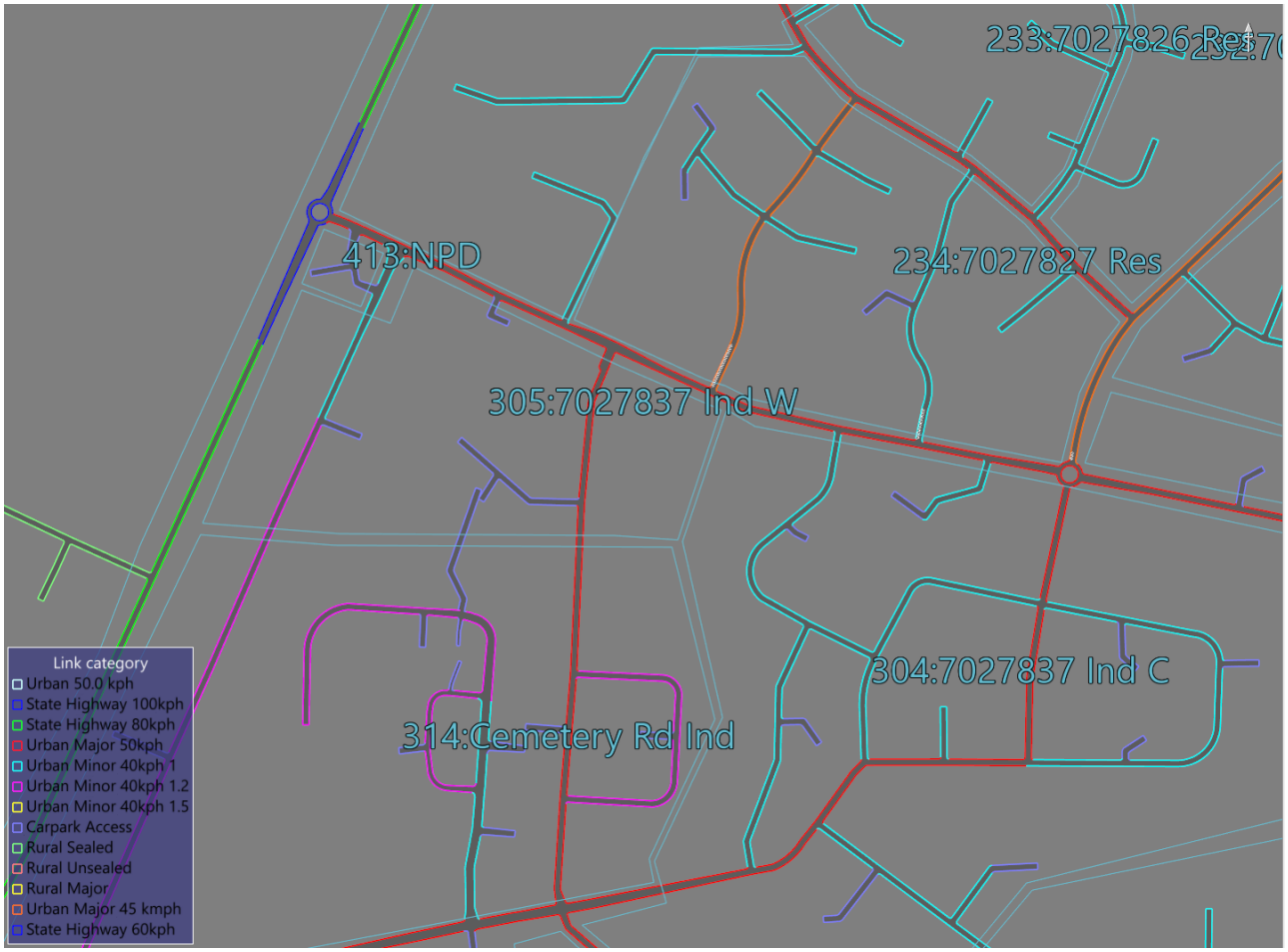

Figure 3.3 Modelled option network on McNulty Road, alterations circled in red

4. Future Model Operation Comparison

4.1 Interpeak Model Performance

Results show good performance in the interpeak hour in both with and without the proposed industrial plan changes. Changes in intersection delay are low and level of service is mostly very good, with no intersection exceeding LOS B in any scenario. For this reason, the following result summaries focus on the evening peak hour.

4.2 Intersection Performance Excluding Industrial PC Areas

The performance of key intersections has been summarised in Table 4.1 for the 2034 evening peak hour. These results cover the baseline scenario, being the projected 2034 landuse excluding the industrial plan changes and without infrastructure upgrades on McNulty Rd.

The evening peak periods are much busier than the interpeak period, which is reflective of the 2018 base model, and there are several intersections which experience degraded performance, most notably:

- SH6 / McNulty Rd operates at a LOS E for the McNulty Rd approach, indicating that this intersection is operating close to the practical capacity of the intersection. This is likely to result in degraded intersection performance, with long queues and more variables delays experienced by vehicles accessing SH6.
- McNulty Rd / Gair Ave priority crossroads operates at LOS F for the southern Gair Ave approach, indicating that this intersection is operating in excess of the practical capacity of the intersection. In practice, this will often result in an increase in rat-running as vehicles attempt to bypass the congested intersection. It can also result in drivers selecting smaller gaps than during normal operation, potentially leading to an increase in safety issues.
- Several intersections around the town centre are operating at LOS C, including the roundabout at SH6 / SH8B. This is generally acceptable in peak hour and is not indicative of performance issues.

Table 4.1 2034 Baseline Scenario Evening Peak Hour intersection performance

Intersection	Baseline - 2034 exc Plan Changes, Do Minimum		
	Volume	Delay (s)	LOS
SH6 / Pisa Moorings Rd / Clark Rd	1330	11.5	B
SH6 / Lowburn Valley Rd	1471	13.0	B
SH6 / Burn Cottage Rd	1471	3.2	A
SH6 / Shortcut Rd	1492	2.2	A
SH6 / SH8b	1971	24.6	C
SH6 / Ripponburn	1095	5.9	A
SH6 / Ripponvale Rd	1097	20.2	C
SH6 / McNulty Rd	1211	45.9	E
SH6 / Ord Rd	711	5.7	A
SH6 / Cemetery Rd	810	7.3	A
SH6 / Sandflat Rd	403	6.0	A
SH6 / Pearson Rd / Ripponvale Rd	324	5.3	A
SH8b / Sargood Rd	1355	27.5	D
SH8b / Barry Ave	1221	11.0	B
SH8b / Shortcut Rd	631	23.8	C
SH8b / Bell Ave	527	6.1	A
SH8b / Alpha St	857	13.8	B
SH8 / SH8b	997	5.7	A
Sargood / Iles St	1124	19.4	C
Barry Ave / Waenga Dr	1293	9.2	A

Intersection	Baseline - 2034 exc Plan Changes, Do Minimum		
Barry Ave / Neplusultra St	1263	22.6	C
Barry Ave / Molyneaux Ave	1124	17.9	C
Barry Ave / Inniscort St / Gair Ave	1156	4.9	A
Gair Ave / Jollys Rd	280	4.8	A
McNulty Rd / Gair Ave	794	75.6	F
Barry Ave / McNulty Rd	751	10.4	B

The pattern of traffic volumes around the township can be seen in Figure 4.1 for the evening peak hour.

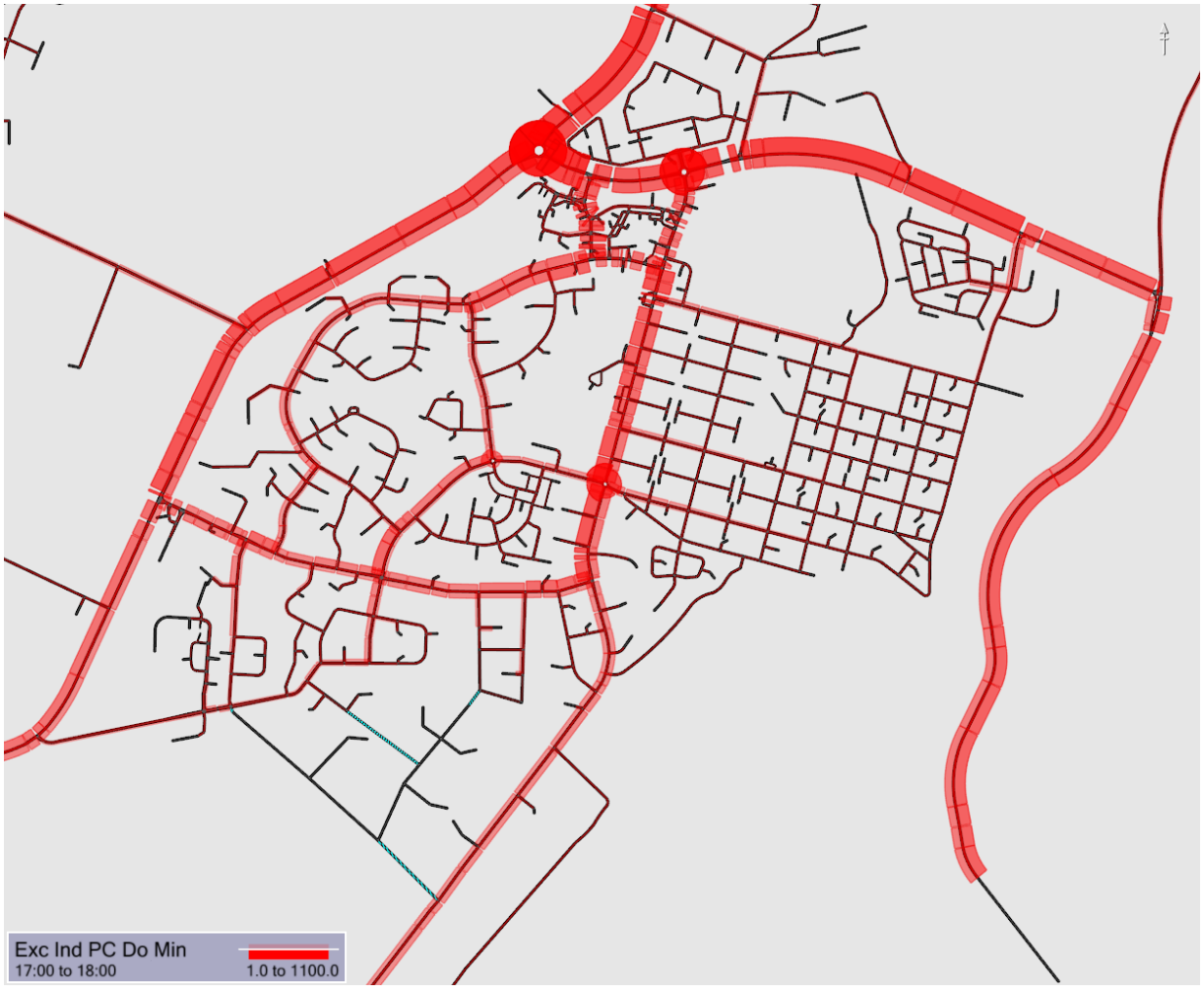

Figure 4.1 Evening Peak Hour Volumes for 2034 Baseline scenario

The 2034 future year model sees significant growth around the township compared to the 2018 base model. The change in volume in the evening peak period between 2018 and 2034 is shown in Figure 4.2, noting that this comparison has been made over the updated 2034 do minimum network.

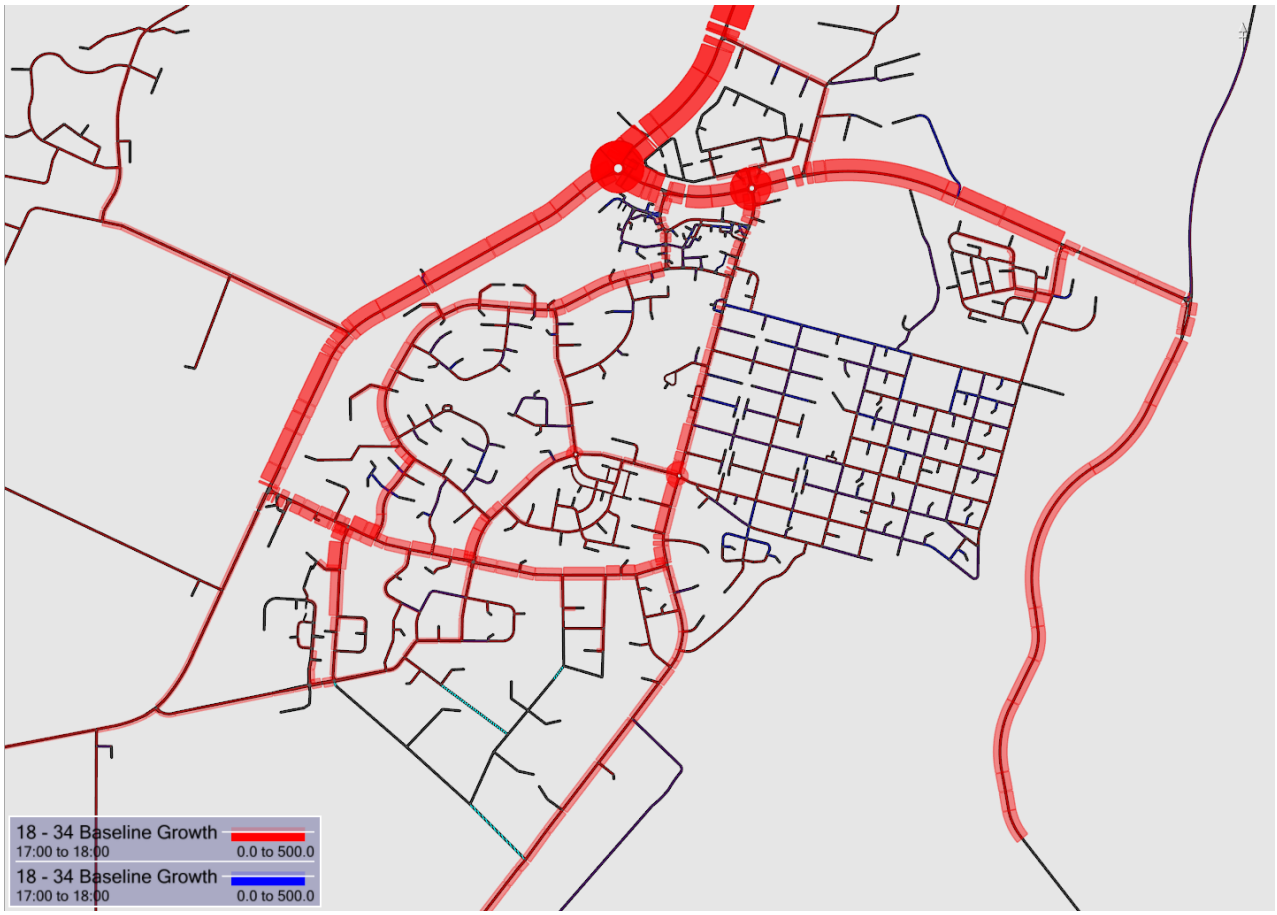

Figure 4.2 Evening Peak Hour Volume Change, 2018 to 2034, on 2034 do minimum network

4.3 Intersection Performance Including Industrial PC Areas

The performance of key intersections has been summarised in Table 4.2 for the 2034 evening peak hour. These results cover the option landuse scenario, being the projected 2034 landuse including the industrial plan changes and without infrastructure upgrades on McNulty Rd.

Key changes in intersection and network performance with the inclusion of the Area 19 and Area 20 industrial areas are as follows:

- The largest impact on the network performance comes from the addition of the plan change access road, which creates a direct link with Harvest Rd between McNulty Rd and Bannockburn Rd. This removes vehicle trips from McNulty east of Harvest Rd, which in turn improves intersection performance for the eastern minor road approaches to McNulty Rd. The McNulty Rd / Gair Ave intersections operates much more efficiently compared to the baseline scenario, improving to LOS D on the worst performing approach.
- The SH6 / McNulty Rd intersection is clearly operating in excess of capacity, and an increase in vehicle trips is not able to be accommodated on the McNulty Rd approach.
- There is a small increase in volumes on Cemetery Rd, however the intersection still operates well within capacity limits.

Table 4.2 2034 Including Plan Change Scenario Evening Peak Hour intersection performance comparison

Intersection	2034 Including Plan Change, Do Min			Change from Baseline	
	Volume	Delay	LOS	Volume	Delay
SH6 / Pisa Moorings Rd / Clark Rd	1299	9.3	A	-31	-2.1
SH6 / Lowburn Valley Rd	1445	14.4	B	-26	1.4
SH6 / Burn Cottage Rd	1444	2.8	A	-26	-0.4
SH6 / Shortcut Rd	1467	2.2	A	-26	0.0
SH6 / SH8b	1977	19.3	B	6	-5.3
SH6 / Ripponburn	1144	6.1	A	49	0.2
SH6 / Ripponvale Rd	1147	28.1	D	50	7.9
SH6 / McNulty Rd	1242	64.7	F	31	18.8
SH6 / Ord Rd	724	6.1	A	14	0.3
SH6 / Cemetery Rd	846	11.1	B	37	3.7
SH6 / Sandflat Rd	390	6.7	A	-13	0.7
SH6 / Pearson Rd / Ripponvale Rd	319	5.3	A	-6	0.0
SH8b / Sargood Rd	1315	24.5	C	-40	-3.0
SH8b / Barry Ave	1180	11.0	B	-42	0.0
SH8b / Shortcut Rd	591	23.6	C	-40	-0.2
SH8b / Bell Ave	498	6.7	A	-29	0.5
SH8b / Alpha St	825	14.2	B	-32	0.5
SH8 / SH8b	947	5.0	A	-50	-0.8
Sargood / Iles St	1105	17.7	C	-19	-1.7
Barry Ave / Waenga Dr	1280	9.4	A	-14	0.2
Barry Ave / Neplusultra St	1257	22.6	C	-6	0.0
Barry Ave / Molyneaux Ave	1143	15.9	C	20	-2.0
Barry Ave / Inniscort St / Gair Ave	1200	5.3	A	44	0.3
Gair Ave / Jollys Rd	281	4.7	A	1	-0.1
McNulty Rd / Gair Ave	748	26.2	D	-45	-49.4
Barry Ave / McNulty Rd	676	9.3	A	-75	-1.1

The change in traffic patterns as a result of the industrial plan changes is shown in Figure 4.3.

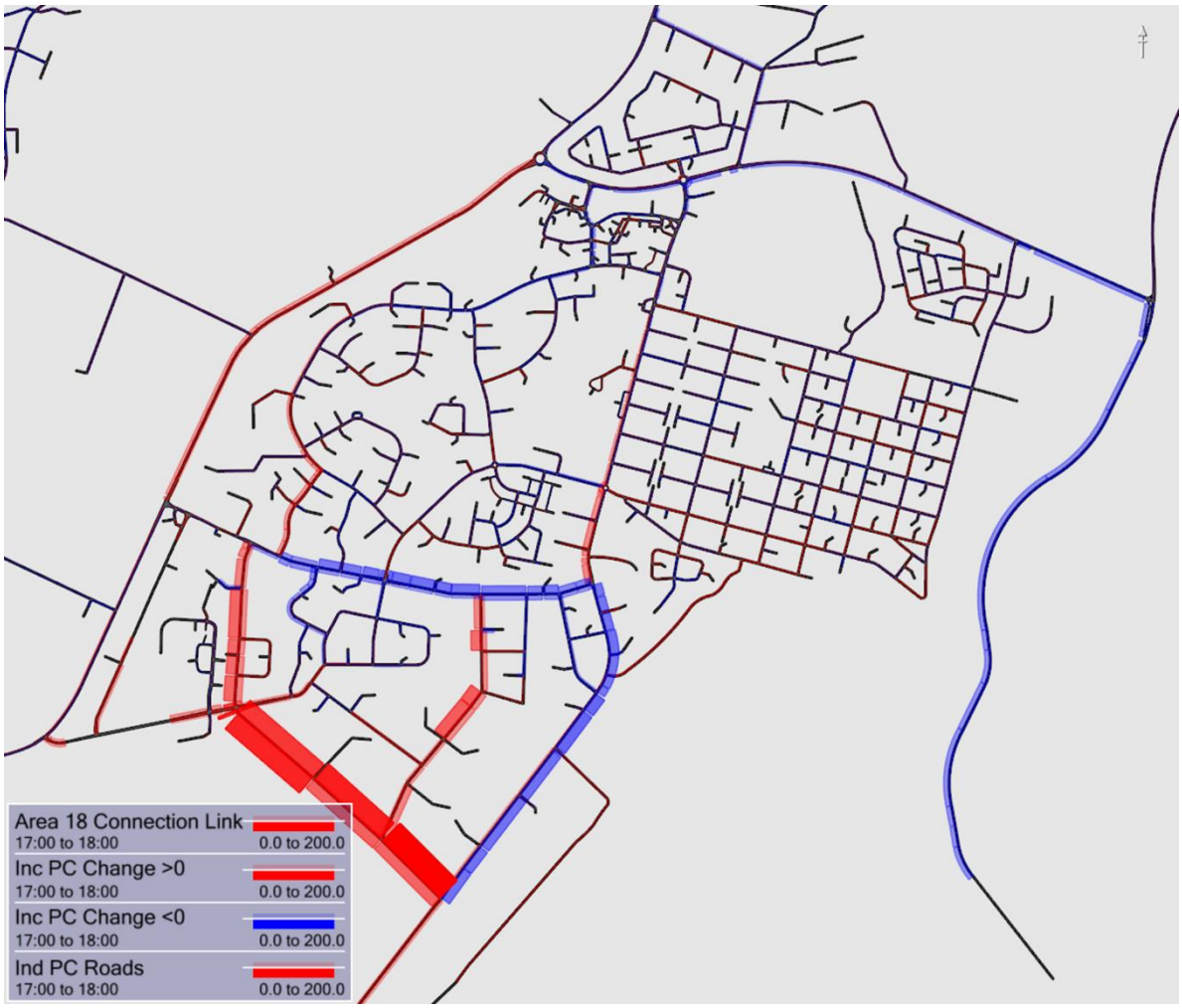

Figure 4.3 Evening Peak Hour Volume Change including Industrial Plan Change

4.4 Intersection Performance with McNulty Rd Upgrades

Testing of the landuse scenarios in Section 4.2 and 4.3 demonstrates that the key intersections experiencing congestion and capacity constraints are the priority intersections at SH6 / McNulty Rd and McNulty Rd / Gair Ave.

The do-minimum infrastructure at SH6 / McNulty Rd already includes a safer speed zone and formalisation of the seagull arrangement for the right turn, so the next logical progression is to an appropriately sized roundabout.

Due to the context of major intersections surrounding the McNulty Rd / Gair Ave, as well as safety considerations, a roundabout was considered the most appropriate infrastructure upgrade at that location also. It should be noted that these intersection arrangements have been tested at a high-level concept design stage only, and further refinement would be expected at the detailed design stage to ensure the geometry and lane configuration is appropriate for expected heavy vehicle volumes as well as other vulnerable road users.

Including single-lane roundabouts at the intersections of SH6 / McNulty Rd and McNulty Rd / Gair Ave provides significant increases in capacity, improving intersection to LOS A in both cases. This reduces rat-running of vehicles turning right at Cemetery Rd, as well as reducing vehicles rat-running via Pinot

Noir Dr to avoid queueing at Gair Ave. This represents a network operating far more efficiently than the do-minimum scenarios.

The performance of key intersections has been summarised in Table 4.3 for the 2034 evening peak hour. These results cover the baseline scenario, being the projected 2034 landuse including the industrial plan changes and infrastructure upgrades on McNulty Rd.

Table 4.3 2034 Including Plan Change and McNulty RABs Scenario Evening Peak Hour intersection performance comparison

Intersection	2034 including Plan Change, RABs			Change from including PC, Do-Min	
	Volume	Delay	LOS	Volume	Delay
SH6 / Pisa Moorings Rd / Clark Rd	1288	10.1	B	-11	0.8
SH6 / Lowburn Valley Rd	1436	16.3	C	-9	1.9
SH6 / Burn Cottage Rd	1439	3.5	A	-6	0.7
SH6 / Shortcut Rd	1461	2.3	A	-6	0.1
SH6 / SH8b	1972	21.7	C	-5	2.3
SH6 / Ripponburn	1144	6.4	A	0	0.3
SH6 / Ripponvale Rd	1140	26.9	D	-7	-1.1
SH6 / McNulty Rd	1230	4.0	A	-12	-60.7
SH6 / Ord Rd	673	5.5	A	-51	-0.5
SH6 / Cemetery Rd	802	7.7	A	-44	-3.4
SH6 / Sandflat Rd	378	6.5	A	-12	-0.2
SH6 / Pearson Rd / Ripponvale Rd	314	5.1	A	-5	-0.1
SH8b / Sargood Rd	1307	23.3	C	-8	-1.3
SH8b / Barry Ave	1170	11.0	B	-10	0.0
SH8b / Shortcut Rd	588	21.5	C	-3	-2.1
SH8b / Bell Ave	491	4.5	A	-7	-2.1
SH8b / Alpha St	820	14.8	B	-5	0.6
SH8 / SH8b	939	5.5	A	-9	0.5
Sargood / Iles St	1090	15.5	C	-15	-2.2
Barry Ave / Waenga Dr	1277	9.1	A	-3	-0.3
Barry Ave / Neplusultra St	1253	31.2	D	-5	8.6
Barry Ave / Molyneaux Ave	1141	17.7	C	-3	1.8
Barry Ave / Inniscort St / Gair Ave	1164	5.9	A	-36	0.6
Gair Ave / Jollys Rd	275	5.1	A	-6	0.4
McNulty Rd / Gair Ave	768	4.1	A	20	-22.1
Barry Ave / McNulty Rd	688	7.5	A	12	-1.8

The change in traffic patterns as a result of the McNulty Rd upgrades is shown in Figure 4.4.

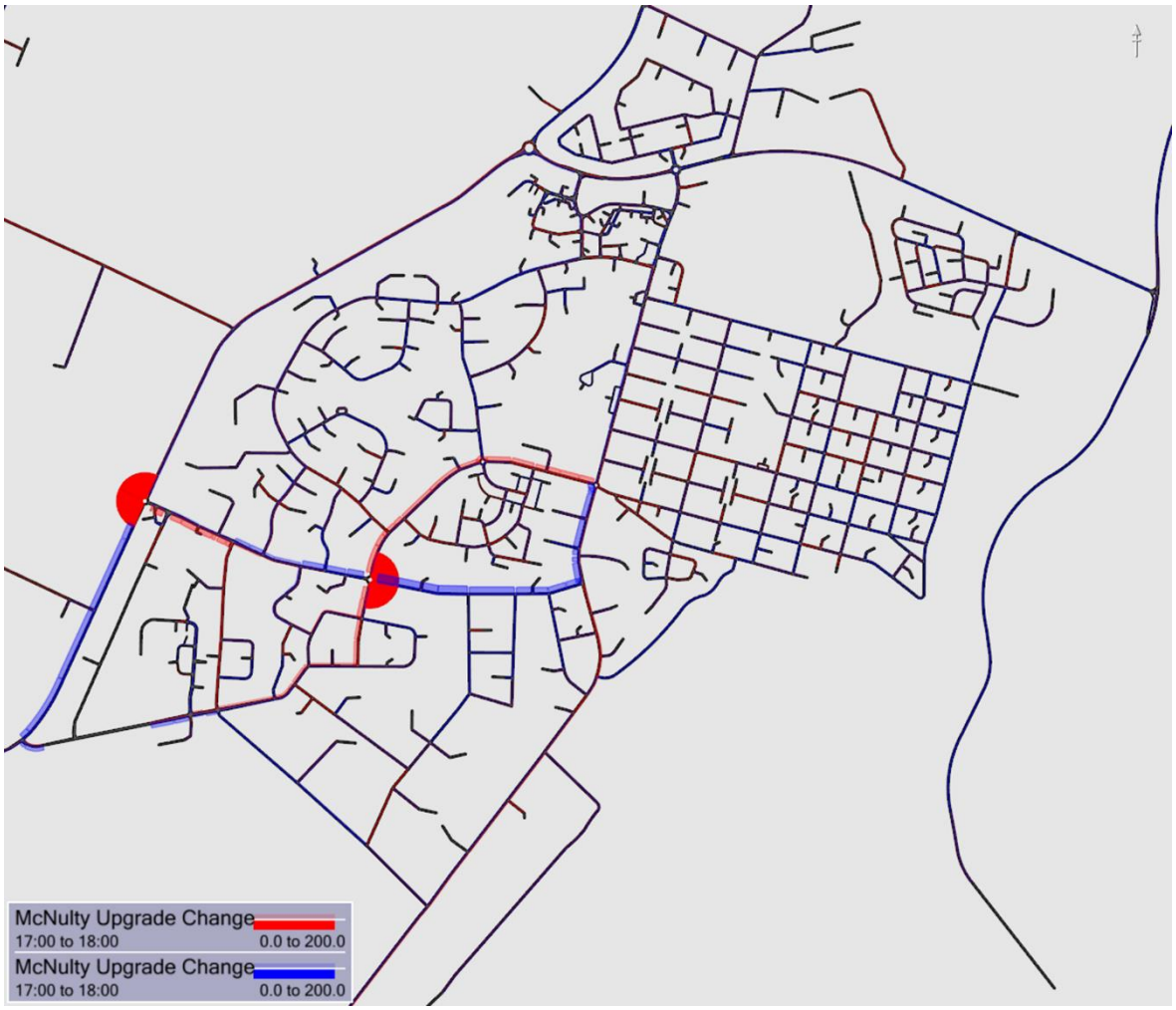

Figure 4.4 Evening Peak Hour Volume Change including RABs (disregard increases at roundabouts)

4.5 SH6 / McNulty and SH6 / Cemetery Performance Summary

The performance of individual turning movements and approaches at the intersections of SH6 / McNulty Rd and SH6 / Cemetery Rd are shown in **Appendix A** for each of the four scenarios tested.

5. Recommendations

The modelling has indicated where the key network effects are forecast to occur on the network due to the proposed industrial plan changes. From the results presented we have the following recommendations:

- Upgrades are required for the SH6 intersection at McNulty Rd regardless of the plan change being implemented, however it is noted that the inclusion of the plan change landuse does increase demands on SH6 / McNulty Rd.
    - A roundabout is likely to form the most suitable upgrade of the SH6 / McNulty Road intersection and is expected meet the performance threshold for requirement in the baseline and plan change scenarios.
    - Cemetery Road is not expected to require upgrades to increase capacity, however movement restrictions or additional safety treatments could be considered in conjunction with the provision of greater capacity and level of service at the McNulty intersection.
    - Further assessment and engagement with Waka Kotahi will be required to confirm the most suitable form for these intersections.
- An upgrade of the McNulty Rd / Gair Ave intersection is recommended regardless of the plan change being implemented and a roundabout is likely to be the most suitable form. This upgrade is less urgent with the plan change implementation as the additional link road is expected to remove some traffic from McNulty Rd.
- It has been highlighted in previous reporting that the town centre has issues with pinch points and resulting congestion at the ring roads such as at Waenga Dr, Barry Ave, Murray Tce and Sargood St. It is recommended that performance at these intersections is monitored, and it is expected that these will need further consideration at some stage in the future regardless of the inclusion of the industrial plan changes.

Appendix A.
Detailed Movement Results for Key SH6 Intersections

Table Error! No text of specified style in document.**..1 Turning Movement Performance at SH6 / McNulty by Scenario**

			Exc Ind PC, Do Min			Exc Ind PC, RABs			Inc Ind PC, Do Min			Inc Ind PC, RABs		
Approach	Road	Movement	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
North	SH6	Left	184	2.3	A	187	2.9	A	197	2.3	A	200	3.0	A
		Thru	224	3.0	A	215	3.6	A	231	3.0	A	217	3.5	A
		Approach	408	2.7	A	402	3.3	A	428	2.7	A	417	3.2	A
East	McNulty	Left	70	28.9	D	74	2.9	A	59	46.9	E	69	3.1	A
		Right	292	50.0	E	313	3.1	A	302	68.1	F	339	3.2	A
		Approach	362	45.9	E	388	3.0	A	360	64.7	F	408	3.1	A
South	SH6	Thru	304	2.3	A	289	5.2	A	327	2.3	A	295	5.5	A
		Right	137	12.9	B	113	5.8	A	127	14.5	B	110	5.5	A
		Approach	441	5.6	A	402	5.3	A	454	5.7	A	405	5.5	A
		Intersection	1211	45.9	E	1192	3.9	A	1242	64.7	F	1230	4.0	A

Table Error! No text of specified style in document.**.2 Turning Movement Performance at SH6 / Cemetery by Scenario**

			Exc Ind PC, Do Min			Exc Ind PC, RABs			Inc Ind PC, Do Min			Inc Ind PC, RABs		
Approach	Road	Movement	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	LOS
North	SH6	Left	8	1.2	A	7	1.1	A	18	1.3	A	12	1.6	A
		Thru	273	2.2	A	271	2.1	A	261	2.3	A	259	2.3	A
		Approach	281	2.1	A	277	2.1	A	279	2.3	A	272	2.3	A
East	Cemetery	Left	66	4.8	A	62	5.4	A	72	5.2	A	64	4.0	A
		Right	40	11.6	B	21	12.8	B	65	17.6	C	35	14.5	B
		Approach	106	7.3	A	83	7.3	A	137	11.1	B	99	7.7	A
South	SH6	Thru	375	1.9	A	359	2.0	A	364	2.0	A	348	2.0	A
		Right	48	4.5	A	67	5.0	A	67	4.5	A	84	4.8	A
		Approach	423	2.2	A	426	2.4	A	430	2.4	A	432	2.5	A
		Intersection	810	7.3	A	786	7.3	A	846	11.1	B	802	7.7	A

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Minutes of Meeting

Cromwell Plan Change 18 Meeting with Waka Kotahi Minutes

Held 23 February 2023 at 2:30pm

On Microsoft Teams

Present:	Richard Shaw - Waka Kotahi	RS
	Julie McMinn – Waka Kotahi	JM
	Dave Smith – Abley	DS
	Chris Blackmore - Abley	CB
	Ann Rogers – Central Otago District Council (CODC)	AR
	Quinton Penniall – Central Otago District Council (CODC)	QP
	Marcus Brown – Beca	MB
	Matthew Hickson – Beca	MH
	Hayden Trumper – Beca	HT
Apologies:		
Distribution:	David Aldridge	DA

Item	Action
1 Introduction	
2 Modelling Comments	

2.1 General Modelling Question Raised by Beca

How was the model year 2034 selected?
Council initiated plan change – Relied on WK ITA guidance for 10 year guidance. More uncertainty in modelling the further you go out in the future beyond 10 years.

When is infrastructure indicated in the modelling report required?
This was outside of scope of this assessment. Abley/CODC acknowledge issues with McNulty Road performance and Cemetery Road safety.

What work is being done for future proofing for the proposed upgrades if growth is higher than predicted?
Abley/CODC have assumed the infrastructure will roll out in that timeframe. Modelling relied on growth forecasts provided by CODC. Project was to determine what infrastructure investment is required to accommodate plan change.

What is the feasibility of the McNulty Road roundabout as the modelling has indicated this is required?
Abley/CODC have not looked at feasibility. The modelling report has flagged that it needs upgrading. Deferred to Waka Kotahi for investigating feasibility of roundabout. There may be other opportunities at Cemetery Road that have not been investigated. Improvements may pull extra traffic through Cemetery Road.

Item	Action
It is unknown what the wider strategy is for the SH6 corridor. Speed limit review is only thing planned for the SH6 corridor. Unclear where potential McNulty Road roundabout upgrade sits on the Waka Kotahi programme. Cemetery Road has been raised previously within Waka Kotahi. *Why does the modelling show more traffic on SH6 when the plan change is excluded?* Counter factual where land is not developed with underlying assumptions around how the land would redevelop. Increased interaction between Cromwell and external areas as a people travel out of Cromwell for work. Reduced self-sufficiency of Cromwell in the base scenario. Consistent with Journey to work data. *Why is the model showing more growth in north and east compared to the south and west?* Large growth projections for residential development in Mount Pisa. Most residential development in '18-'34 growth expected north of the town centre **2.2 General discussion** Do-minimum treatment modelled of 80 km/h on SH1, ISZ at McNulty and Cemetery Road. Better performance and safety due to reduced speeds. Desire to agree do-minimum scenario for SH6 corridor between Waka Kotahi and CODC. Abley/CODC are looking for feedback on the appropriateness of 2034 baseline assessment scenario. Northbound traffic turns right at Cemetery Road without the McNulty Road roundabout. Vehicles are detouring around McNulty Road to avoid excess right turn delays The Plan Change is to progress to a hearing in June/July. Corridor is under pressure. Waka Kotahi is concerned that this is going to be a Waka Kotahi issue without ownership of the plan change from CODC. Unclear how Waka Kotahi plans to accommodate underlying growth on this corridor. Displaced growth industrial from Queenstown. Wider growth and needs wider consideration. Growth issues were initially flagged in the Spatial Plan but only starting to put numbers on it. Network is continually reviewed by Waka Kotahi.	RS/JM – to investigate if existing SH6 strategy is available
3 Safety Beca require the following information to complete their safety review: • AADT by link and/or turning movement • Any additional information regarding future intersection forms Beca suggest developing contingency plan if McNulty Road upgrade is not possible. Improvements to Cemetery Road may have wider issues that would need to be thoroughly assessed.	DS to provide Beca with AADTs

Minutes of Meeting

Item	Action
4 Next steps	
Beca team to close out safety assessment following receipt of traffic volumes	Beca
Waka Kotahi to determine what strategic work has been done for the SH6 corridor and how this plan change fits in	Waka Kotahi
Abley to provide AADT to Beca for safety assessment	Abley
5 Post Meeting Notes Additional detailed modelling questions/comments: • This the assessment is based on what could be described as a Central Otago forecast of growth to 2034. Many, if not all, of the assumptions are average or mid-range. No assessment of the impact if growth were to be greater than expected. – Suggest sensitivity test of growth rate assumptions. • In addition, the assessment of network performance is based on a 48% build-out of the Plan Change 18 and not a 100% build-out. – Suggest a scenario is investigated where the Plan Change is 100% built out. While this may not form part of the Transport Assessment for the plan change, this is likely to be informative to Waka Kotahi about future pressures on the SH6 corridor. • Why doesn't the 2034 total dwelling growth in Table 2.2 (2,360) match that in Table 2.1 (2,669)? • Why has Rural industrial growth changed so much in the revised 2034 projections? • Is using total matrix volumes of PM and IP to get interpeak industrial trip rate okay? How does this compare to and industrial specific IP trip rate?. Important for the AADT volumes being supplied to Beca. • With Plan Change 18, why are trips moved from Area 19 and Area 20 to Area 18? Why aren't they just additional?	

Minuted by: Hayden Trumper

From:	Dave Smith
To:	Hayden Trumper; Richard Shaw; Julie McMinn; Ann Rodgers; Quintin.Penniall@codc.govt.nz; Chris Blackmore
Cc:	Marcus Brown; Matthew Hickson; David Aldridge; 3814328 - Cromwell Plan Change Transport Advi
Subject:	RE: Cromwell Plan Change 18 Meeting with Waka Kotahi Minutes (23-02-23)
Date:	Thursday, 18 May 2023 9:43:16 am
Attachments:	image005.png image006.png image007.png image008.png image009.png image010.png image011.png image012.jpg Full Dev IPC Sensitivity Test LOS Comparison.xlsx

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Hi Hayden, Richard et al

An update on our PC18 modelling. As requested, we have completed a sensitivity test based on the 2034 future model year where uptake of the industrial plan change (IPC) land is 100%, rather than the reported 50%.

Landuse and Trip Distribution Summary

This landuse update requires alteration to several growth assumptions used in the modelling to date, namely:

- 100% uptake of industrial land will lead to employment supply significantly higher than forecast by the Rationale-prepared forecasts
- Preferential uptake of the greenfield IPC land will reduce the uptake of remaining land and intensification of currently zoned industrial activity compared to the baseline 2034 IPC modelling
- Increased employment supply will alter current journey to work trends compared to the baseline 2034 IPC modelling, attracting more trips from outside of the model boundary and also redirecting trips that would currently journey outside the model boundary to employment
- Household growth and distribution is unchanged from baseline 2034 IPC modelling
- Cromwell Town Centre and Wooing Tree commercial activity is unchanged from baseline 2034 IPC modelling

In the PM peak period (2hr) increasing the IPC land to 100% utilisation results in additional generation of 575 trips and additional attraction of 210 trips.
To update the trip distribution changes resulting from the additional growth the following updates were made:

1. Reduction of growth in existing zoned industrial from 10% in the baseline 2034 IPC modelling to 3%, representing the preferential shift to IPC land
    a. This industrial growth was transferred to IPC land
2. Offset increased employment supply against existing JTW trends for inbound and outbound directions
    a. Half remaining additional generation after step 1 reallocated from External – Internal to IPC – Internal, representing a decrease in JTW trips out of Cromwell in the morning peak
    b. Half remaining additional generation after step 1 allocated to IPC – External, weighted by current JTW proportions and current external volume, representing an increase in JTW to Cromwell in the morning peak
        i. Weighted proportions: Alexandra 67%, Tarras 4%, Wanaka 17% Queenstown 12%
3. Increase trips to IPC to balance increased activity, split 50/50 between External – IPC and Internal – IPC weighted by baseline trip patterns

Summary of reallocated and new trips as below for PM Peak (2hr):

	Reallocated from existing				New			
	Inbound from		Outbound to		Inbound from		Outbound to	
Step	External	Internal	External	Internal	External	Internal	External	Internal
1 Shift growth from existing industrial to IPC		40		113				
2 Employment supply change impact on JTW trends				231			231	
3 Balance inbound trips from increased activity					85	85		
Total Inbound to IPC = 210		40			85	85		
Total Outbound from IPC = 575				344			231	
Overall Reallocated Trips = 384		40		344				
Overall New Trips = 401					85	85	231	
Total Trip Change = 785		40		344	85	85	231	

The net effect of these changes is to strengthen the relationship between industrial employment and residential/ commercial activity within the Cromwell Town Centre.
This is a combination of effects from both shifting growth from the existing industrial area and reducing JTW trips seeking employment outside the model area.
An increase in commuting trips is forecast, mostly increasing Cromwell to Alexandra trips in the PM peak, due to the increased employment supply.

Results of 2034 IPC Sensitivity Test

The updated landuse trip distribution was run against the baseline 2034 IPC network with no further upgrades.
The major network infrastructure included in the baseline 2034 IPC network included upgrades to key

intersections, including:

- Single lane RAB at SH6/ McNulty
- Single lane RAB or similar treatment at McNulty/ Gair
- IPC infrastructure connections to Cemetery Rd/ Harvest Rd, Bannockburn Rd, Ree Cres/ Venning Cres
- Through link of Old Saleyard Rd connected between McNulty Rd and Cemetery Rd
- Completion of SH6/8b and SH8b/ Barry RABs as currently built

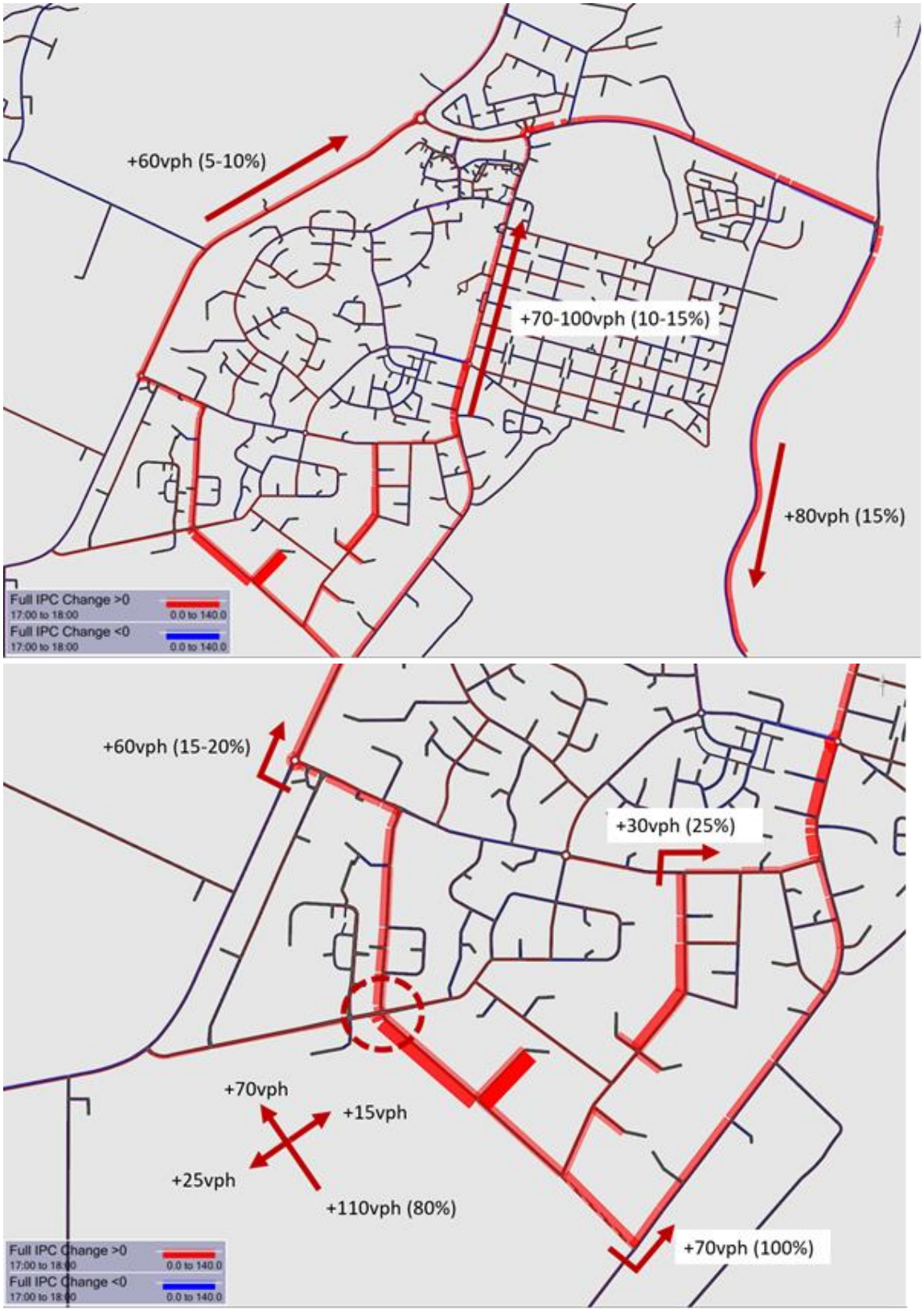
Given the network performance issues noted in the baseline 2034 IPC model reporting this sensitivity test has not been applied to the un-upgraded SH6 version.

Observation of the model in operation did not signal any notable performance issues, all traffic was able to navigate the network and no significant queues were visible.
Compared to the baseline 2034 IPC the main increases in vehicle volumes occur on the main links between the IPC area and SH6, and the IPC area and Cromwell Town Centre.
Additional volume in the PM peak hour is between 60 vehicles (SH6 NB) and 100 vehicles (Barry Ave NB). Most additional vehicles utilising Barry Ave are routing through to Alexandra, not the town centre area.

No significant increases in intersection delay were noted, with the intersections experiencing additional volumes, especially SH6/ McNulty and SH8/8b, operating within capacity.
The most notable intersections in the PM peak were:

- SH8b/ Shortcut Rd from 22s to 34s delay (LOS D)
    - This is due to increase in eastbound volumes on SH8b, as well as Shortcut Rd being used as a rat run
- SH8b/ Barry from 11s to 17s delay (LOS C)
    - Due to increase in IPC volumes, operates well through peak
- SH6/ SH8b from 22s to 25s delay (LOS C)
    - Operates well as single lane RAB, unlikely to require upgrade to dual circulating lane at this point
- SH6/ Ripponvale from 27s to 29s delay (LOS D)
    - LOS acceptable but may be worth monitoring as SH6 and Ripponvale development volumes increase
- SH6/ McNulty as a roundabout remains around 4s delay (LOS A)
    - High level of service and operates well within capacity as a single-lane RAB

The change in volume for the PM peak hour is shown below for changes on the main transport corridors (left) and movement changes from the IPC (right) compared to the baseline 2034 IPC modelling.



A summary of intersection volumes, delays and level of service compared to the baseline 2034 IPC modelling is attached.

Summary and conclusions

In summary, the sensitivity test undertaken increased the IPC development from 50% in the baseline model to 100%.

Trip distribution was updated to account for forecast changes in activity location and impact on JTW patterns. Running the updated demands against the baseline 2034 IPC network demonstrated no significant impacts on network operation, with key intersections operating within capacity through the PM peak.

The upgraded RAB at SH6/ McNulty experienced an increase of around 60vph on the McNulty to SH6 NB right turn which did not result in a significant change to overall performance, indicating that this intervention is still appropriate for the full IPC demands over the 10-year planning horizon typically assessed for plan changes.

Overall, the impact on SH6 NB is in the region of one additional vehicle each minute over and above the baseline 2034 IPC modelled volumes. It is unlikely that this change will result in a noticeable impact to people using SH6 in the peak period.

Happy to discuss as required.

Regards

Dave

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From: Hayden Trumper <Hayden.Trumper@beca.com>
Sent: Tuesday, February 28, 2023 4:59 PM
To: Richard Shaw <richard.shaw@nzta.govt.nz>; Julie McMinn <Julie.McMinn@nzta.govt.nz>; Dave Smith <dave.smith@abley.com>; Ann Rodgers <Ann.Rodgers@codc.govt.nz>; Quintin.Penniall@codc.govt.nz; Chris Blackmore <chris.blackmore@abley.com>
Cc: Marcus Brown <Marcus.Brown@beca.com>; Matthew Hickson <Matthew.Hickson@beca.com>; David Aldridge <dave.aldridge@beca.com>; 3814328 - Cromwell Plan Change Transport Advi <project-70043@workspace.beca.com>
Subject: Cromwell Plan Change 18 Meeting with Waka Kotahi Minutes (23-02-23)

[EXTERNAL]

Hi All,

It was good to get together to discuss the Modelling that Abley have undertaken for the Cromwell Plan Change 18 being progressed by Central Otago District Council. Please find attached a copy of the minutes of our discussion. Can you all please review and let me know if you have any corrections.

Dave/Chris – Our additional modelling questions and post meeting comments are provided in section 4.

Happy to discuss.

Regards,

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	100% IPC Dev Interpeak			100% IPC Dev PM Peak			IP Change from 50% IPC Dev		PM Change from 50% IPC Dev	
Intersection	Volume	Delay	LOS	Volume	Delay	LOS	Volume	Delay	Volume	Delay
SH6 / Pisa Moorings Rd / Clark Rd	975	5.9	A	1302	9.1	A	26	0.2	14	-1.0
SH6 / Lowburn Valley Rd	1085	7.4	A	1456	15.3	C	27	0.8	20	-1.1
SH6 / Burn Cottage Rd	1091	1.9	A	1458	2.4	A	27	0.0	20	-1.1
SH6 / Shortcut Rd	1109	2.1	A	1480	2.2	A	25	0.0	19	-0.1
SH6 / SH8b	1573	7.0	A	2043	24.7	C	49	0.5	72	3.0
SH6 / Ripponburn	941	3.3	A	1224	5.7	A	33	-0.4	81	-0.6
SH6 / Ripponvale Rd	953	12.0	B	1224	29.2	D	32	-0.6	84	2.2
SH6 / McNulty Rd	1003	3.8	A	1307	4.2	A	33	0.1	78	0.2
SH6 / Ord Rd	567	3.7	A	668	5.6	A	8	-0.5	-6	0.1
SH6 / Cemetery Rd	668	5.5	A	816	8.1	A	13	0.1	14	0.3
SH6 / Sandflat Rd	350	5.7	A	397	5.8	A	2	0.0	19	-0.7
SH6 / Pearson Rd / Riponvale Rd	302	5.1	A	327	5.5	A	5	0.1	13	0.3
SH8b / Sargood Rd	1007	7.6	A	1305	21.4	C	33	0.6	-2	-1.8
SH8b / Barry Ave	857	4.1	A	1214	16.7	C	29	-0.5	44	5.7
SH8b / Shortcut Rd	482	6.7	A	561	34.3	D	11	0.0	-27	12.8
SH8b / Bell Ave	423	3.3	A	474	4.4	A	14	-0.8	-17	-0.2
SH8b / Alpha St	596	4.7	A	788	17.8	C	14	0.1	-32	2.9
SH8 / SH8b	614	3.2	A	989	5.8	A	6	0.1	50	0.3
Sargood Rd / Iles St	742	4.2	A	1097	15.9	C	24	0.6	7	0.4
Barry Ave / Waenga Dr	945	4.1	A	1327	9.9	A	35	-0.1	50	0.7
Barry Ave / Neplusultra St	937	9.1	A	1315	31.6	D	33	0.4	62	0.4
Barry Ave / Molyneux Ave	897	7.4	A	1214	20.1	C	32	1.5	73	2.4
Barry Ave / Inniscort St / Gair Ave	903	3.2	A	1265	6.5	A	64	0.2	102	0.6
Gair Ave / Jollys Rd	279	3.2	A	266	5.1	A	11	-0.1	-9	0.0
McNulty Rd / Gair Ave	534	2.1	A	787	4.1	A	28	0.1	19	0.0
Barry Ave / McNulty Rd	610	3.0	A	751	12.9	B	49	0.3	63	5.4

Proposed Plan Change 18 and DOCs submission

Cromwell Chafer Beetle Context

The Cromwell Chafer Beetle Nature Reserve is an extremely rare inland dune system which provides habitat to the Cromwell chafer beetle (Threatened – nationally critical). This is the only remaining habitat for these beetles in the world and they are restricted to this site (~81 hectares). The reserve was gazetted in the 1983 and was then the only reserve in the world created to protect an invertebrate species. The Cromwell chafer beetle has the same threat classification as kakapo and fairy tern which relates to their limited available habitat and other pressures and risks to the species.

The beetles are flightless meaning their movement is restricted. They rely on the dry sandy/gravel mix of soils as the adults' burrow into the ground, and at the larval stage they also live within the soil. The adult beetle is nocturnal, meaning they typically burrow into the ground for the majority of the day and emerge late at night to feed on vegetation. Plants such as silver tussock and scabweed are food sources for the beetles at all stages of their lifecycle. While other similar habitats existed within the wider area, previous land use change through agricultural development and irrigation, subdivision, has caused loss of these areas, including development of the Clyde Dam and subsequent land inundation. Other sites within the district have been explored as options for translocation of beetles but there are limited opportunities that would provide the for all the specific habitat requirements for the beetles' survival.

Significant pressures on this species exist in part due to only a single feasible site being available. Pressures include edge effects from land use change and development of land adjacent to the reserve, predation on adults by rodents, hedgehogs, birds, and spiders, habitat disturbance and vegetation browse by rabbits, which also spread seeds in droppings. A rabbit proof fence has been in place on the boundary since 1985 (upgraded in 1088 and 1990), but this is not 100% effective.

DOC conducts regular surveys of chafer beetles, through taking multiple core samples over an approximately 1.7ha grid and counting beetle larvae in the soil. Night surveys also regularly occur. Filling of rabbit holes and culling redback spiders, as well as a regular redback spider survey are also undertaken. Captive breeding and research have also been undertaken offsite by Agresearch. The population is thought to be stable in present conditions. A considerable effort and resource are put into this site by DOC for the monitoring and preservation of this species habitat.

Issues

Effects of the proposed Plan Change 18 on the Cromwell Chafer Beetle Reserve

The Department of Conservation's concerns relate to the sensitivity of the reserve and the potential adverse effects, particularly edge effects, likely to result from the proposed zone change to industrial zoning of the adjacent land. This zoning change will allow for environmental standards set at a lower level than in the rural resource area with the ability to subdivide to smaller lot sizes, increased site coverage/development due to the nature of industrial activities, reduced boundary setbacks and an increased building height and density of develoment located closer to the boundary.

As noted in our submission, it is considered that the proposed plan change would have the following adverse effects on the reserve:

- Height of buildings and shading on the reserve and other changes to the microclimate at the boundary with the reserve. As the zone comparison below shows, there is a reduced

setback and increased height of buildings and structures allowed within the Industrial Resource Area. Tall buildings at a higher density on the northern boundary with the reserve have the potential to shade the reserve particularly in winter and shelter this northern side of the reserve from prevailing winds. These climatic changes have the potential to change the nature of the soils and ground cover due to increased soil moisture, reducing the natural drying of soils through sunshine and wind. This in turn causes changes to suitability of the soils for the beetles and reduces growth of plant species the beetle relies on for food, potentially allowing a favourable condition for weed growth, and a build-up of soil that is not preferable to the beetles. This all has the potential to cumulatively cause a significant reduction in the already limited area of useable habitat for the species.

- There are no standards within the Industrial Resource Area limiting building coverage or hard surfacing. Industrial sites can have large areas of sealed or compact surfaces for outdoor storage, such as heavy machinery. This could have an effect on the reserve due to increased surface water run-off. There is also the risk of stormwater contamination which is generally higher in Industrial zones than in other zones. Industrial businesses often also use and store hazardous substances and potentially contaminating substances.

- Increased light spill due to cumulative effects along the boundary (i.e security lighting etc). The beetles are typically active late at night. For this reason, changes in artificial lighting impacting on the reserve could also affect the normal pattern of activity of the beetles.

- Weeds and pests. There are currently no requirements in the Industrial zone rules for landscaping or screening so any undeveloped areas may not be managed or limited in terms of what is planted along the boundary. This may have the potential for an increase in management requirements for DOC at the reserve. As discussed earlier changes in the climate and soil properties due to development at the boundary could cause weed growth to increase in the edge areas and cause competition with host plants for the beetles and generally make the affected area unsuitable as a habitat.

Planning Analysis of proposed Industrial Resource Area re-zoning

The reserve is classified as a 'nature reserve' under the Reserves Act 1977 (s.20).

<u>Central Otago District Plan Maps</u>

- The reserve and adjoining sites are currently zoned 'Rural Resource Area'.
- High voltage lines run through the reserve.
- The site is identified as of Significant Natural Value (listed in Schedule 19.6.1 of the Plan SN1)
- The Council owned land to the north contains designations including D100 (Refuse Management Purposes), D101 (Amenity Planting Purposes) and D102 (Road to be stopped – Refuse Management and Amenity Planting purposes).

Proposed Plan Change to extend the Industrial Resource Area

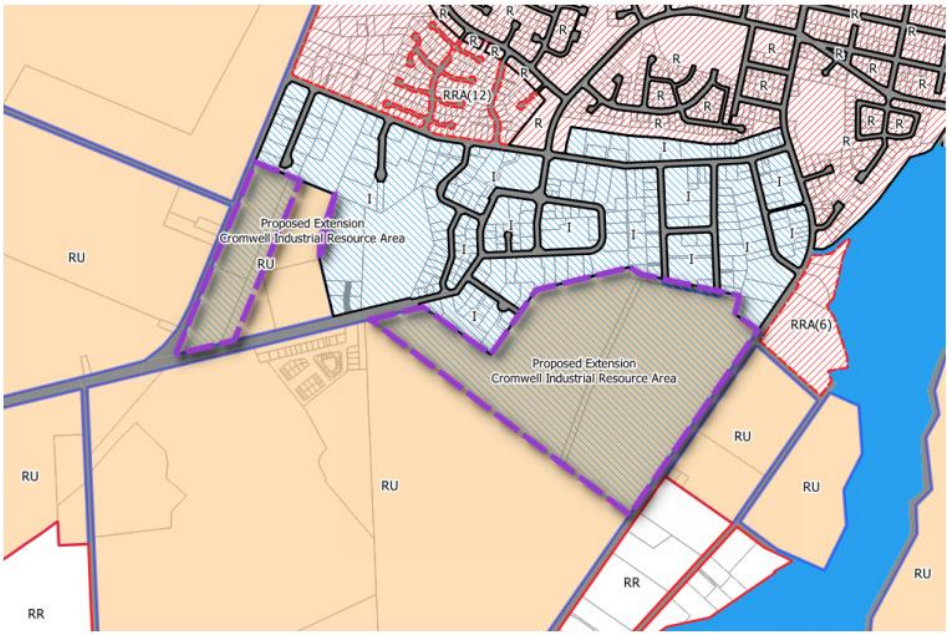


Figure 1: Proposed extension to Cromwell Industrial Resource Area

It is noted that Plan Change 18 (PC18) gives effect to the Cromwell Spatial Plan 2019 to extend the industrial area in Cromwell and meet the demand for industrial zoned land in Cromwell. PC18 makes minor amendments to the provisions in the Plan in relation to heavy vehicle access by the addition of a new performance standard applicable to the Cromwell Industrial Extension, restricting direct access onto Bannockburn Road, providing road access for light vehicles only and no direct access onto SH6. Three designations will be removed from the site if the rezoning is approved.

The Section 32 report provides the evaluation undertaken of the proposed Plan Change. The evaluation must examine whether the objectives are the most appropriate in achieving the purpose of the RMA. Although the s32 report acknowledges the location of the Chafer Beetle Reserve adjoining the proposed extension of the Industrial Resource Area there is no assessment in terms of the cross-boundary effects of the proposed plan change on the Reserve which is identified as having Significant Natural Value in the District Plan (Schedule 19.6.1). Section 75(4)(b) of the RMA requires that the district plan is not inconsistent with any regional plan matter. In this case the presence of 'Threatened' and 'At Risk' species and the rarity of their habitat within the nature reserve would classify the habitat within the nature reserve as significant against the significance criteria in the Otago Regional Policy Statement 2019 (and proposed…). Therefore Objective 3.2 and Policy 3.2.2 are a particularly relevant consideration for this plan change.

Comparison of the Rural Resource Area and Industrial Resource Area Development Standards

Development Standards	**Current Zoning: Rural Resource Area**	**Proposed Zoning: Industrial Resource Area**
Height	7.5m dwellings and 10m other buildings.	1.5m the distance from the boundary or 10m whichever is the lesser.
Side yard setbacks	25 metres residential and 10m other buildings.	5m adjoining areas of 'public open space'.
Site Coverage/Building area restrictions	N/A	N/A
Stormwater management	Controls relating to car parking in excess of 3 spaces and management of stormwater via an approved outfall or to a road channel or stormwater drain.	Controls relating to car parking in excess of 3 spaces and management of stormwater via an approved outfall or to a road channel or stormwater drain.
Open space requirements or landscaping	Restrictions within some rural areas on planting wilding pines etc but not relevant for this site.	N/A
Storage/fencing	Storage to be screened from the view of any reserve.	No requirements as doesn't adjoin Residential or Business resource areas.
Activities that can occur	Farming, horticultural/agricultural activities, intensive farming, animal boarding, rural selling activities, residential accommodation – all subject to standards.	Industrial activities, retail ancillary to industrial.
Light Controls	No more than 10 lux spill onto any adjoining property.	No more than 10 lux spill onto any adjoining property.
Storage	Must be screened from view.	No requirements as doesn't adjoin Residential or business resource areas.
Hazardous substances	Noncomplying (schedule 19.14).	N/a
Subdivision	10ha	No minimum site size so can subdivide into smaller lots.

The comparison of the development standards in the table above demonstrates that the Industrial Resource Areas are zones within which environmental standards are set at a lower level than in other resource areas. The standards provided in the zone ensure that existing amenity values are maintained, and adjoining resource areas (business and residential) are not adversely affected. However, there is no consideration or provision within the standards for cross boundary effects on the adjoining Reserve which is identified as having Significant Natural Values within the Plan.

Consideration of Options

1. Our preference is for a 25-metre buffer strip measured from the reserve site boundary to be retained as rural zone with the possibility of rezoning in the future as open space or to reclassify as reserve. To avoid creating a site with split zoning, the best option would be for the land adjoining the northern boundary of the reserve (Lots 3- 4 DP 526140) to be subdivided to remove the buffer strip from these sites. This option is preferred, given that identifying a 25m buffer area on the planning maps helps to ensure that it is protected from future development and that its primary function will not be compromised (i.e separating the adverse effects of industrial activities as described above from the reserve).

2. Alternatively, it is noted that the plan contains a 'Building Line Restriction' within the Residential Resource Area for sites adjacent to the State Highway (Rule 7.3.6.xii.c). A 20m landscaped strip is required which is shown on the planning maps. The rule specifies that the strip shall not be paved or have any structures erected on it and shall create the opportunity for visual enhancement or screening. This provides a landscaped buffer along the State Highway to assist in mitigating reverse sensitivity effects. The standards require that provision be made for the landscape strip and that the retention and future maintenance is provided for as a condition of subdivision consent that is subject to a consent notice. If this rule is breached it becomes a discretionary activity. It is recommended that a requirement for consent notices to go on the new titles adjoining the reserve stipulate the required 25 metre setback for not just buildings but storage areas, parking, landscaping standards and structures as well. Another example of requiring consent notices in the Plan is in the Rural Resource Area (5) zone. The Motorsport park subdivision to the west of the reserve also contained conditions in the decision that required the 25-meter buffer strip and other conditions i.e lighting restrictions, ground cover etc to ensure that there were no adverse effects of the development on the reserve.

SECTION 9 : INDUSTRIAL RESOURCE AREA

Note: Refer to Section 6 for Issues, Methods of Implementation, and Environmental Results Anticipated.

9.1 OBJECTIVES

The objectives contained in this section are specific to the Industrial Resource Area. The objectives contained in the following sections, particularly Section 6, are also relevant to the subdivision, use, development and protection of land in the Industrial Resource Area:

Section 3.3 (Manawhenua)
Section 6.3 (Urban Areas)
Section 12.3 (District Wide Issues)
Section 13.3 (Infrastructure, Energy and Utilities)
Section 15.3 (Financial Contributions)
Section 16.3 (Subdivision)
Section 17.3 (Hazards)

9.1.1 Objective - Protection of Amenity Values

Cross Reference
Issues 6.2.1, 6.2.8
Policies 9.2.2, 9.2.3, 9.2.4

To manage industrial activities to ensure that:

(a) Adverse effects on other land uses are avoided, remedied or mitigated, and

(b) Amenity values of neighbouring resource areas are maintained.

9.1.2 Objective - Management of the Effects of Industrial Activities

Cross Reference
Issues 6.2.1, 6.2.8
Policies 9.2.1 to 9.2.5

To manage industrial activities within the Industrial Resource Area to ensure that:

(a) A reasonable working environment for other industrial activities is maintained, and

(b) The sustainable management of network utility services including roading is promoted, while

(c) Enabling the operation of a wide range of activities.

9.2 POLICIES

The policies contained in this section are specific to the Industrial Resource Area. The policies contained in the following sections are also relevant to the subdivision, use, development and protection of land in the Industrial Resource Area:

Section 3.4 (Manawhenua)
Section 6.4 (Urban Areas)
Section 12.4 (District Wide Issues)
Section 13.4 (Infrastructure, Energy and Utilities)
Section 15.4 (Financial Contributions)
Section 16.4 (Subdivision)
Section 17.4 (Hazards)

9.2.1 **Policy - Provision for Industrial Activities**

To provide for the location of industrial activities to avoid, remedy or mitigate adverse effects on other land use activities.

Cross Reference
Objectives 9.1.1, 9.1.2
Rules 9.3.1, 9.3.~~5~~6

Explanation

Those areas that were zoned industrial under earlier planning instruments generally have a lower standard of amenity than other areas of the District due to the effects that industrial activities generate. Given that these areas already exist, it is appropriate to continue to provide for a concentration of industrial activities within these areas and to provide for future growth and expansion.

9.2.2 **Policy - Maintenance of Visual Amenity Values**

To avoid, remedy or mitigate the adverse visual appearance that some industrial areas and activities can have by:

(a) Ensuring appropriate separation and screening from adjacent resource areas.
(b) Ensuring that the bulk and location of buildings does not dominate adjacent resource areas.
(c) Reducing the visual intrusion of signs.

Cross Reference
Objectives 9.1.1, 9.1.2
Rule 9.3.~~5~~6

Explanation

While these areas have been specifically identified as Industrial Resource Areas on the basis of their existing amenity values, activities operating within these areas must be managed to ensure that they do not have an adverse visual impact on activities located in neighbouring resource areas.

9.2.3 **Policy - Adverse Effects**

To ensure industrial activities are managed so that:

(a) Waste products are disposed of adequately, and
(b) The effects of noise, odour, dust, lightspill and electrical interference on neighbouring areas are avoided, remedied or mitigated, and
(c) The community's safety and wellbeing is safeguarded from the effects of noxious or objectionable processes.

Cross Reference
Objectives 9.1.1, 9.1.2
Rule 9.3.4

Explanation

The processes involved in industrial activity often generate waste, noise, odour and the like, or contain noxious elements. Such effects must be controlled regardless of their location.

9.2.4 Policy - Maintenance of Industrial Resource Area

To ensure that activities which locate within the Industrial Resource Area that may be sensitive to lower standards of environmental quality recognise the prevailing environmental characteristics of the Industrial Resource Area.

Cross Reference
Objective 9.1.2
Rule 9.3.5~~6~~ (ii) and (iii)(b)

Explanation

The effects based regime under the Resource Management Act has the potential to create a situation where a relatively sensitive activity such as, for example, a residential activity, can locate in an area of low environmental standard such as an industrial area because it meets the minimum performance standards of the area. The sensitive activity can be adversely affected by other activities in the area even though they comply with the relevant standards. This has the potential to create conflict. Consequently it is appropriate that non-industrial activities locating within the Industrial Resource Area ensure that they are designed to incorporate measures that will mitigate any effects that may otherwise adversely affect them.

9.2.5 Policy – Infrastructure

To ensure that industrial activities avoid, remedy or mitigate adverse effects on infrastructure by:

(a) Providing appropriate access and facilities for the loading and manoeuvering of vehicles.

(b) Maintaining and enhancing the safe and efficient operation of the roading network.

(c) Contributing a fair and reasonable proportion to any upgrading or development of infrastructure that may be required as a result of the activity.

Cross Reference
Objective 9.1.2
Rule 9.3.2

Explanation

Industrial activities often need a high level of services such as water and energy. Development of such activities must ensure that services can be sustainably managed. Industrial activities can also generate high numbers of trade vehicles to their site. This can have implications for the safe and efficient operation of the roading network.

9.3 RULES

Note: In considering a resource consent application under rules in this Plan, in the absence of specific policy in this Plan the Council may have regard to other policies related to assessment matters, including relevant policies in the Regional Policy Statement for Otago, and regional plans.

See also Sections 3 and 14 – Manawhenua and Heritage Buildings, Places, Sites, Objects and Trees.

9.3.1 PERMITTED ACTIVITIES

Cross Reference
Policies 9.2.1, 9.2.2, 9.2.3

(i) Compliance with Standards

Any activity that is not listed as either a controlled, discretionary (restricted) or discretionary activity and that complies with the rules and standards set out in Sections 12 to 15 of the Plan, and the standards set out in Section 9.3.~~5~~6 is a permitted activity.

Reason

The Industrial Resource Areas are areas within which environmental standards are set at a lower level than in other resource areas. The standards set out in Section 9.3.~~5~~6.5 will ensure that existing amenity values are maintained and adjoining resource areas are not adversely affected. These standards relate to the following matters:

1. *Retail activity*
2. *Bulk and location of buildings*
3. *Noise*
4. *Screening*
5. *Signs*
6. *Off road loading*
7. *Carparking*
8. *Lightspill*

Note: Sections 12 to 15 contain a number of general rules that apply across the district. Section 12 addresses access, parking, noise, signs and lightspill. Section 13 addresses the development of infrastructure, energy production facilities and utilities while Section 14 addresses general heritage issues. Section 15 deals with matters relating to financial contributions. Section 16 that relates to subdivision and Section 17 that relates to hazards contain general provisions to complement Resource Area rules. Section 18 contains the definitions of terms used throughout this plan.

(ii) Scheduled Activities and Existing Community Facilities

Any scheduled activity identified in Clause 19.3.1 of Schedule 19.3 and identified as a scheduled activity on the planning maps and any other community facility lawfully established prior to notification of this plan is a permitted activity.

Reason

See reference at Section 1.2.9 of this Plan (page 1:12)

9.3.2 CONTROLLED ACTIVITIES

Cross Reference
Policies 9.2.1,

9.2.5

(i) Subdivision

Subdivision in the Industrial Resource Area shall be a controlled activity.

Council shall exercise its control in respect of the following matters:

1. The location, design and construction of access and its adequacy for the intended use of the subdivision.
2. Earthworks necessary to prepare the site for development, occupation and/or use.
3. Subdivisional design including the shape and arrangement of allotments to:
4. Facilitate convenient, safe and efficient access.
5. Mitigate adverse effects on adjoining resource areas, and areas of public open space.
6. With respect to unreticulated areas, the size of the allotment and its ability to effectively dispose of effluent within the site. Note: this may involve consents from the Otago Regional Council.
7. The provision of or contribution to the open space and recreational needs of the community.
8. The provision of adequate network utility services (including roading) and in particular, the location, design and construction of these services.
9. Any financial contributions necessary for the purposes set out in Section 15 of this Plan.
10. Any amalgamations and easements that are appropriate.
11. Any other matter identified in section 220 of the Act.

Note: see Section 16.7 General Standards (pg 16:14) for the standards that are likely to be imposed as conditions of consent.

Any application made under this rule will generally not be notified or require the written approval of affected persons except that where a State highway is affected the written comment of Transit New Zealand will be required.

Reason

The adverse effects of subdivision can generally be overcome by appropriate conditions and standards. Provided these are met, consent cannot be refused under controlled activity status.

(ii) Scheduled Activities and Existing Community Facilities

Any extension, upgrade or expansion that changes the character or increases the intensity or scale of the effects of a use that has status as a scheduled activity identified in Clause 19.3.1 of Schedule 19.3 and identified as a scheduled activity on the planning maps or any other community facility lawfully established prior to the notification of this plan is a controlled activity.

Council shall restrict the exercise of it's control to the following matters:

1. The provision of access, parking, loading and manoeuvering areas.
2. The size, design and location of any signs.

9.3.2(ii)
(cont'd)

3. Methods to avoid, remedy or mitigate effects on existing activities including the provisions of screening, landscaping and noise control.
4. Impact on landscape values.

Any application made under this rule will generally not be notified where the written consent of affected parties is received.

9.3.3 DISCRETIONARY (RESTRICTED) ACTIVITIES

Cross Reference
Policies 9.2.2, 9.2.5

Any activity that fails to comply with the standards set out in Rule ~~9.3.5~~6 shall be a discretionary (restricted) activity.

Council shall restrict the exercise of its discretion to the following matters:

1. The effect on the safe and efficient operation of the roading network.
2. The effect on the health, safety and convenience of people and communities.
3. The effect on amenity values of adjoining properties and adjoining resource areas.
4. The effect on network utility services.

Any application made under this rule will generally not be notified where the written approval of affected persons is received.

Reason
Failure to conform with these standards results in discretionary (restricted) activity status to enable Council to assess these activities in terms of section 105 of the Act. Council has flexibility in terms of whether to notify any application made under these rules. In some instances discretionary (restricted) activities will only have a minor effect and do not justify notification. Applicants have greater certainty in that attention can be focused upon the matters identified for consideration. This in turn will increase efficiency in processing such applications.

9.3.4 DISCRETIONARY ACTIVITIES

Cross Reference
Policies 9.2.3, 17.4.5 (pg 17:6)

Any activity that requires an offensive trade licence under the Health Act 1956 and/or any activity that requires a permit in terms of the Crown Minerals Act 1991 shall be a discretionary activity.

Reason
These activities have the potential to generate significant adverse effects that need assessment through the resource consent process.

9.3.5 *NON-COMPLYING ACTIVITIES*

Cross Reference
Policy 9.2.1; Rule 9.3.6 (ix)

(i) ***Access – Cromwell Industrial Extension***

Any activity that fails to comply with Rule 9.3.6 (ix) is a non-complying activity.

9.3.5 6 STANDARDS

Cross Reference
Policy 9.2.2

The following standards relate specifically to activities which occur within the Industrial Resource Area. There are other rules and standards contained in Sections 12, 13, 14, 15 and 16 of this plan which may also apply to activities which occur in the Industrial Resource Area.

Retail Activity

(i) Retail activity (excluding retail activity at a service station) shall be ancillary to and form an integrated and complementary part of any industrial activity and shall not occupy more than 10% of the gross floor space of the building or 50m^2, which ever is the greater.

Breach: discretionary (restricted) activity see Rule 9.3.3

Reason
Retail activity not ancillary to industry would have the potential effect of attracting large numbers of the public to these areas. The prevailing amenity values of these areas are not conducive to this type of activity. Road standards and access to these areas are not conducive to the steady flow of traffic associated with retail activities; they are generally not conveniently located, footpaths and street furniture is lacking, noise, dust and odours are often generated that are not conducive to a pleasant shopping environment, buildings are generally large and not aesthetically pleasant. Furthermore, high levels of car traffic may conflict with the manoeuvering heavy vehicles that service these areas.

Bulk and Location of Buildings

(ii) Front yards
No front yards are required

Note: See also Rule 12.7.7

Breach: discretionary (restricted) activity see Rule 9.3.3

Side and Rear Yards
Rear and side yards of 5 metres shall be provided where a site adjoins a Residential or Business Resource Area or any area of public open space, without the intervention of a road.

Height
The maximum height for buildings shall be 1.5 times the distance from the boundary of any adjacent Resource Area or 10 metres whichever is the lesser.

Reason
Council considers that yards are only necessary in the Industrial Resource Area where the site adjoins a sensitive environment such as Residential or Business Resource Area or public open space. Yard and height requirements in these circumstances will minimise adverse effects on adjoining properties.

(iii) Noise

Cross Reference
Policies 9.2.2, 9.2.4
Breach: discretionary (restricted) activity see Rule 9.3.3

(a) All activities shall be conducted so as to ensure the following noise limits are not exceeded at any point within any Industrial Resource Area,

On any day	7:00am - 10:00pm	65dBA L_{10}
	10:00pm - 7:00am the following day	45dBA L_{10}
		85dBA L_{max}

9.3.~~5~~6 **(iii)(a)** *(cont'd)*

Provided that the following noise limits shall not be exceeded at any point within the Residential Resource Area:

On any day	7:00am - 10:00pm	55dBA L_{10}
	10:00pm - 7:00am the following day	45dBA L_{10}
		70dBA L_{max}

Provided that the above noise limits shall not apply to any temporary activity (as defined).

(b) Where any new activity locates within any part of the Industrial Resource Area and that activity includes any noise sensitive activity, the activity or any building associated with the noise sensitive activity shall be sited, oriented and constructed so as to ensure that habitable spaces within the building shall be adequately isolated from any noise source on another site. Adequate sound isolation shall be achieved by siting and constructing the building to achieve an indoor design sound level of 45 dBA L_{max} within any habitable room where the exterior noise source is within any Industrial Resource Area. The indoor design level shall be achieved with windows and doors open unless adequate alternative ventilation means is provided, used, and maintained in operating order.

Reason
The noise standards selected reflect the traditional and accepted noise levels permitted in the District. It was also considered appropriate that non-industrial activities which locate in the Industrial Area should be required to take steps to mitigate the effects of any noise generated by industrial activities in the area.

(iv) Screening

Cross Reference
Policies 9.2.2, 9.2.4

Breach:
discretionary (restricted) activity see Rule 9.3.3

(a) All site boundaries adjacent to Residential or Business Resource Areas, shall have a solid fence of not less than 2 metres in height.

Such fencing shall be erected to adequately mitigate:
1. Any adverse visual effects of the site or activity.
2. Any adverse effects of noise, dust or lightspill emitted from the site.

PROVIDED THAT

a. Any fencing shall not impede visibility on roads or at access points and intersections.
b. All fencing shall be maintained, at all times, in a tidy condition.

(b) The perimeter of any open space (excluding carparking or service courts) associated with any residential activity adjacent to any industrial or trade premises shall be screened in a manner that mitigates the visual impact of any adjoining activity.

(c) On all site boundaries adjacent to State Highway 6 a landscaped strip of not less than 10 metres in width shall be provided. The strip shall not be paved or have any structures erected on it (including fences) and shall create the opportunity for landscaping to provide visual enhancement or screening. Landscaping shall not impede traffic visibility or shade State Highway 6 and shall be maintained in a healthy and tidy condition at all times. Provision shall be made for the landscaped strip on the plan of subdivision for Lot 2 DP 346988 and landscaping shall be established along the entire landscaped strip at the time of subdivision. The retention and future maintenance of the landscaping in the landscaped strip shall be provided for as a condition of subdivision consent that is to be subject to a consent notice.

***9.3.56* (iv)** *(cont'd)*

Reason
Industrial and trade premises can have adverse visual effects on the amenity values of the District. The provision of landscaping can soften the visual impact of these buildings. Council also considers it appropriate to require residential activities which locate within the industrial resource area to screen their own property from adverse visual effects of adjoining activities.

(v) Signs

Signs shall conform with the following standards:

Cross Reference
Policy 9.2.2

Breach:
discretionary (restricted) activity see Rule 9.3.3

(a) No sign shall be erected or painted on a building in a position that is higher than the road facade of that part of the building upon which the sign is placed or affixed.

(b) Any sign suspended under a verandah shall have a minimum clearance of 2.5 metres from the footpath.

(c) Signs shall have a minimum clearance of 450mm from the kerb line.

(d) Free standing signs shall comply with the following:

i) Not more than three freestanding signs shall be erected per site except as provided for in (v) and (vi) below.

ii) One double sided sign with a maximum height of 7.5 metres and a maximum area of 14m^2 per side and two smaller double sided signs with a maximum height of 2.5 metres are permitted.

iii) Signs shall be located completely within the site to which the sign relates.

iv) Notwithstanding (a) above a freestanding sign may be higher than the highest point of the roof.

v) Freestanding signs are permitted for the purpose of directing traffic within the site provided that they:

- Do not exceed 1 metre in height.
- Do not exceed 0.5m^2 in area.
- Are limited to directional arrows and "entry" or "exit" or similar technology.
- Are located completely within the site.

vi) One information sign not exceeding 2.8m^2 in area associated with any on-site carwash facility is permitted.

(e) Signs may be illuminated but shall not be moving or flashing.

(f) Signs shall not obscure driver visibility to and from access ways.

Reason
These standards will ensure the amenity values of adjoining resource areas are not adversely affected by signs associated with industrial activities.

(vi) Off Road Loading

Off road loading facilities shall be provided for each site, in accordance with Rule 12.7.3 page 12:17 provided that off road loading facilities together with access and turning space shall be designed so that it is not necessary to reverse vehicles either onto or off the following roads;

1. Boundary Road, Alexandra
2. Barry Avenue, Cromwell
3. McNulty Road, Cromwell
4. All State highways

The area and layout required shall conform with the standards contained in Figure 12.8 on page 12:32 for a 90 percentile design truck.

Reason
The provision of off road loading facilities will minimise conflict between the roading network and adjacent land uses.

Cross Reference
Policy 9.2.2

Breach:
discretionary (restricted) activity see Rule 9.3.3

(vii) Carparking

Refer to Rule 12.7.2 page 12:16.

(viii) Lightspill

Refer to Rule 12.7.6 page 12:23.

Cross Reference
Policy 9.2.2

Breach vii & viii:
discretionary (restricted) activity see Rule 9.3.3

(ix) Access – Cromwell Industrial Extension

a) Access to properties in the Cromwell Industrial Extension is to be from existing and/or future legal roads constructed in accordance with Rule 12.7.1 on page 12:13 provided that there shall be no direct property access to the following roads:

1. Banockburn Road
2. State Highway 6

Cross Reference
Policy 9.2.2

Cross Reference
Policy 9.2.1

Breach ix:
non-complying activity see Rule 9.3.5

b) Any new intersection with Bannockburn Road from the Cromwell Industrial Extension will be constructed to a standard suitable for light vehicle only.

Reason

Restricting property access will minimise the impact of heavy vehicles on the safety and efficiency of the roading network.

SECTION 12 : DISTRICT WIDE RULES AND PERFORMANCE STANDARDS

12.1 INTRODUCTION

Note: The provisions of Section 12 do not apply to activities subject to Rules 5.7.1(ii) and 13.7.4.

Section 12 addresses issues that are relevant throughout the District and to the various resource areas. The objectives, policies, methods and rules of this section deal with the following matters -

- Access
- Parking
- Loading and manoeuvering
- Noise
- Signs
- Glare
- Lightspill
- Building line restrictions
- Electrical interference
- Odour and dust
- External appearance of land and buildings
- Derelict sites, buildings and works
- Temporary activities
- Transmission Lines

12.2 ISSUES

12.2.1 Land Use Activities Adjacent to the Roading Network

Cross Reference
Objective 12.3.1

Land use activities that attract large numbers of vehicles or heavy trade vehicles, or that have direct access to main traffic routes can adversely affect the safe and efficient operation of the roading network if adequate parking, loading and manoeuvering facilities are not provided, and crossing places are not appropriately located or designed.

Explanation

The Central Otago District is dependent on a safe and efficient land transport system for its social and economic wellbeing. The safety and efficiency of this system can be compromised by activities that disrupt the flow of traffic.

12.2.2 Noise

Cross Reference
Objective 12.3.2

Noise generated by land use activities can have a detrimental effect on the health and wellbeing of the District's people and the amenity values of the District's communities.

Explanation

Noise can be a source of intrusion into the environment and can adversely effect the health and wellbeing of people.

Noise can occur from a wide variety of sources in both the rural and urban environment. Industry, transport, recreation and households can all create noise that may influence a persons wellbeing by, for example, preventing sleep, inducing stress, disturbing concentration or interfering with communication.

There are situations where it may be impracticable to reduce noise levels because of the mobile or temporary nature or the short duration of the activity or the noise generated. Such situations may include a domestic activity of relatively short duration (eg lawn mowing); seasonal rural activities (eg cropping or bird scaring); or temporary construction activities, carnivals and shows. These activities may exceed the normal noise standards for a particular area but are tolerable because of their temporary nature.

12.2.3 Signs

Cross Reference
Objective 12.3.3

Signs are a necessary adjunct to many activities that occur throughout the District. However the design, dimension and location of signs can adversely impact on the visual amenity values of the District and can compromise the safety and efficiency of the roading network.

Explanation

Signs are often an integral part of business activities as they advertise products, promote events and direct traffic to businesses. They also may have an important role in providing information to the general public, particularly in terms of safety on roads.

Poorly designed signs can detract from the appearance of neighbourhoods and can cause distraction to drivers using adjoining roads.

12.2.4 The Adverse Effects of Lightspill, Glare, Odour, Dust and Electrical Interference

Cross Reference
Objective 12.3.4

A number of activities undertaken throughout the District can generate effects such as lightspill, glare and electrical interference, and can emit dust and odour. Such effects can adversely impact on the use and enjoyment of nearby properties and can reduce the amenity values of the neighbourhood.

Explanation

Quality of life can be significantly reduced as a result of these effects. Lightspill and glare also have implications for road safety and visual amenity. While dust and odour are an emission to air (for which the Regional Council has primary responsibility) they are generally effects generated by land use activities managed by the District Council. Such effects are therefore relevant issues for Council to consider when assessing land use proposals.

12.2.5 Derelict Sites, Buildings and Works

Cross Reference
Objective 12.3.5

There are sites, buildings, structures and other works that can, when left in an untidy and/or dilapidated condition, have a significant effect on the visual amenity values of the District and also represent a public safety risk.

Explanation

The pleasantness of an area to live and work in can be greatly reduced by buildings and sites that are untidy and/or dilapidated. Unfinished works and derelict buildings can also be a potential safety risk if access is not restricted.

There are, however, some old dilapidated buildings (such as remnants of stone huts and sod huts) that add heritage character to the landscape values of the District.

12.2.6 Temporary Activities

Cross Reference
Objective 12.3.6

Temporary activities are an integral part of the social, economic and cultural wellbeing and health and safety of communities. These activities often generate adverse effects however such effects are generally only for a short duration.

Explanation

Temporary activities such as demolition, construction, prospecting and exploration activities, carnivals, shows and sports events can generate significant adverse effects such as noise and high levels of traffic. These are generally short term events and are often conducted for the benefit of the community. This needs to be recognised in the sustainable management of the District's natural and physical resources.

12.2.7 Transmission Lines

Cross Reference
Objective 12.3.7

Transmission lines that form part of the transmission network are of national significance and nearby activities need to be managed to avoid reverse sensitivity effects, to avoid compromising the operation, maintenance, upgrading and development of the transmission network and to ensure that activities that are particularly sensitive to the risks associated with transmission lines are not located in close proximity to the lines.

12.3 OBJECTIVES

12.3.1 **Objective - Safe and Efficient Roading Network**

To promote the safe and efficient operation of the District's roading network.

Cross Reference
Issue 12.2.1
Policy 12.4.1

12.3.2 **Objective - Protection from Noise**

To avoid, remedy or mitigate the adverse effects of noise on the District's amenity values and the health and wellbeing of the District's people.

Cross Reference
Issue 12.2.2
Policies 12.4.2, 12.4.3

12.3.3 **Objective - Reducing the Adverse Effects of Signs**

To avoid, remedy or mitigate the adverse effects of signs on traffic and the general amenity values of the District while recognising that signs are a necessary adjunct to many activities.

Cross Reference
Issue 12.2.3
Policies 12.4.4 to 12.4.6

12.3.4 **Objective - Avoidance, Remedying or Mitigation of Nuisances**

To ensure that activities avoid, remedy or mitigate nuisance to adjoining properties from odour, dust, lightspill, glare and electrical interference.

Cross Reference
Issue 12.2.4
Policy 12.4.7

12.3.5 **Objective - Derelict Buildings, Sites and Works**

To ensure that activities avoid, remedy or mitigate adverse visual effects and risks to public safety as a result of being incomplete or dilapidated while recognising that some ruins and old cottages have heritage significance and add value to the heritage landscape of Central Otago.

Cross Reference
Issue 12.2.5
Policy 12.4.8

12.3.6 **Objective - Temporary Activities**

To recognise the contribution that temporary activities make to the social, economic and cultural wellbeing and health and safety of the District's people and communities while ensuring environmental quality is maintained.

Cross Reference
Issue 12.2.6
Policy 12.4.9

12.3.7 **Objective – Transmission Lines**

To ensure that activities avoid reverse sensitivity effects, avoid compromising the operation, maintenance, upgrading and development of the transmission network and avoid risk to people.

Cross Reference
Issue 12.2.7
Policy 12.4.10

12.4 POLICIES

12.4.1 Policy - Parking, Loading and Manoeuvring

Cross Reference
Objective 12.3.1
Method 12.5.3
Rules 12.7.1, 12.7.2, 12.7.3

To avoid, remedy or mitigate adverse effects on the safe and efficient operation of the roading network by requiring:

(a) Safe and efficient access points to the roading network, and

(b) Off-road loading and manoeuvring space and facilities, and

(c) Off-street parking,

where these are appropriate.

Explanation

Numerous activities involve loading and unloading during the normal course of business. The safe and efficient flow of traffic can be interrupted where loading and unloading takes place on the road, where access, loading and parking facilities are not correctly designed or where vehicles reverse onto the road. Developments that attract high levels of traffic can also compromise the safety and efficiency of the roading system by increasing pressure on parking facilities.

12.4.2 Policy – Noise

Cross Reference
Objective 12.3.2
Method 12.5.2
Rule 12.7.4
Rules throughout Resource Areas

To determine the suitability of noise generating activities in any given locality by having regard to:

(a) The specific characteristics and amenity values of the locality from which the noise originates, and

(b) The sound pressure level of the proposed activity, and

(c) The frequency that the noisy activity takes place, and

(d) The length of time that the noise continues, and

(e) Any special characteristics of the noise,

to ensure that the adverse effects of noise on other activities and the natural and physical resources of the locality (including cumulative effects) reflect standards acceptable to the community.

Explanation

All activities generate some degree of noise. High levels of noise can be detrimental to the health and wellbeing of the community and can adversely affect quality of life. The standards set throughout the District recognise this by ensuring relatively quiet areas are protected and that activities that generate high levels of noise locate away from noise sensitive areas and activities.

12.4.3 Policy - Noise From Temporary Activities

Cross Reference
Objective 12.3.2
Method 12.5.2
Rule 12.7.4(ii) & (iii)

To recognise that noise from temporary activities can be reasonably controlled by requiring compliance with noise limits which are less stringent than those applied to other activities.

Explanation

Noise associated with temporary activities such as demolition or construction activities, prospecting and exploration activities, carnivals or shows is considered to be a short term phenomenon. While noise associated with these activities can sometimes be reasonably loud it is generally sporadic and of short duration.

12.4.4 Policy – Signs

Cross Reference

To determine the suitability of signs in any given location by having regard to the sign's effect on the following matters:

(a) The safe and efficient operation of the roading network, and

(b) The amenities of the locality, and

(c) Landscape values, and

(d) The character and scale of the building, site or area, and

(e) Any heritage, historical or cultural values present.

Objective 12.3.3
Method 12.5.1
Rules 12.7.5
Rules throughout Resource Areas

Explanation

Signs generally have one or more of the following functions -

- Advertise goods and services.
- Identify the location of an activity.
- Promoting an activity or event.
- Directing traffic or customers to an activity.

While these functions need to be recognised and provided for, the erection of signs must be managed to ensure that amenity values and the safe and efficient operation of the roading network are not compromised.

12.4.5 Policy – Temporary Signs

To enable the use of temporary signs in association with temporary activities while ensuring the dimension, location and the duration of display of such signs avoid, remedy or mitigate adverse effects on amenity values and the safe and efficient operation of the roading network.

Cross Reference
Objective 12.3.3
Rule 12.7.5(i)

Explanation

Signs are often an important element of temporary or short duration activities such as selling real estate or promoting a forthcoming election or other community event. However, such signs can also detract from amenity values and affect traffic safety, making standards relating to such signs necessary.

12.4.6 Policy - Public Safety and Information Signs

To enable the display of signs necessary for reasons of public safety and information within the District.

Cross Reference
Objective 12.3.3
Rule 12.7.5(i)

Explanation

There are numerous situations where it is necessary for the display of warning or safety information signs. These can include warning signs for traffic, for overhead or underground wires, boating safety, and information about areas of interest to the public.

12.4.7 Policy - Management of Nuisance Effects

To encourage resource users to adopt management practices that avoid, remedy or mitigate the adverse effects of:

(a) odour,

(b) lightspill and glare,

(c) dust, and

(d) electrical interference,

on the use and enjoyment of neighbouring properties.

Cross Reference
Objective 12.3.4
Methods 12.5.5, 12.5.4
Rules 12.7.6

Explanation
These effects have potential to create a nuisance problem for adjoining properties if not managed correctly. Dust and odour emissions may also be subject to Regional Council controls.

12.4.8 Policy – Derelict Sites and Buildings

Cross Reference
Objective 12.3.5
Method 12.5.6

To ensure that measures are taken to avoid, remedy or mitigate any significant adverse effects on public safety and amenity values that may occur when sites, works and buildings are left unfinished or dilapidated, while allowing the retention of ruins, artefacts and old cottages that form part of the heritage landscape of Central Otago.

Explanation
Untidy sites, buildings or works and buildings and sites that are dilapidated or unfinished have a negative impact on environmental quality (particularly in terms of the visual amenity values of neighbourhoods) and can be a risk to public safety if access is not restricted. This policy will ensure action is taken to prevent or remedy such occurrences while recognising the heritage and landscape values of the remnants of old cob and stone cottages and of artefacts such as gold workings and equipment that are part of the heritage fabric of Central Otago.

12.4.9 Policy - Temporary Activities

Cross Reference
Objective 12.3.6
Rules 12.7.4(iii), 12.7.5(i)
Rules throughout Resource Areas

To enable the operation of temporary activities that promote the social, economic and cultural wellbeing, and health and safety of the District's people and communities while ensuring that any adverse effects that exceed performance standards of the District Plan are of a short duration only.

Explanation
This policy recognises the importance of temporary activities to the wellbeing and functioning of communities. However, it is acknowledged that these activities may not always comply with the relevant performance standards of the plan. Requiring resource consent for such activities is considered overly restrictive provided adverse effects are of short duration only, with no lasting impact.

12.4.10 Policy – Transmission Lines

Cross Reference
Rule 12.7.8 & Rule 4.7.6A(g)

The transmission network is of national significance and nearby activities are therefore to be managed to avoid adverse effects in terms of reverse sensitivity, in terms of compromising the operation, maintenance, upgrading and development of the transmission network and in terms of ensuring that activities that are particularly sensitive to the risks associated with transmission lines are not located in close proximity to those lines.

Explanation
This policy is consistent with Policies 10 and 11 of the National Policy Statement on Electricity Transmission (NPSET) which came into effect on 10 April 2008.

12.5 METHODS OF IMPLEMENTATION

12.5.1 Promotion of Guidelines for Signs

Cross Reference
Policy 12.4.4
Rules in Resource Area

In order to maintain and enhance the amenity values of the District particularly within Business or Industrial Resource Areas, Council encourages the use of the following guidelines when erecting signs:

- Signs should be designed and finished in colours that are appropriate to the scale and architecture of the buildings to which they are affixed, and to their adjoining streetscape.

- Signs should not be placed on the decorative forms or mouldings of buildings, dominate facades or conceal windows or architectural features.

- Where possible and practical, signs on adjacent buildings should be coordinated, particularly in regard to alignment.

- Signs should not project above parapet lines or be constructed so as to obscure views of landforms or buildings which contribute to the amenity values of the local environment.

The following questions should be asked:

1. Do you need a sign?
2. Does the sign:
    - Conform to the desired environmental outcomes for the resource area?
    - Complement the character of the landscape?
    - Complement the character and scale of the building, site or area?
    - Rationalise or reduce the number of existing signs?
    - Adversely affect traffic safety?

The following design factors should be considered. These include the:

- Number of existing signs on the site subject to application.
- Placement (ie. visibility).
- Dimensions, scale, shape and colour, including lettering size.
- Materials, construction details (eg means of attachment).
- Purpose of sign (ie. identification, directional, general advertising).
- Concise messages.
- Conflict or confusion with official signs.
- Reflectivity.
- Means of illumination.
- Provision of services, such as electricity, to the sign.
- Durability.
- Maintenance requirements.

Reason

It is not appropriate to be overly restrictive in respect of signs in Business or Industrial Resource Areas. It is recognised, however, that signs can have a significant impact on the cohesiveness and

attractiveness of the District's urban areas. It is intended that these guidelines will assist people in maintaining and enhancing the amenity values of the urban areas. The Council will give consideration to preparing a pamphlet on design guidelines for signs in the future.

12.5.2 Noise – General Responsibilities

Cross Reference
Policies 12.4.2, 12.4.3

Every occupier of land and every person carrying out an activity on land or water, is required by the Act to adopt the best practicable option to ensure emission of noise from that activity does not exceed a reasonable level.

Where Council is of the opinion that there is excessive noise in terms of sections 326 and 327 of the Act, Council may exercise the powers available under those sections.

Reason

Section 16 of the Act imposes a duty on people to avoid creating unreasonable noise. It is appropriate to note the provisions of sections 16, 326 and 327 of the Act in the plan to draw attention to all persons' responsibilities in terms of noise generation.

12.5.3 Classification of the Roading Network

Cross Reference
Policy 12.4.1

Schedule 19.7 identifies the roading classification adopted in the plan. Access standards to public roads will be determined by the classification of roads.

Reason

The adoption of a roading classification will assist resource users and the Council in assessing the impact that an activity may have on the safe and efficient operation of the roading network. Road classification also determines the appropriate standard of construction for an access in terms of Rule 12.7.1.

12.5.4 Electrical Interference

Cross Reference
Policy 12.4.7

All resource users are expected to manage and control their activities to ensure that there is no discernible electrical interference with radio, TV, telecommunication signals, or any other electronic equipment.

Electrical interference is subject to the Radio Communications Act 1989, the Radio Communications (Radio) Regulations 1993 and the Radio Communications Interference Notice 1993. This legislation is administered by the Communications Division of the Ministry of Commerce and approvals may be required from this body in respect of activities that may generate electrical interference. Where electrical interference is occurring discussion between affected parties, abatement notice procedures (section 322 of the Act) or enforcement order provisions (section 314 of the Act) may be utilised to stop or control adverse effects of the activity.

Reason

Electrical interference with electronic equipment is a nuisance that can be avoided by the use of proper equipment and appropriate maintenance.

12.5.5 Odour and Dust

Cross Reference

Policy 12.4.7

Resource users are expected to manage and control their activities to keep dust generation to a minimum (having regard to the particular operational requirements or characteristics of the activity) and to adopt the best practicable option in respect of odour being discernible beyond the boundaries of the site.

It should be noted that activities that emit odour and dust may require resource consent from the Otago Regional Council. The District Council also has the ability to utilise the abatement (section 322) and enforcement (section 314) provisions of the Act and the provisions of the Health Act where odour is or becomes a nuisance.

Odour and dust emissions may also be subject to control through conditions of resource consents.

Reason
Odour and dust can adversely affect the use and enjoyment of neighbouring properties. Those who create odour or dust should be responsible for avoiding, remedying or mitigating such effects.

12.5.6 External Appearance of Land and Buildings

Cross Reference
Policy 12.4.8

(a) In carrying out any activity permitted under this plan, or by a resource consent granted under this plan, persons are expected to ensure that:

(i) No structure, sign, excavation, storage of materials, or other works,
or
(ii) No land or activity ancillary to the use of the site,

is left without significant physical progress towards completion of the work, or allowed to become dilapidated or be allowed to deteriorate to such a condition that would detract from the visual amenity values of the neighbourhood it is located in or have an adverse effect on the environment. This method will not normally apply to remnants of old cob and stone cottages, ruins, gold workings and heritage artefacts that have heritage landscape values.

Where any building, operation or storage of material does fall into disrepair or is adversely affecting the environment (which includes amenity values) the Council may utilise its powers to issue an abatement notice pursuant to section 322 of the Act which can require a person to cease an activity or do something to remedy the situation.

(b) Glare from buildings.
Resource users should ensure that no buildings are constructed, and/or left unfinished, and/or clad in any protective material or cover which could reflect sufficient light to detract from the amenities of the neighbourhood, cause significant discomfort to residents in the locality or detract from traffic safety.

Reason
The external appearance of buildings and sites can have a significant effect on amenity values but is a difficult area to regulate

with rules. This method highlights the issue and identifies it as a matter which may be subject to Council utilising the enforcement provisions of the Act. It should be noted that what is likely to have an adverse effect on the environment may be a matter for the Enforcement Officer to determine. (See section 322 of the Act).

12.5.7 Rules

To develop rules to maintain and enhance amenity values and to avoid, remedy or mitigate the adverse effects of activities on the environment.

Cross Reference
Policies 12.4.1 to 12.4.7

Reason

A wide range of methods have been considered to address the issues identified in this section including education and guidelines. In some instances the adverse effects of activities are such that some form of direct control is needed. Rules are the appropriate option in these situations as they are the only methods that can be readily enforced.

12.6 PRINCIPAL REASONS FOR ADOPTING OBJECTIVES, POLICIES AND METHODS

The issues addressed in Section 12 of this plan have implications in respect of the following:

- Safety and efficiency of the roading network.
- Health and wellbeing of people and communities.
- Visual amenity values of the District.
- Environmental quality of communities.

The objectives, policies and methods contained within this section are adopted to ensure that adverse effects on these values are avoided, remedied, or mitigated. They also give clear guidance to resource users as to what is required when undertaking land use activities within the District.

12.7 RULES

Note: In considering a resource consent application under rules in this Plan, in the absence of specific policy in this Plan the Council may have regard to other policies related to assessment matters, including relevant policies in the Regional Policy Statement for Otago, and regional plans.

Any activity or development undertaken within the District (excluding those subject to Rules 5.7.1(ii) and 13.7.4) must comply with rules contained in Section 12 as well as the rules that apply to each specific resource area.

12.7.1 ACCESS STANDARDS FROM ROADS

Cross Reference
Policy 12.4.1

Access to and from roads is a permitted activity provided it is in accordance with the following standards:

(i) Construction and Maintenance

All vehicular accesses from a road shall be designed, constructed and maintained to ensure that:

1. They are able to be used in all weather conditions.
2. They have no adverse impact upon road drainage systems.
3. Stormwater and detritus (including gravel and silt) do not migrate on to the road.
4. They intersect with the property boundary within 15 degrees of a right angle.

Note: Transit New Zealand has control of access to Limited Access Roads that are State highways. Design and construction of access to State highways must be in accordance with Transit New Zealand standards.

(ii) Sight distances

Clear visibility along the road in both directions from intersections and vehicular access shall comply with Table 12.1.

Table 12.1 Sight Distances (Source "Guidelines for Visibility at Driveways "Land Transport Safety Authority - Publication No. 6 and Transit New Zealand Planning Policy Manual Appendix 4B" : [Rounded]). See also Figure 12.1 (page 12:31).

Minimum Sight Distance from Access/Intersection			
Speed Limit or 85th Percentile Speed	Sight Distance (m) per road classification		
Speed (km/h)	Rural & Urban Local Roads	Rural Collector Road	Rural & Urban State highways and Arterial Roads
50	40	45	110
60	55	65	140
70	85	85	170
80	105	105	200
100	160	160	280

Note: See Schedule 19.7 for Roading Classification

(iii) Access to Rural State highways and Arterial Roads **12.7.1** *(cont'd)*

See Schedule 19.7

In addition to the requirements of (i) and (ii) above design and construction of access to rural State highways and arterial roads shall comply with the following standards:

(a) The access shall be sealed to the same standard as the adjacent road carriageway.

(b) Where the speed limit is 100 kph, spacing between accesses shall be not less than 200 metres (regardless of the side of road on which they are located), and no vehicle access shall be constructed within 100 metres of road intersections AND spacing between intersections (ie road intersections) shall be not less than 800 metres.

(c) Except as provided for in (d) below, width of vehicular access ways at the property boundary are to be no greater than 6 metres.

(d) Heavy vehicular accesses shall be designed and constructed to:

i) A minimum width of nine metres.

ii) Carry the volume and weight of traffic likely to use the access.

iii) Ensure heavy vehicles do not have to cross the road centre line when making a left turn.

iv) Ensure the surface is constructed to the same standard as the adjacent road carriageway.

v) Have sufficient width to accommodate the swept path of the largest vehicle anticipated to use it.

(e) Driveways shall not be parallel to and level with roads within 20 metres of the road reserve.

(f) Figures 12.2 and 12.3 on pages 12:32 and 12:33 establish the minimum design standards for access determined by activity type.

(g) Access to State highways shall be to Transit New Zealand design specifications.

(iv) Access to Rural Collector Roads

See Schedule 19.7

In addition to the requirements of (i) and (ii) above, the design and construction of access to rural collector roads shall comply with the following standards:

(a) Access for residential activities shall conform with the standards set out in Figure 12.4 on page 12:34.

(b) Access for non-residential activities shall conform with the standards set out in Figure 12.5 on page 12:34.

(c) Access distance from any road intersection for activities that attract a low level of vehicles (30 or less vehicle movements equivalent per day) shall be not less than 30 metres.

(d) Access distance from any road intersection for activities that attract a high level of vehicles (more than 30 vehicle movements equivalent per day) shall be not less than 60 metres.

(v) Access to Rural Local Roads

In addition to the requirements of (i) and (ii) above, design and construction of access to rural local roads shall comply with the following:

(a) Access distance from any road intersection for activities that **12.7.1(v)**

(cont'd)

attract a low level of traffic (30 or less vehicle movements equivalent per day) shall be not less than 30 metres.

(b) Access distance from any road intersection for activities that attract a high level of traffic (more than 30 vehicle movements equivalent per day) shall be not less than 60 metres.

(vi) Access to Urban State highways and Urban Arterial Roads

See Schedule 19.7

In addition to the requirements of (i) and (ii) above, design and construction of access to urban State highways and urban arterial roads shall comply with the following standards:

(a) The access shall be sealed to the same standard as the adjacent road carriageway.

(b) The vehicle crossing shall intersect with the road reserve boundary at an angle between 45 degrees and 90 degrees.

(c) For activities that attract a low level of vehicles (30 or less vehicle movements equivalent per day) the width of the crossing measured at the property boundary shall not be greater than 3.5 metres.

(d) For activities that attract a high level of vehicles (more than 30 vehicle movements equivalent per day) the width of the crossing measured at the property boundary shall be as follows:

- between 3.5 and 6.0 for a one way operation or
- between 6.0 and 9.0 metres for a two way operation.

(e) No access for residential activities shall be constructed within 7.5 metres of the road reserve boundary of a road intersection.

(f) Access shall be constructed in accordance with the standards set out in Figure 12.6 on page 12:35.

(vii) Access to Urban Local Roads

In addition to the requirements of (i) and (ii) above, design and construction of access to urban local roads shall comply with the following:

(a) The access shall be sealed where the adjacent road carriageway is sealed.

(b) The access distance from any intersection with an urban State highway or arterial roads shall be not less than a minimum of 15 metres.

(viii) Breach of Standards

Any activity that does not comply with the standards stated in Rule 12.7.1(i)-(vii) shall be considered as a discretionary (restricted) activity.

Council shall restrict the exercise of discretion to the safe and efficient operation of the affected road, having regard to:

(a) The intensity and duration of the activity.

(b) The classification and use of the road.

Unless Council determines otherwise on the basis of safety concerns, written consent of affected parties need not be received and applications may not be notified. However, where the activity affects a State highway, Transit New Zealand's written approval will be required in order for an application to not be notified.

Reason

12.7.1(vii)

Development alongside of the roading network may reduce the safety and efficiency levels of the road. Performance standards have been developed by Transit NZ and the Land Transport Safety Authority to ensure safety and efficiency levels are not compromised. These standards have been used as the basis for control, although in some instances they have been modified to suit local conditions. Refer to "Planning for a Safe and Efficient State Highway Network Under the Resource Management Act 1991" Transit NZ, 1994.

(cont'd)

12.7.2 PARKING

(i) Every activity shall make sufficient provision for vehicular parking in accordance with Table 12.3 (page 12:30) and the minimum dimensions stated in Figures 12.7 and 12.8 on pages 12:36 and 12:37 other than on roads provided that in the Business Resource Area no on-site parking is required except where the gross floor area of any building is 300m^2 or more. Vehicles shall not be required to undertake more than one reverse manoeuvre when manoeuvring out of any parking space to depart the site.

Cross Reference
Policy 12.4.1

(ii) Construction of parking areas to accommodate in excess of 3 carspaces including vehicle access and turning spaces, shall be constructed in accordance with the following standards;

(a) Parking areas shall be formed and sealed or otherwise constructed, so as not to create a dust nuisance or permit vehicles to carry deleterious materials such as mud, stone, chip or gravel onto the road or footpath.

(b) Stormwater originating from the parking areas shall be disposed of to an approved outfall either within the confines of the site or by pipe (of adequate diameter given the size of the parking area), to a road channel or stormwater drain.

(c) Traffic safety is to be ensured by:

1. Vehicles using the parking area being prevented from entering or leaving the site except by the vehicle access and crossing provided.
2. The parking area and turning spaces shall be laid out with sufficient manoeuvring space so that access can be obtained to the required parking space without the necessity for reversing onto or off the site.
3. Any part of the parking area which cannot be used for the parking shall be landscaped.

(d) Privacy of neighbours is to be protected by ensuring that where the parking area adjoins a residential property, a solid fence, no less than 1.5 metres in height, shall be erected and maintained by the developing owner provided that the height of the fence shall be reduced at access points to enable adequate visibility on adjoining roads.

12.7.2(ii)
(cont'd)

(e) Queuing space is to be provided within the site for vehicles entering or leaving a private or public carpark on the following basis:
   1. No less than 6 metres length in both directions for carparks of 20-100 car capacity.
   2. No less than 15 metres length in both directions for carparks of greater than 100 car capacity.

(f) Any lighting associated with the parking area shall be directed to avoid adverse effects on adjoining properties or roads.

(g) All areas of carparking in excess of 100m^2 shall provide a strip of not less than 1.5 metres in width adjacent to any boundary that is not built up to except where a solid fence has been erected.

(h) The strip referred to in (g) shall not be paved and shall create the opportunity for landscaping to provide visual enhancement or screening. Landscaping shall not impede traffic visibility and shall be maintained in a healthy and tidy condition at all times.

(iii) Breach of Standard

Any activity that does not comply with the standards stated in Rules 12.7.2(i) and (ii), and Table 12.3, will be considered as a discretionary (restricted) activity.

Council shall restrict the exercise of its discretion to the effect on the adjoining roading network, the effect on any heritage values of the site, or the area, and the amenity values of the neighbourhood.

In granting any resource consent Council may require a cash contribution in lieu of the provision for vehicular parking which will be determined on the basis of the actual cost of developing the required amount of parking required by Table 12.3 (including the cost of purchasing the land).

Reason
Large scale developments tend to attract a high number of visitors and/or employ a large number of people thereby increasing pressure on parking in the neighbourhood. To reduce the impact on the safety and efficiency of the roading network, off-street parking facilities of an appropriate standard are required.

12.7.3 LOADING AND MANOEUVRING

Cross Reference
Policy 12.4.1

(i) Servicing Activities

Where the loading and unloading of goods is an integral part of an activity, loading facilities are to be provided.

All such loading areas shall be so located that no vehicle or machinery engaged in any loading or unloading operation shall stand on or be required to manoeuvre on any part of the formed road or cause vehicles to reverse onto State highways or any other road nominated in the rules that apply to a particular Resource Area.

Design shall be appropriate to the type of vehicles that have occasion to visit the site.

(ii) Breach of Standard **12.7.3** *(cont'd)*

Any activity that does not comply with the standards stated in Rule 12.7.3(i) will be considered as a discretionary (restricted) activity.

Council shall restrict the exercise of its discretion to:

(a) The safe and efficient operation of the adjoining road having regard to:
   1. The configuration of the site.
   2. The size and intensity of the activity.
   3. The classification of the road and the use of the road.

(b) The effect on amenity values of adjoining properties.

Any application for resource consent under this rule shall generally be considered without notification or the written consent of affected people, provided that where a State highway is affected the written approval of Transit New Zealand is required.

Reason

The loading and manoeuvring of vehicles can have a major impact on the safety and efficiency of the roading network, and it is therefore imperative that loading activities are controlled on busy and important roads.

12.7.4 NOISE

Cross Reference
Policies 12.4.2, 12.4.3

(i) Measurement and Assessment of Noise

Except where expressly provided elsewhere in this Plan, noise shall be measured in accordance with the provisions of NZS 6801:1991 *Measurement of Sound* and assessed in accordance with the provisions of NZS 6802:1991 *Assessment of Environmental Sound*. For the purposes of this Plan the following additional provisions shall limit the application of NZS 6802:1991.

(a) Adjustments for special audible characteristics, if present, as provided for in clause 4.3 and 4.4 of the Standard, shall apply and will have the effect of imposing a numerical noise limit 5 dB more stringent that those L_{10} numerical limits stated in the plan.

(b) Where measured noise levels are averaged as provided for in Clause 4.5 of the Standard, the L_{10} value shall be determined by an energy average (inverse logarithmic mean) of any four L_{10} measurement sample time intervals on the same day. Sample time intervals must include the sound of interest. The total measurement period should be representative of any variations in the character and range of sound levels for the noise of interest during any period of concern. Such a period may relate to a specific time of day when a noise is alleged to be a problem, or to a particular type of noise source. The total time interval over which measurements for the purpose of determining an average sound level are made shall not exceed four consecutive hours in any 24 hour period including night-time.

(c) Measurement time intervals as provided for in Clause 5.1 of **12.7.4(i)**

the Standard shall be limited to 10-15 minutes excluding pause times. For steady noise received at a particular location, a period of two hours will usually be adequate if compliance monitoring is the purpose. Where the noise of interest is cyclic or occurs for time intervals less than 15 minutes in duration, the sample intervals may be less than 10-15 minutes excluding pause times and an average level shall be determined by the method described in (b) but at least ten events should be measured.

(cont'd)

Reason
Recognised noise assessment and measurement techniques are to be used to ensure that consistency and certainty is achieved.

(ii) Construction Noise

Construction noise within the district which is ancillary to the principal use of the site shall not exceed the recommended limits in and shall be measured and assessed in accordance with the provisions of NZS 6803P:1984 *The Measurement and Assessment of Noise from Construction, Maintenance, and Demolition Work.* Discretionary adjustments provided in Clause 6.1 shall be mandatory within the district.

Construction noise is permitted to occur only between the hours of 7:00am and 6:00pm within an urban area (as defined on page 18:11).

Any activity that does not comply with this rule shall be considered as a discretionary (restricted) activity. Council shall restrict the exercise of its discretion to the effect on the amenity values of the neighbourhood.

Reason
Construction site noise is often thought of as only a temporary inconvenience although major developments may take several years. Council considers that existing New Zealand Standards are adequate to control this activity. The abatement procedures for excessive noise are available where such noise creates a significant environmental problem.

(iii) Exemptions

Noise limits in any part of the plan shall not apply:

(i) In any area to activities of a limited duration necessary for the production (but not processing) of primary products.

(ii) In any part of the district where the noise source is a warning device used by emergency services.

(iii) In any Residential Resource Area to activities of a normal domestic nature including recreational activities, such as sporting events, that do not involve powered motorsport, powered aviation, gunfire or amplified music.

(iv) Where a carnival, show, display, field-day or exhibition with a duration less than five days occurs no more than four times

12.7.4(iii)
(cont'd)

in any period of a year.

(v) To other temporary activities.

(vi) To temporary military training activities provided the following rules are complied with:

(a) Temporary military training activity shall be conducted so as to ensure the following noise limits in Table 12.1A below are not exceeded at any point within the notional boundary of any dwelling, residential institution, or educational facility within the district.

Table 12.1A Noise Limits for Temporary Military Training Activities

Time on any day	$L_{eq\ (15\ min)}$ dBA	L_{max} dBA
0600-0730	60	70
0730-1800	75	90
1800-2000	70	85
2000-0600 the following day	55	75

(b) Provided the limits for impulsive noise arising from any use of explosives ammunition, or pyrotechnics at any time, shall not exceed 122 dBC (peak).

(c) Provided also that the above noise limits shall not apply on up to two occasions in any period of 12 months where any exhibition or demonstration of military activities is open to the public and held between the hours of 10.00 am and 5.00 pm.

(iv) Blasting

(a) Vibration from any site due to blasting shall not exceed a peak particle velocity of 5mm/sec measured in the frequency range 3-12 Hz measured at any point within the notional boundary of any dwelling, residential institution or educational facility.

(b) Airblast overpressure from blasting on any land or in water shall not exceed a peak sound pressure level of 115 dBC measured at any point within the notional boundary of any dwelling, residential institution or educational facility.

Reason

Noise associated with temporary activities such as demolition or construction activities, carnivals, or shows are considered a short term phenomenon. While noise associated with these activities can sometimes be reasonably loud, it is generally sporadic and of short duration. Because of the short term nature of temporary activities, Council considers it overly restrictive to require applications for resource consent where the noise standards of the Resource Areas are not met. Furthermore, these activities are often conducted for the benefit of the community.

Council also notes section 16 of the Act which imposes a general duty on people to avoid creating unreasonable levels of noise.

12.7.4(iv) *(cont'd)*

12.7.5 SIGNS

Cross Reference
Policies 12.4.4 to 12.4.6

(i) Permitted Signs Throughout the District

The following signs are a permitted activity throughout the District, and are not subject to Rule 12.7.5(v) (Standards and Conditions).

(a) A sign not exceeding 1.1m² in area advertising the disposal of an individual allotment of land or premises on which it is located.

(b) A sign not exceeding 3m² in area erected on a construction site for which a building consent has been issued or for a property development involving the sale of several allotments or premises. No such sign shall be displayed for a period exceeding the duration of the construction or sale period, and shall include only details of the project and the names of parties connected therewith.

(c) Any sign erected to direct, control or warn traffic with its dimensions specified by Regulations, or any sign not exceeding 0.5m² in area serving to denote the name of the street, the number or name of the premises, or indicating the location or timetable or other details of any public utility or facility.

(d) Any sign erected to display public safety information or to warn the public of the existence of a hazard provided the sign is no larger than is necessary to adequately convey such information.

(e) A sign not exceeding 2m² in area erected on land held or managed under the Conservation Act 1987 or any of the Acts referred in the First Schedule of that Act which provides information about the land upon which it is erected.

(f) A sign advising of forthcoming cultural, religious, educational, sporting events or other temporary activities provided such signs:

1. Are not erected earlier than 3 months before the event.
2. Do not exceed 3m² in area.
3. Are not located on road reserve without the written consent of the Chief Executive.
4. Are removed within 7 days of the event finishing.

(g) Any finger board type sign or information sign of an interpretive and public information nature not exceeding an area of 0.5m² where such finger board type sign serves to direct traffic to activities and attractions of interest to residents and visitors. Such finger board signs are to be located within the legal road and shall be subject to approval of the agency responsible for the road.

(h) A sign displayed for electioneering purposes provided such signs:

1. Are not erected earlier than 2 months before polling day.
2. Do not exceed 3m² in area.
3. Are not located on road reserve without the written consent of the Chief Executive.
4. Are removed by the close of the day before polling day.
5. Have spacing between any lines of text of not less than 50mm.

12.7.5(i)
(cont'd)

Note: The erection of any sign on any part of a State highway is subject to a Transit New Zealand Bylaw outside 50 km per hour speed restricted areas.

Reason
Temporary signs advertising the sale of property or a construction site can only serve their purpose if located on the property to which they relate. A restriction on the size of such signs will mitigate any adverse effects arising from their erection. Signs directing traffic, identifying public facilities or providing information on hazards are considered essential for public information purposes.

(ii) "Welcome" Signs

A "Welcome To" or tourist information sign is a discretionary (restricted) activity throughout the District.

Council shall restrict the exercise of its discretion to the design, location and size of signs.

Written consent of affected persons and notification of the application will generally not be required.

Reason
The above signs have been given "discretionary (restricted) activity" status to enable Council to have control over the location, design and size of such signs. Notification will only be required where it is appropriate to have public input.

(iii) Hoardings

A hoarding (as defined on page 18:5) is a non-complying activity throughout the District.

Reason
Such signs are erected for purely commercial brand awareness reasons and do not relate to the site to which they are attached. These signs can greatly detract from amenity values.

(iv) Signs on Vehicles

No sign shall be placed or affixed to a vehicle and/or trailer which is parked on private or public property (including a road) where the apparent purpose is to advertise a product, service or activity or direct people to a business or activity on a nearby property.

Note: This does not restrict signs placed on or affixed to vehicles such as lettering where the sign is incidental to the primary use of the vehicle.

Any sign that breaches this rule is a non-complying activity.

(v) Standards and Conditions **12.7.5(v)**

(a) Message Clarity

The message on all signs must be clear, concise and of a clear lettering style. Clarity of the sign message is directly related to the speed limit of the adjacent road.

Table 12.2 is derived from Transit NZ guidelines with respect to acceptable lettering sizes in relation to speed limits.

Table 12.2 Minimum Lettering Sizes
Lettering Height (mm)

Regulatory Speed Limit Km/h	Lettering Size
<70	120mm
>70	160mm

(b) Similarity to Traffic Signs

Signs shall not be designed so as to imitate the colour and shape of recognised traffic signs.

Reason

Signs coloured and shaped similar to standard traffic control warning signs can create confusion and therefore danger on the road.

(c) Signs Affecting Traffic Safety

Signs shall not be located where they are likely to distract drivers in a situation where road conditions demand full and uninterrupted driver concentration and in particular:

1. They shall not be located where they may obstruct driver visibility, along the road, intersections or accesses.
2. They shall be located approximately at a right angle to the road.
3. They shall be as close as practicable to the access point of the land to which the sign relates.

Reason

Signs can have a significant impact on traffic safety.

12.7.6 LIGHTSPILL

Cross Reference
Policy 12.4.7

(i) Lightspill Standard

No activities shall result in greater than 10 lux spill (horizontal and vertical) of light onto any adjoining property or road, measured at the boundary of a road or the notional boundary of a neighbouring property, provided that this rule shall not apply to headlights of moving vehicles or vehicles that are stationary for less than 5 minutes or to street lighting.

The amount of light that may be spilled onto a neighbouring property may be increased by not more than 100%, provided that the neighbouring property is:~~in cases where the activity on that neighbouring property is not residential~~

1. Not residential, or
2. Adjacent to the Cromwell Chafer Beetle Nature Reserve.

Note: The "notional boundary" in respect of a residential activity means the line 20 metres from the façade of the building or the legal boundary of the site on which the building is located where the boundary is closer to the building than 20 metres.

(ii) Breach of Standard

Any activity which does not comply with this rule shall be a discretionary (restricted) activity.

Council shall restrict the exercise of its discretion to the effects on amenity values of the neighbourhood and the safe and efficient operation of adjoining roads.

Reason

Lightspill from external lighting can be a nuisance and can be avoided by careful siting and design of lighting fixtures.

12.7.7 BUILDING LINE RESTRICTIONS

Cross Reference
Policy 12.4.1 Resource Area Policies; Rule 13.7.15(i) – (Oxidation ponds or sewerage treatment facilities)

(i) No building shall be erected within any building line restriction shown on the planning maps between the building line and the feature to which it relates.

(ii) Breach of Standard

Any activity which does not comply with this rule shall be a discretionary restricted activity.

Council shall restrict the exercise of its discretion to the following matters:

1. The effect on the natural character of water bodies and their margins.
2. The effect on amenity values of the neighbourhood in particular the character of the streetscape.
3. The effect on the safe and efficient operation of the roading network.
4. The effect on infrastructure.
5. The effect on the safety of neighbours.
6. The effects of noise from the operation of the roading network and compliance with AS/NZS 2107:2000.

Reason

Building line restrictions are a useful technique to protect amenity values and the safe and efficient operation of certain roads. They are also useful to avoid the effects of natural hazards on the built environment. The area subject to restriction is shown as 'BLR' on the planning maps.

12.7.8 TRANSMISSION LINES

Cross Reference
Policy 12.4.10

(i) No building shall be erected within 12 metres from the centreline and 12 metres from the outer edge of the support structure of a high voltage transmission line that is part of the transmission network and is designed to operate at or over 110kV provided that this rule does not apply to:

1. Buildings and structures less than 2.5m high and 10m2 in area which are at least 12 metres from the outer edge of the support structure of a high voltage transmission line and comply with NZECP 34:2001.
2. Network utilities and power generation facilities that connect to the transmission network.
3. Fences which comply with NZECP 34:2001.
4. Stock yards, silage storage and irrigation structures which are at least 12 metres from the outer edge of the support structure of a high voltage transmission line and comply with NZECP 34:2001.
5. Buildings and structures and alterations to buildings and structures that are located in the Rural Resource Area and which are associated with primary production (excluding milking shed buildings, intensive farming buildings other than wintering barns and/or buildings for the rearing of calves, and buildings that accommodate a Retail Activity – Rural Selling Place, Retail Activity – Winery (Off Licence), Retail Activity - Winery or Retail Activity) and which are at least 12 metres from the outer edge of the support structure of a high voltage transmission line and comply with NZECP 34:2001 for minimum distance beneath conductors.

Wintering barns shall have all of the following characteristics in order to be exempt from this rule:

- No more than 3 workers shall be engaged in the activity;
- Used only during the period 15 April – 15 August;
- The capacity for the cows to leave the building in the event that work on the transmission network is required; and
- Used only to house dry milking stock.

Buildings for the rearing of calves shall have the following characteristic in order to be exempt from this rule:

- The capacity for the calves to leave the building in the event that work on the transmission network is required.

6. Crop support structures and artificial crop protection structures (including any connected support cables or wires) that:

a) comply with NZECP 34:2001 for minimum distance beneath conductors; and
b) are at least 12 metres from the outer edge of the support structure of a high voltage transmission line that is a tower (pylon) except where the written consent of the high voltage transmission line owner has been given in accordance with clause 2.4.1 of NZECP 34:2001; or
c) are at least 8 metres from the outer edge of the support

structure of a high voltage transmission line that is a pole and:

(i) are no more than 2.5 metres high; and

(ii) are removable or temporary, to allow a clear working space 12 metres from the pole when necessary for maintenance purposes; and

(iii) allow all weather access to the pole and a sufficient area for maintenance equipment, including a crane;

except where the written consent of the high voltage transmission line owner has been given in accordance with clause 2.4.1 of NZECP 34:2001.

7. Alterations and extensions to existing buildings where the alteration or extension does not occur closer to the centreline and outer edge of the support structure of a high voltage transmission line either horizontally or vertically from the existing building.

Any activity that does not comply with this rule is a non-complying activity.

Note: Large buildings in the vicinity of a transmission line must be appropriately earthed in order to manage electrical risks.

(ii) Notwithstanding Rule 12.7.8(i) no building or alteration and extension to an existing building located to the south of the existing Akarua Winery complex on Lot 14 DP 25773 shall be erected within 12 metres from the centreline and 12 metres from the outer edge of the support structure of a high voltage line that is part of the transmission network and is designed to operate at or over 110kV.

Any activity that does not comply with this rule is a discretionary activity.

Any application for resource consent under Rule 12.7.8(ii) may be considered on a non-notified basis, subject to the provisions of sections 95A and 95B of the Resource Management Act 1991 where the written approval of Transpower New Zealand Limited is provided.

(iii) No residential building, educational facility, resthome or hospital shall be erected or located within 12 metres from the centreline and 12 metres from the outer edge of the support structure of a high voltage transmission line that is part of the transmission network and is designed to operate at or over 110kV provided that this rule does not apply to:

1. Buildings and structures less than 2.5m high and 10m2 in area which are at least 12 metres from the outer edge of the support structure of a high voltage transmission line and comply with NZECP 34:2001.
2. Fences which comply with NZECP 34:2001.

Any activity that does not comply with this rule is a non-complying activity.

(iv) Any earthworks within 12 metres from the centreline and 12 metres from the outer edge of the support structure of a high voltage transmission line that is part of the transmission network and is designed to operate at or over 110kV shall comply with the following standards:

a) Earthworks within 2.2m of a pole support structure or stay wire shall not be greater than 300mm in depth.
b) Earthworks between 2.2m and 5m of a pole support structure or stay wire shall not be greater than 750mm in depth.
c) Earthworks within 6m of the outer edge of the visible foundation of a tower support structure shall not be greater than 300mm in depth.
d) Earthworks between 6m and 12m of the outer edge of the visible foundation of a tower support structure shall not be greater than 3m in depth.
e) Earthworks shall not create an unstable batter that will affect a transmission support structure.
f) Earthworks shall not result in a reduction of the existing conductor clearance distance above the ground as required in NZECP 34:2001.

Provided that:

- The earthworks standards in Rule 12.7.8(iv)(a) and (b) do not apply to vertical holes, not exceeding 500mm in diameter, beyond 1.5m from a pole support structure or stay wire.
- The earthworks standards in Rule 12.7.8(iv) do not apply to earthworks that satisfy e) and f) above and that are undertaken as part of cultivation or routine disturbance of soil being part of grazing, cropping, orcharding and viticulture operations; maintenance of drains and in-ground irrigation infrastructure including irrigation races; other network utilities and power generation facilities; and the repair, sealing, or resealing of an existing road, farm track, driveway or footpath.

Any activity that does not comply with this rule is a discretionary (restricted) activity. Council shall restrict the exercise of its discretion to the following matters:

1. Any effects in terms of the structural integrity of the transmission line;
2. Height, area and location of earthworks, including temporary activities such as stockpiles;
3. Site reinstatement;
4. The use of mobile machinery near the transmission line which may put the line at risk;
5. Compliance with NZECP 34:2001;
6. The risk of electrical hazards affecting public or individual safety; and
7. The outcome of any consultation with the transmission line owner.

Any application for resource consent for a discretionary (restricted) activity under Rule 12.7.8(iv) is likely, subject to the provisions of sections 95A and 95B of the Resource Management Act 1991, to

generally be considered without notification and Transpower New Zealand Limited is likely to be the only party considered affected.

(v) No subdivision shall occur within 32 metres from the centreline and 32 metres from the outer edge of the support structure of a high voltage transmission line that is part of the transmission network and is designed to operate at or over 110kV.

Any activity that does not comply with this rule is a discretionary (restricted) activity. Council shall restrict the exercise of its discretion to the following matters:

1. The extent to which the subdivision design avoids, remedies or mitigates conflicts with the transmission line, for example through the location and design of roads, reserves and landscaping;
2. Capability of the allotment to accommodate a building platform which complies with Rules 12.7.8(i), (ii) and (iii) and earthworks that comply with Rule 12.7.8(iv).
3. The ability to maintain and inspect the transmission line, including ensuring access;
4. The extent to which the design and development of the subdivision will minimise the risk of injury and/or property damage from the transmission line;
5. Compliance with NZECP 34:2001, and
6. The outcome of any consultation with the transmission line owner.

Any application for resource consent for a discretionary (restricted) activity under Rule 12.7.8(v) is likely, subject to the provisions of sections 95A and 95B of the Resource Management Act 1991, to generally be considered without notification and Transpower New Zealand Limited is likely to be the only party considered affected.

Note: The status of a subdivision is also determined by the rules that apply to subdivision in the context of the Resource Area concerned.

Reason

The separation distances provided for in Rule 12.7.8 are to avoid reverse sensitivity, to avoid compromising the operation, maintenance, upgrading and development of the transmission network and to avoid risk to people. Interested persons are also advised that:

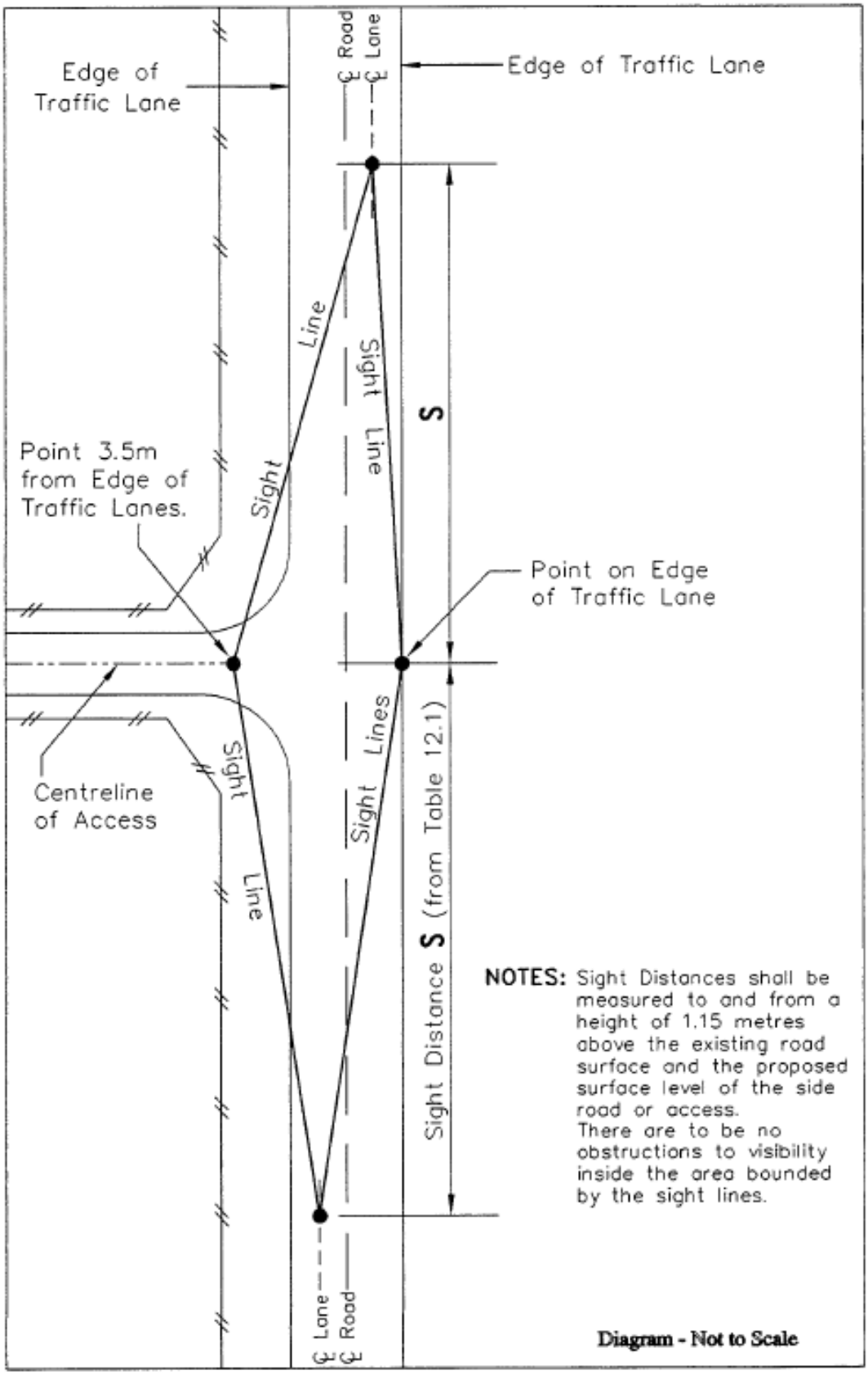
- *High Voltage Transmission Lines that are part of the transmission network are identified on the planning maps.*
- *Works in close proximity to any electricity line can be dangerous. Compliance with the New Zealand Electrical Code of Practice 34:2001 (NZECP 34:2001) is mandatory for all buildings, earthworks and mobile plant within close proximity to all electric lines.*
- *Vegetation to be planted within the high voltage transmission corridors should be selected and/or managed to ensure that it will not result in that vegetation breaching the Electricity (Hazards from Trees) Regulations 2003. To discuss works, including tree planting, near any electrical line, interested persons are advised to contact the line operator.*

TABLE 12.3 - VEHICLE PARKING REQUIREMENTS

(Rule 12.7.2 page 12:16)

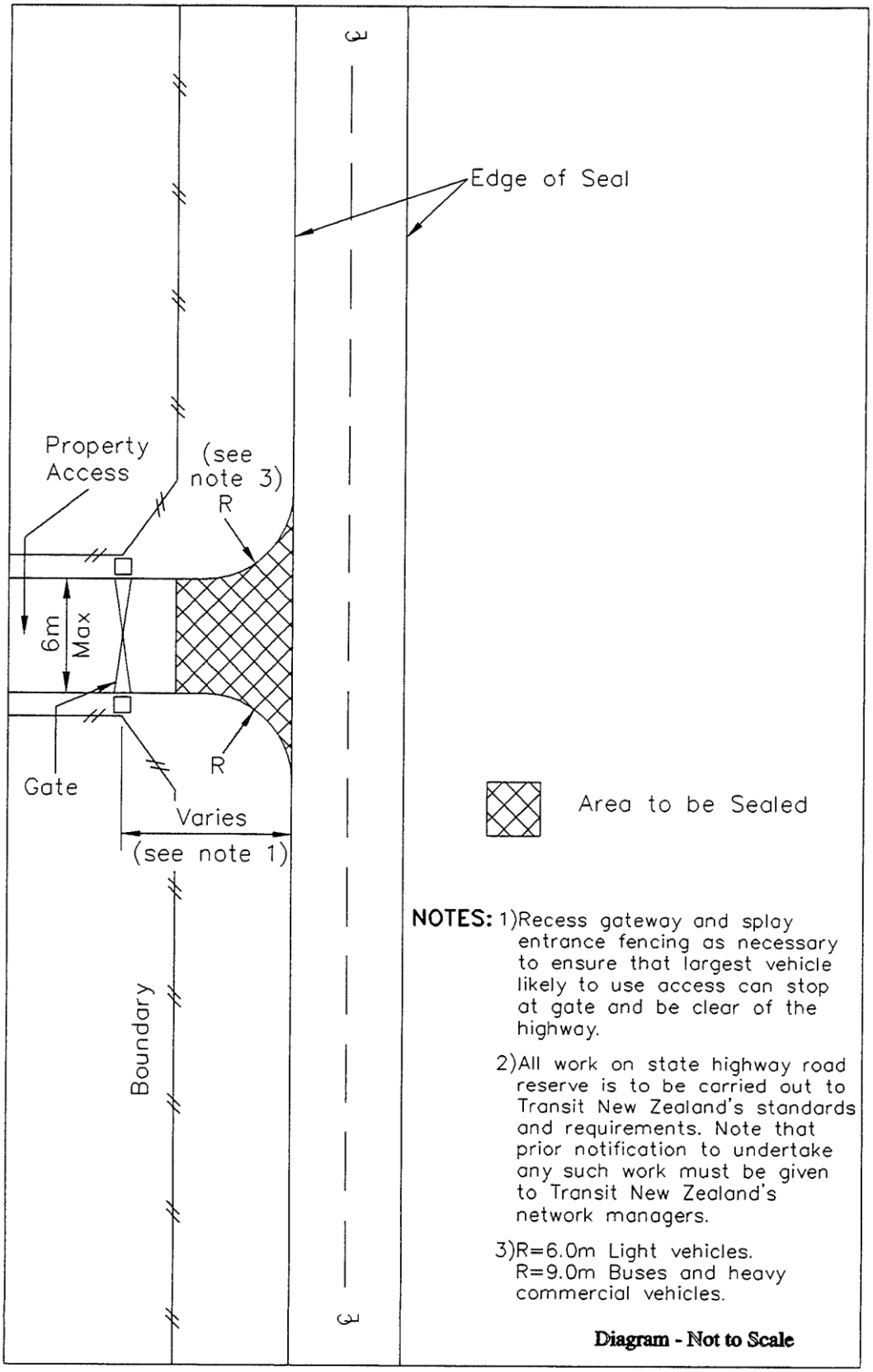
ACTIVITY OR USE OF LAND OR BUILDING	SPACES REQUIRED
RESIDENTIAL	
Dwelling	1 per unit
Home Occupation	1 space in addition to the requirement for a household unit
COMMERCIAL - INDUSTRIAL	
Travellers Accommodation & Homestay	1 per bedroom or 1 per 4 occupants whichever is the greater
Shops	1 per 30m² gross floor area
Supermarket	1 per 20m^2 gross floor area
Service Stations	1 per 40m² gross floor area excluding canopies over petrol pumps
Restaurant and Taverns	1 per 10m² of net public floor space or 1 space per 4 seats whichever is the greater
Outdoor Display Area	1 per 100m² gross display area
Vehicle Showrooms	1 per 100m² gross floor area
Offices	1 per 100m² gross floor area
Industrial Premises and Warehouses	1 per 100m² gross floor area or 1 per 2 staff members whichever is the greater
Industrial storage, internal or external except warehouses	1 per 100m² gross floor area
EDUCATIONAL	
Childcare facility, Primary and primary age roll for Area Schools	1 for every staff member
Secondary School and secondary age roll for Area Schools	1 for every staff member plus 1 for every 10 students over the age of 15 years
HEALTH	
Health care facilities	2 spaces per professional plus 1 per 2 other staff members
COMMUNITY/RECREATION	
Places of Public or Private Assembly	1 per 10m² of net public floor area or 1 per 10 seats
Sports Fields	15 spaces per hectare
Emergency Service Activities	1 per 100m² gross floor area
RURAL	
Residential	1 per dwelling

Figure 12.1 – Sight Distance Measurement



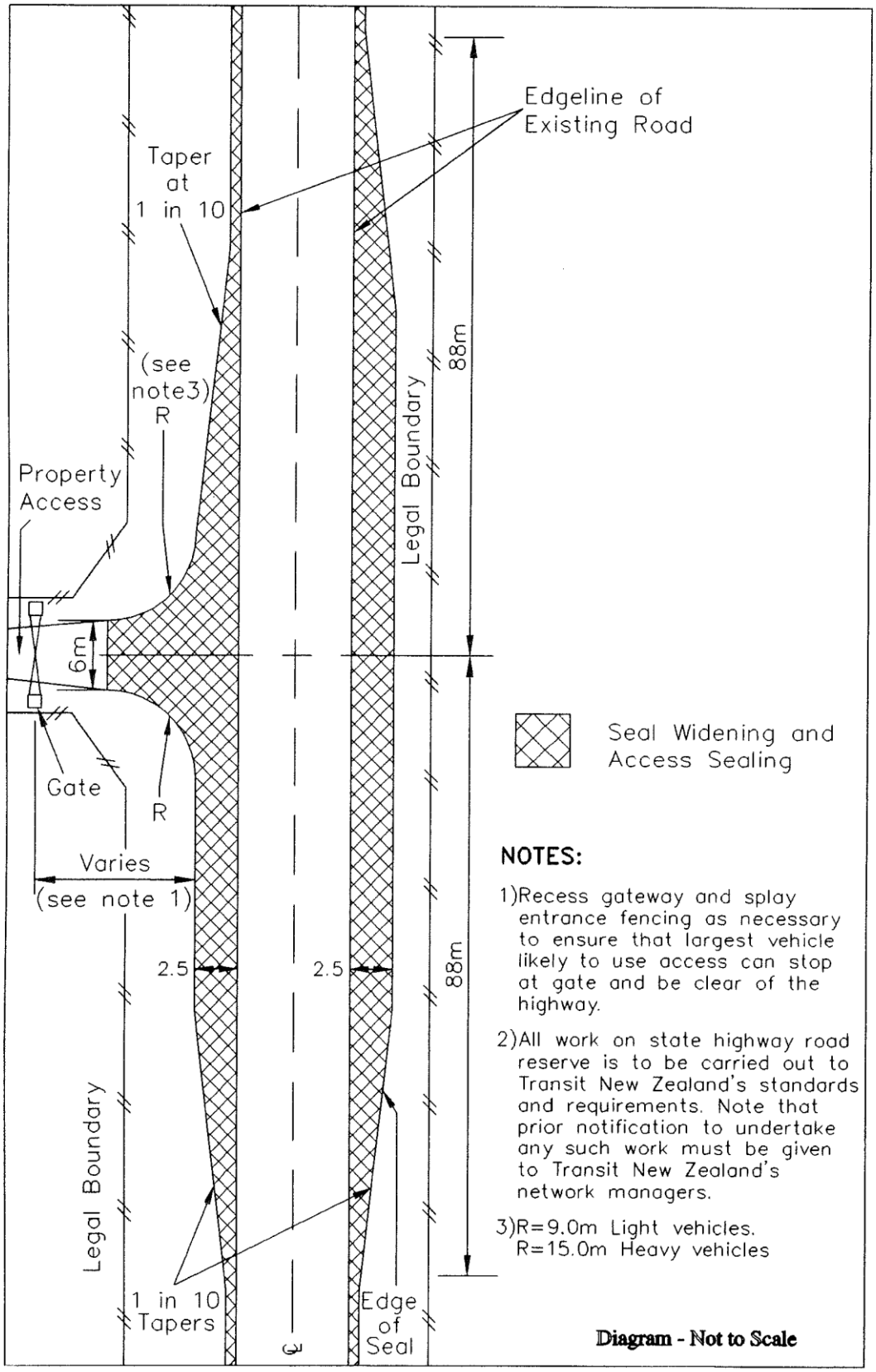
Source : Addendum to Part III– "Planning For a Safe and Efficient State Highway Network Under the Resource Management Act 1991" – Transit New Zealand, 13 November 1996.

Figure 12.2 – Access Standard, Low Traffic Generation



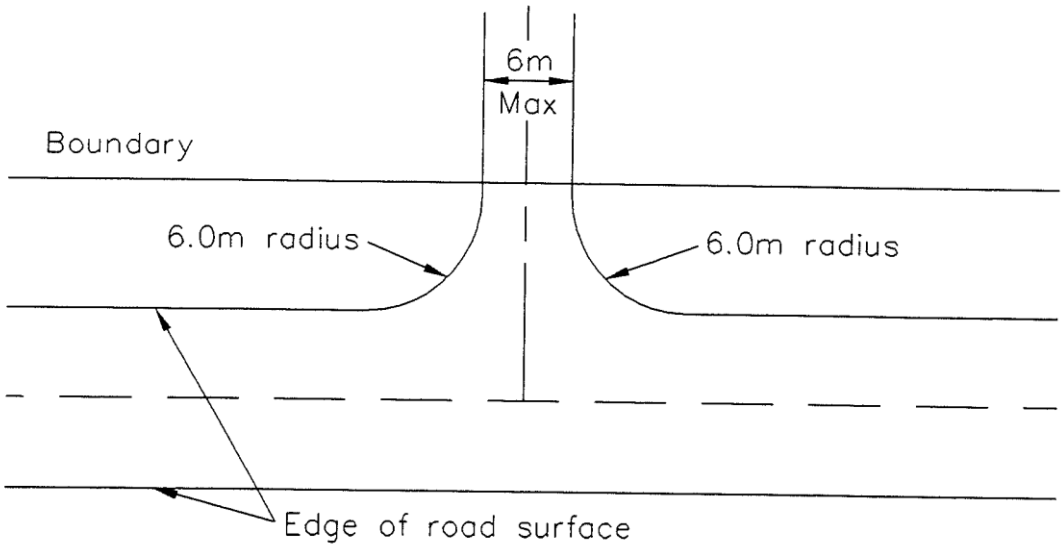
Source : Addendum to Part III– "Planning For a Safe and Efficient State Highway Network Under the Resource Management Act 1991" – Transit New Zealand, 3 March 1997.

Figure 12.3 – Access Standard, High Traffic Generation



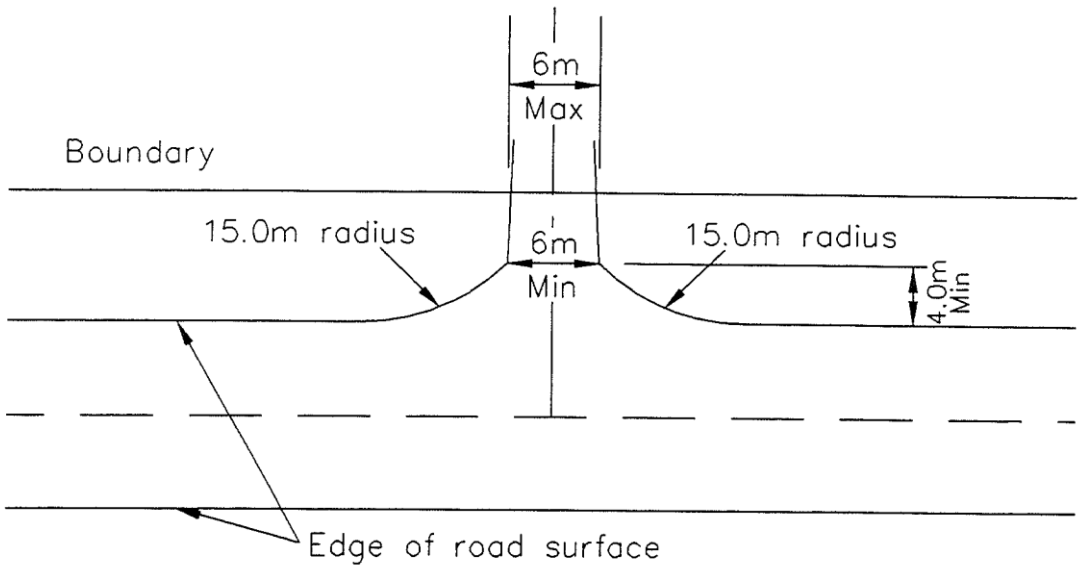
Source : Addendum to Part III- "Planning For a Safe and Efficient State Highway Network Under the Resource Management Act 1991" – Transit New Zealand, 13 November 1996.

Figure 12.4 - Residential Access to Rural Collector Roads (see Schedule 19.7)



Access layout for Residential activities including
DWELLINGS, RURAL RESIDENTIAL BLOCKS.

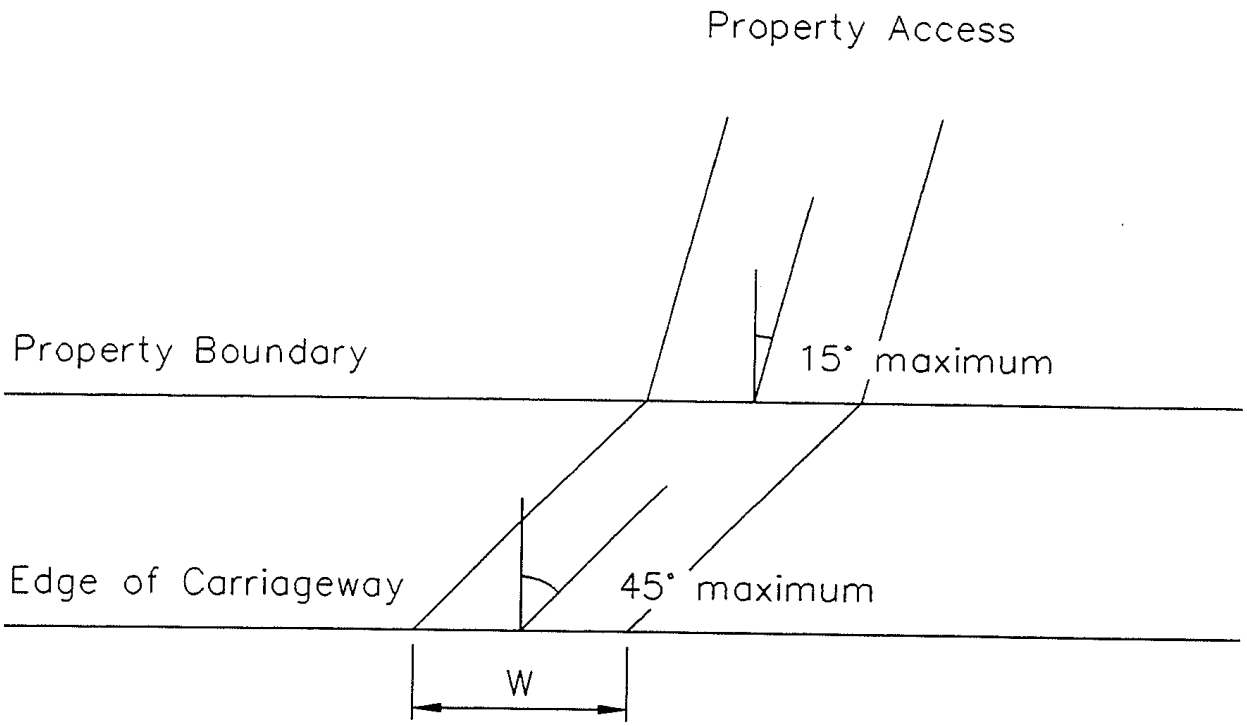
Figure 12.5 - Non-Residential Access to Rural Collector Roads (see Schedule 19.7)



Access layout for Non–Residential activities including
FARMING and OTHER USES.

Diagram - Not to Scale

Figure 12.6 - Access to Urban State Highways & Urban Arterial Roads (see Schedule 19.7)



W : Low usage 3.5m maximum
High usage one way operation 3.5, 6.0m
two way operation 6.0, 9.0m

Diagram - Not to Scale

Figure 12.7 - Typical Parking Layout

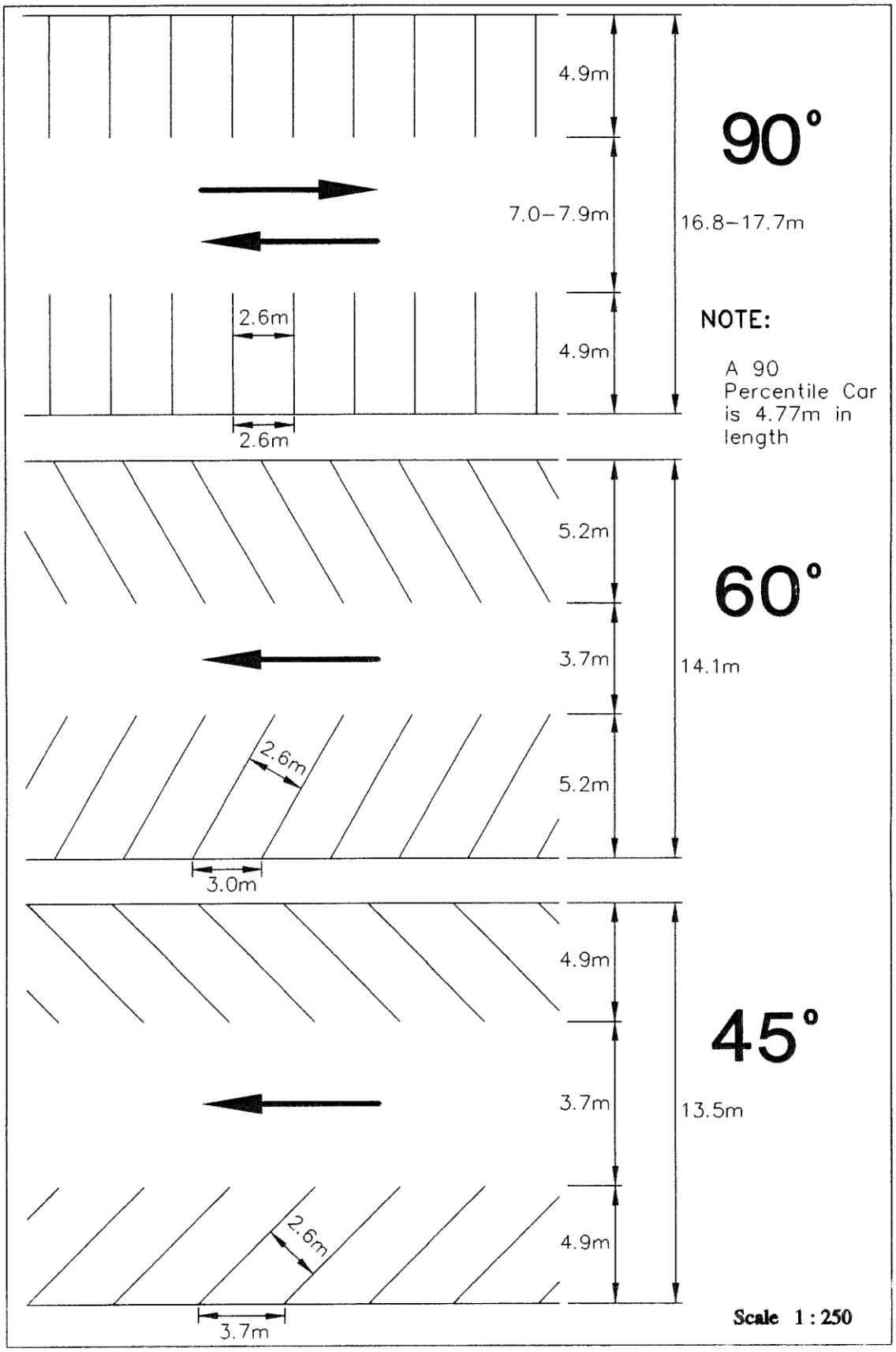
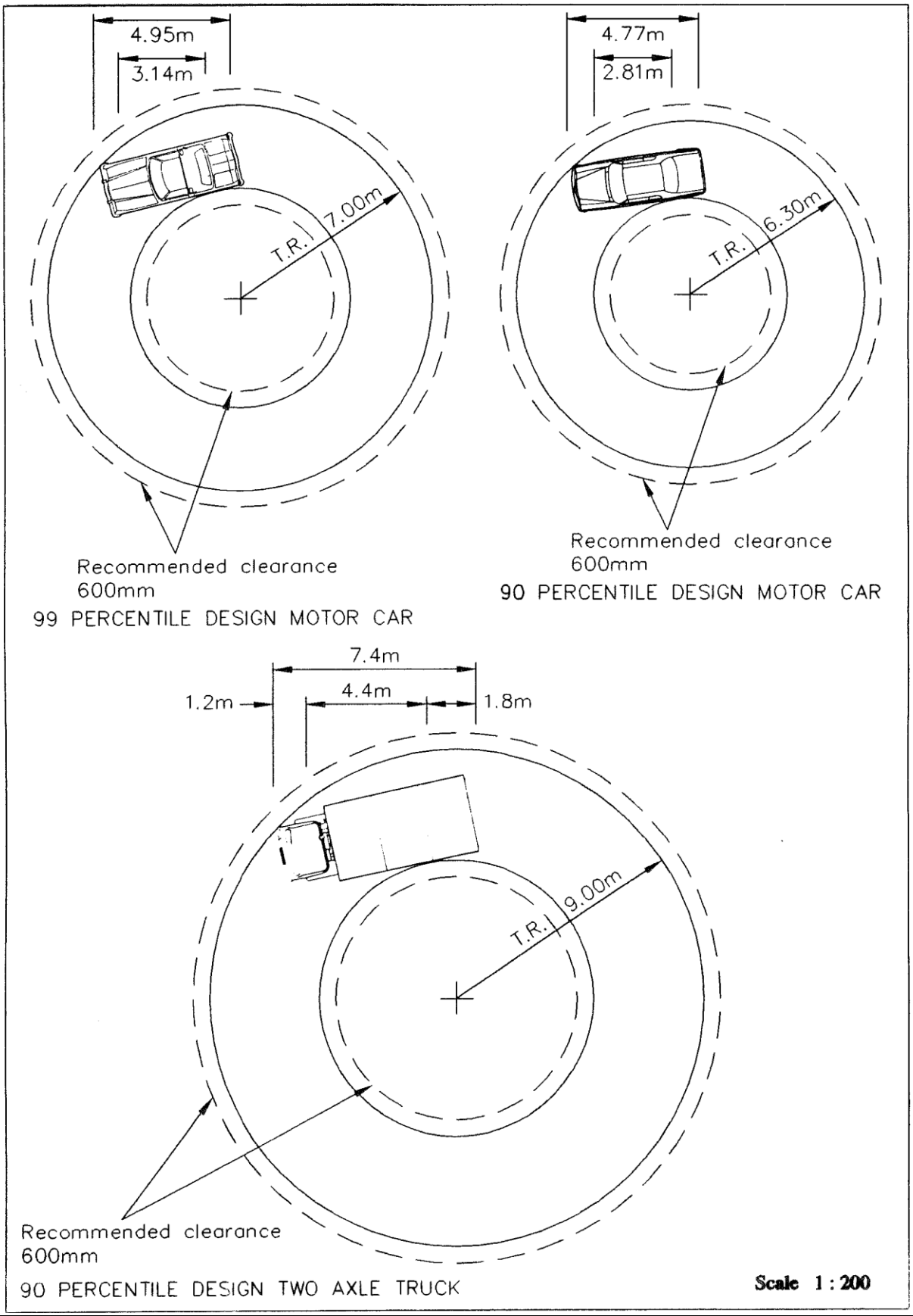


Figure 12.8 - Standard Design Vehicles



12.8 ENVIRONMENTAL RESULTS ANTICIPATED

12.8.1 Safe and efficient operation of the roading network through improved safety and reduction in conflict with adjoining land users.

12.8.2 Living and working environments that are not adversely affected by noise.

12.8.3 A lack of visually intrusive signs, derelict building, sites and incomplete works.

12.8.4 Containment of adverse effects associated with odour, dust, glare and electrical interference within the site.