

BEFORE THE INDEPENDENT HEARINGS PANEL

UNDER

the Resource Management Act 1991

AND

IN THE MATTER OF

the submissions of B & A Stokes on
the Waimakariri Proposed District
Plan (#214) and Variation 1 (#29)

**PRIMARY EVIDENCE OF
CHRIS ROSSITER
ON BEHALF OF B AND A STOKES**

(Traffic)

4 March 2024

GREENWOOD ROCHE

LAWYERS

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1 EXECUTIVE SUMMARY

- 1.1 The Stokes' submissions on the proposed Waimakariri District Plan (**PDP**) seek a residential zoning of their land at 81 Gressons and 1375 Main North Road, Woodend, Waikuku (the **Site**) from a mixture of Rural Lifestyle Zone (**RLZ**), Large Lot Residential Zone (**LLRZ**) and Large Lot Residential Zone Overlay (**LLRZO**) (as notified) to General Residential / Medium Density Residential Zoning (the **Proposal**). Development of the Site in accordance with that zoning would occur in accordance with an Outline Development Plan (**ODP**) included as an Appendix to Mr Cleese's evidence. The Proposal would enable approximately 1,500 dwellings to be constructed in close proximity to the Ravenswood Key Activity Centre (**KAC**).
- 1.2 Objective 1 of the National Policy Statement on Urban Development 2020 (**NPS-UD**) is for New Zealand to have "*well-functioning urban environments that enable all people and communities to provide for their social, economic, and cultural wellbeing...*". "Well-functioning" urban environments are urban environments which, *inter alia*, have or enable a variety of homes; and have good accessibility for all people between jobs, community services and open spaces, including by way of public or active transport. "Well-functioning urban environments" also support a reduction in greenhouse gas emissions.¹
- 1.3 The proposed ODP comprises road, pedestrian and cycle networks which will provide a high level of connectivity both within the new residential area but also to the surrounding transport networks. New intersections are proposed on Gressons Road and the internal roads will enable connections to existing roads in Ravenswood, Kesteven Place and Lorrimer Street. No new connections are proposed to State Highway 1 (**SH1**).
- 1.4 Although there are no public transport services on Bob Robertson Drive through Ravenswood currently, the road network has been designed to accommodate buses and the implementation of new services is flagged in the explanatory text for Waimakariri District Operative District Plan (**WODP**) Map 158 which shows the extension to the Ravenswood KAC.

¹ National Policy Statement on Urban Development 2020, policy 1.

The grid style road network proposed by the ODP would also allow any new service route to be extended into the Site to provide convenient access for residents.

- 1.5 The establishment of a new residential development close to the Ravenswood KAC by way of the Proposal means that a high proportion of trips for employment or retail can be made by modes other than a private vehicle. The Site also has access to the Christchurch public transport service. Together, I would expect these factors to contribute to a reduction in greenhouse gas emissions compared with residential development of rural land without access to bus services or convenient access to retail and employment.
- 1.6 My investigation of potential transport effects using the Christchurch Transport Model (**CTM**) does not raise any concerns with the operation of the road network. Even without any new bus services being established, the modelling results suggest that development of the Site with 1,500 households can be accommodated on the road network with intersection Levels of Service generally being C or better. The only exception is the SH1 / Bob Robertson Drive / Pegasus Boulevard intersection which may operate at LOS D during the evening peak by 2048. On that basis, I have concluded that the full development of the Site would not contribute to transport effects that could not be accommodated by the planned changes to the network.
- 1.7 Overall, I have concluded that enabling residential development on the Site will contribute to a well-functioning urban environment from a transport perspective because of its proximity to the Ravenswood KAC and also ease of access to the wider strategic road network.

2 QUALIFICATIONS AND EXPERTISE

- 2.1 My full name is Michael Christopher Rossiter. I hold the position of Principal Transportation Engineer at Stantec New Zealand Limited (**Stantec**). I have been in this position since 2013 and have been employed at Stantec (and TDG prior to its incorporation with Stantec) since 2006. Prior to joining TDG (now part of Stantec) I was employed as a Principal Systems Engineer and Technical Manager with BAE Systems in England.

- 2.2 I hold the academic qualifications of Bachelor of Science from the University of Exeter and Bachelor of Arts (Open) from the Open University.
- 2.3 I am registered as a Chartered Engineer with Engineering New Zealand. I have over 35 years' engineering experience including 17 years' transportation engineering in New Zealand on a wide range of projects involving transportation engineering design, transportation planning and assessment, analytical investigations and road safety audits.
- 2.4 My role involves both preparing transportation assessment reports for resource consent applications and also providing transportation engineering peer review services for councils. I have also prepared expert transport evidence on behalf of several councils and private developers in relation to a variety of land-use resource consent hearings including:
- (a) Allendale Lane, Lincoln – Prepare submissions on the Selwyn District Council Proposed District Plan and Variation 1 to the Proposed District Plan for residential zoning of General Rural Zoned (**GRUZ**) land.
 - (b) Tancreds Road, Lincoln – Prepare submissions on Selwyn District Council Proposed District Plan and Variation 1 to the Proposed District Plan for industrial zoning of GRUZ land.
 - (c) Whisky Creek, Palmerston North - Prepare expert evidence on behalf of Palmerston North City Council in response to a Private Plan Change application for residential zoning.
 - (d) Various sites in Queenstown Lakes District – Prepare expert evidence on behalf of Queenstown Lakes District Council in response to submissions for alterations to notified Proposed District Plan land zonings.
- 2.5 I have been engaged to provide evidence in relation to the Submitter's submissions on the PDP and Variation 1 to the PDP. I am familiar with the content of the submissions.

3 CODE OF CONDUCT

3.1 While this is not an Environment Court proceeding, I confirm that I have read the Code of Conduct for Expert Witnesses set out in the Environment Court Practice Note 2023. I have complied with the Code of Conduct in preparing this evidence and will continue to comply with it while giving oral evidence. Except where I state that I am relying on the evidence of another person, this written evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.

4 SCOPE OF EVIDENCE

4.1 My evidence has been structured to provide the following information:

- (a) a description of the existing transport environment;
- (b) a description of existing travel patterns;
- (c) a description of planned changes to the transport environment;
- (d) a description of the transport aspects of the ODP;
- (e) an assessment of expected traffic generation and movement patterns;
- (f) an assessment of potential effects on the transport network; and
- (g) an assessment against the transport related objectives set out in the PDP and the NPS-UD.

4.2 In preparing this evidence, I have reviewed:

- (a) B & A Stokes' submission 211 to the PDP;
- (b) B & A Stokes' submission 214 to the PDP; and
- (c) B & A Stokes' submission 29 on Variation 1 to the PDP.

5 EXISTING TRANSPORT ENVIRONMENT

Road network

- 5.1 **Figure 5-1** shows the location of the Site between Waikuku and Ravenswood within the wider context of the Waimakariri district. Rangiora is located about seven km to the west by road with Kaiapoi about nine km to the south. Christchurch is about 26 km to the south.



Figure 5-1: Site Location

- 5.2 **Figure 5-2** shows the Site is located on the western side of SH1. The Site is bounded by Gressons Road and Waikuku village to the north, Wards Road to the south and rural land to the west. Ravenswood is south of Wards Road. Pegasus township is located to the east, and Woodend is to the south of Ravenswood.

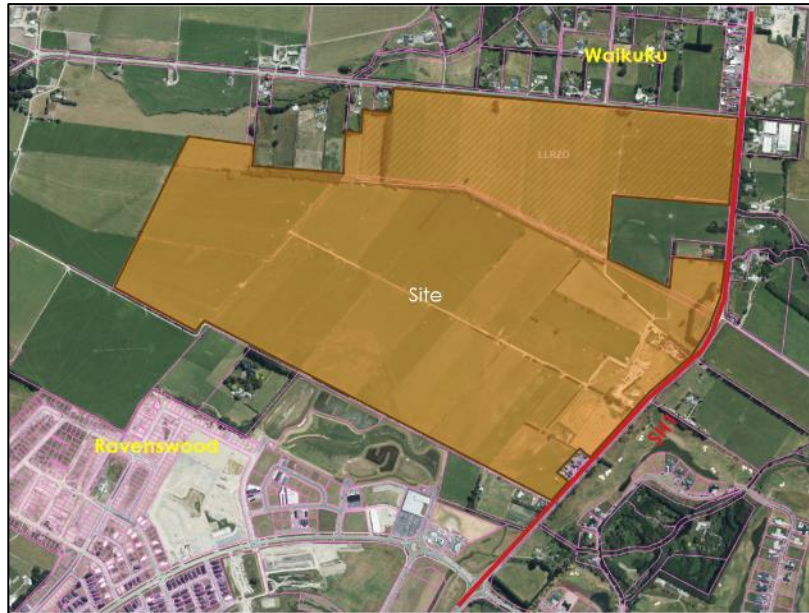


Figure 5-2: Site Location between Waikuku and Ravenswood

5.3 **Figure 5-3** shows the Waimakariri District Council (**WDC**) road hierarchy within the PDP. SH1 is classified as a strategic road and forms the main north-south link connecting towns along the east coast of the South Island. State Highway 71 (**SH71**) which links Kaiapoi and Rangiora is also classified as a Strategic Road.

5.4 Rangiora Woodend Road links Woodend with Rangiora and is classified as an Arterial Road. Gressons Road to the north and Bob Robertson Drive to the south of the Site are both classified as Collector roads.



Figure 5-3: Road Hierarchy

- 5.5 SH1 has been constructed in NZTA designated land as a two-lane, rural highway north of the Ravenswood roundabout (**Photograph 5-1** and **Photograph 5-2**). Between the Ravenswood roundabout and Waikuku the sealed carriageway comprises two 3.5 metre wide traffic lanes and 1-1.5 metre wide shoulders. The speed limit on SH1 is 80 km/h between Woodend and Waikuku and is 60 km/h within Waikuku.



Photograph 5-1: SH1 / Wards Road intersection



Photograph 5-2 SH1 north of Wards Road

5.6 Gressons Road, which forms the southern boundary to the Waikuku residential area, meets SH1 at a stop sign controlled intersection (**Photograph 5-3**). SH1 has been widened at the intersection to include a right turn bay as shown in **Photograph 5-4**. Gressons Road has a 6.9 m wide sealed carriageway with a marked centre line and edge lines as shown in **Photograph 5-5**. The speed limit on Gressons Road is 80 km/h.



Photograph 5-3: Gressons Road approach to SH1



Photograph 5-4: SH1 / Gressons Road intersection (Google Streetview)



Photograph 5-5: Gressons Road west of SH1

- 5.7 Wards Road forms the southern boundary to the Site and has been formed as a single lane, unsealed road with no passing bays (**Photograph 5-6**). It meets SH1 at a priority controlled intersection with all turning movements being permitted (**Photograph 5-7**).



Photograph 5-6: Wards Road west of SH1



Photograph 5-7: Wards Road approach to SH1

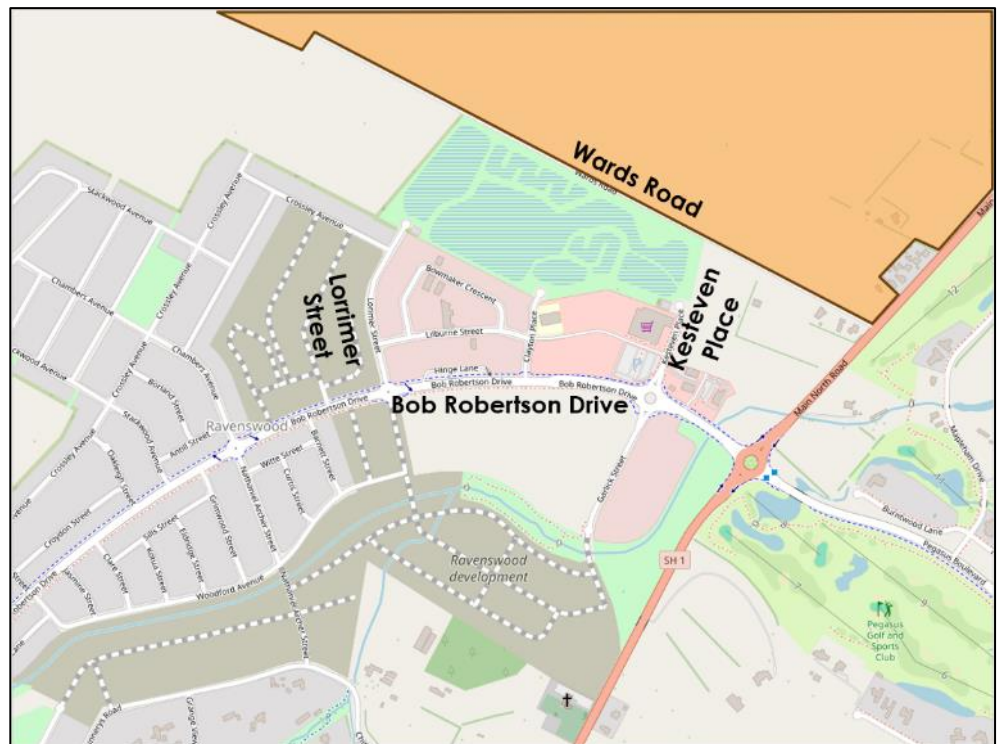


Figure 5-4: Ravenswood Road Network

- 5.8 **Figure 5-4** shows the Ravenswood road network. Bob Robertson Drive forms the primary road through the Ravenswood development and connects SH1 with Rangiora Woodend Road. It has been constructed as a median divided road and meets SH1 at a two-lane roundabout

intersection with Pegasus Boulevard to the east as shown in **Figure 5-5**. It meets Kesteven Place and Garlick Street at a single lane roundabout.



Figure 5-5: Aerial view of Bob Robertson Drive west of SH1 (Source: Canterbury Maps)

- 5.9 Kesteven Place has been formed with a 12 metre carriageway with no marked centre line. It meets Bob Robertson Drive at a roundabout with a 30 metre diameter central island and single circulating lane. Kesteven Place currently provides access to the supermarket car park and a fuel station only. The northern limit of that road terminates at a 25 metre diameter turning head (**Photograph 5-8**) which is located on rural zoned land. The land to the north forms part of the Open Space Zone and includes the storm water management system for Ravenswood. There are footpaths on both sides of Kesteven Place but these do not extend all the way to the turning head.
- 5.10 Lorrimer Street has an 11 metre wide carriageway (**Photograph 5-9**) and links Bob Robertson Drive with the residential development at the northern end of Ravenswood and also provides an access to the light industrial area to the east. Lorrimer Street meets Bob Robertson Drive at a roundabout intersection with Aitken Street which will forms one entry to the expanded KAC (**Photograph 5-11**). Lorrimer Street currently ends at a cul-de-sac turning head in the rural zoned land north of the Henshaw Street intersection (**Photograph 5-10**).



Photograph 5-8: Kesteven Place Turning Head



Photograph 5-9: Lorrimer Street north of Bob Robertson Drive



Photograph 5-10: Lorrimer Street turning head



Photograph 5-11: Bob Robertson Drive / Lorrimer Street roundabout

Public transport network

5.11 The existing public transport routes in the Waimakariri District are shown in **Figure 5-6**. There are two regional services that provide connections

to Christchurch - Route 91 (Rangiora to Cashmere) and Route 95 (Waikuku to City). Route 97 is a local service that connects Pegasus with Rangiora.

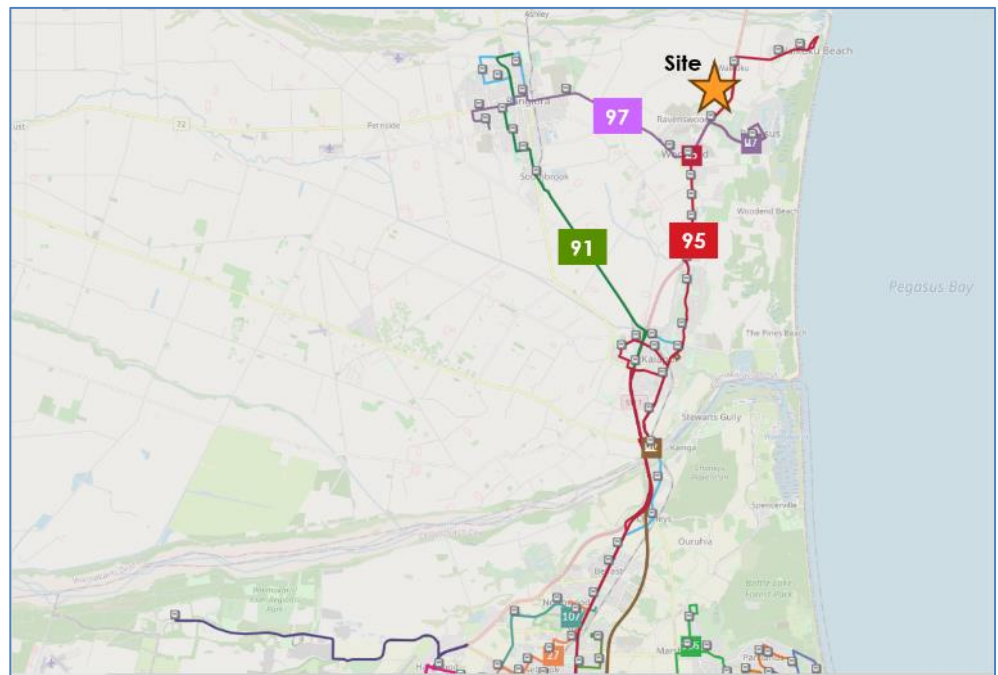


Figure 5-6: Public Transport Routes

5.12 Significant funding has been provided to enhance public transport route provision and frequency in greater Christchurch to increase patronage. Recent developments in the Waimakariri District include construction of three Park and Ride sites in Rangiora and two in Kaiapoi. I understand that another Park and Ride site will be established in Ravenswood. Travel time reliability for public transport services is being supported by implementation of a High Occupancy Vehicle lane across the Waimakariri River and into Christchurch.

5.13 I am not aware of any current plans for new public transport routes to service the Ravenswood area but Bob Robertson Drive has been designed to accommodate public transport services. The Greater Christchurch Transport Plan does indicate that new services will be established in the area and this is reflected in the WODP in relation to the development of Ravenswood.

Active mode network

5.14 **Figure 5-7** shows the WDC cycle network plan for the Woodend, Ravenswood and Pegasus area which shows Grade 1, family friendly links between the settlements (marked in red).

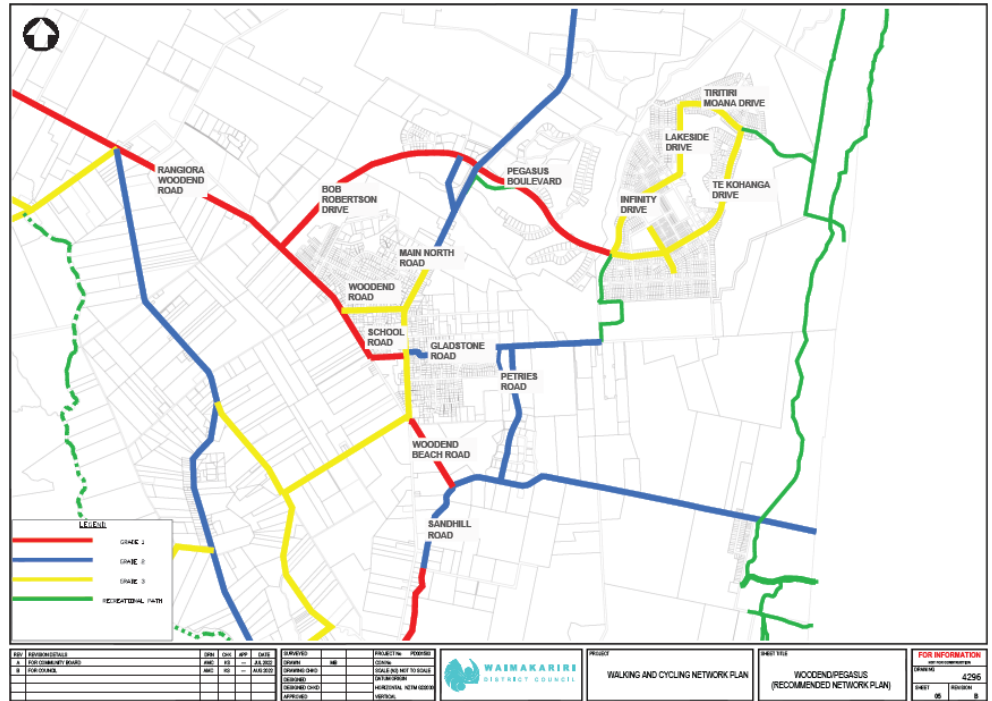
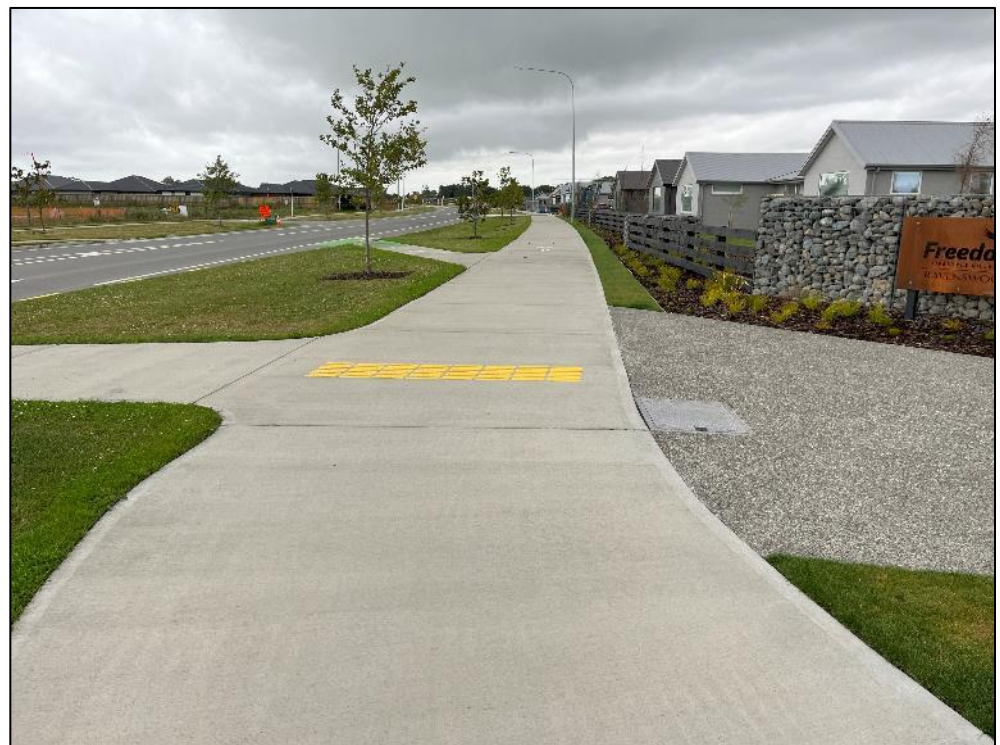


Figure 5-7: Woodend / Ravenswood / Pegasus Cycle Network Plan

5.15 Within Ravenswood, there is a shared path along the western side of Bob Robertson Drive as shown in **Photograph 5-12** and also cycle lanes on both sides of the road.



Photograph 5-12: Shared path on Bob Robertson Drive

6 EXISTING TRAVEL PATTERNS

SH1 traffic volumes

6.1 **Figure 6-1** shows the annual average traffic volumes recorded at the NZTA Waka Kotahi (**NZTA** or **Waka Kotahi**) count site on SH1 (01S00313) located south of the Gressons Road intersection. It indicates that average daily volumes have been about 13,000 vehicles per day (**vpd**) since 2020. The 90th percentile volume has been about 15,000 vpd in recent years.

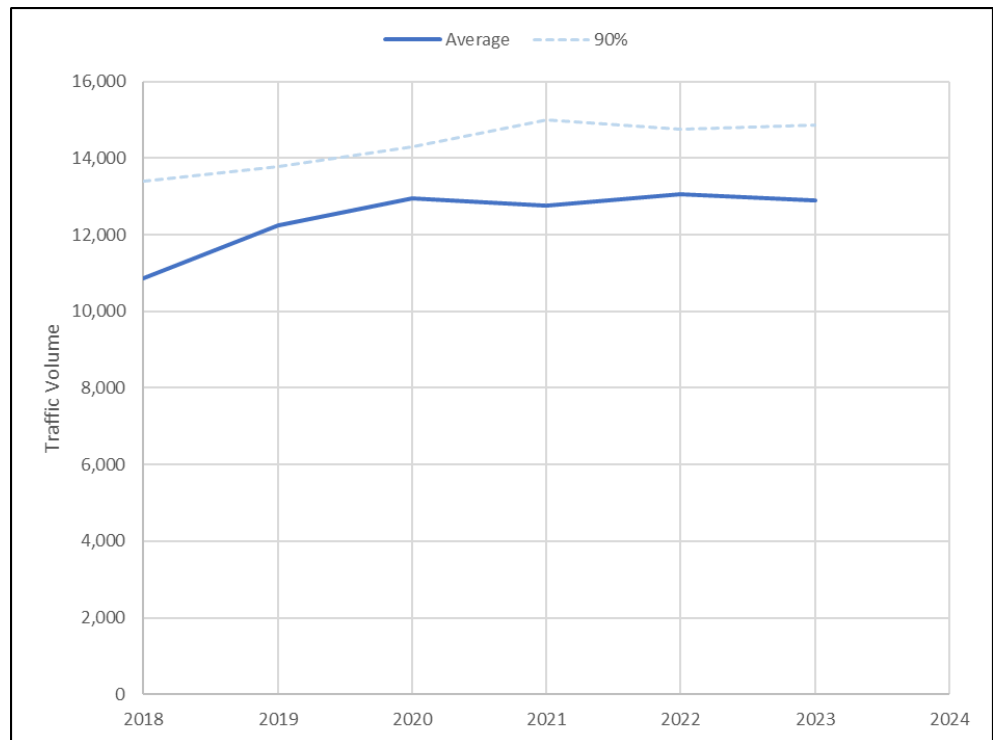


Figure 6-1: Annual Traffic Volumes on SH1 South of Gressons Road

6.2 **Figure 6-2** shows that there is wide variation in the daily traffic volumes on weekdays across the year. During the winter months, daily traffic volumes are typically below 14,000 vpd but can reach 16,000 vpd during the summer.

6.3 The weekday hourly variation in traffic volumes in March 2023 is illustrated in **Figure 6-3**. There was a southbound peak flow of about 500 vehicles per hour (**vph**) before 8:00am and a northbound peak flow of about 600 vph at 5:00pm. I attribute this flow pattern to workplace travel between towns to the north and the large employment centres to the south.

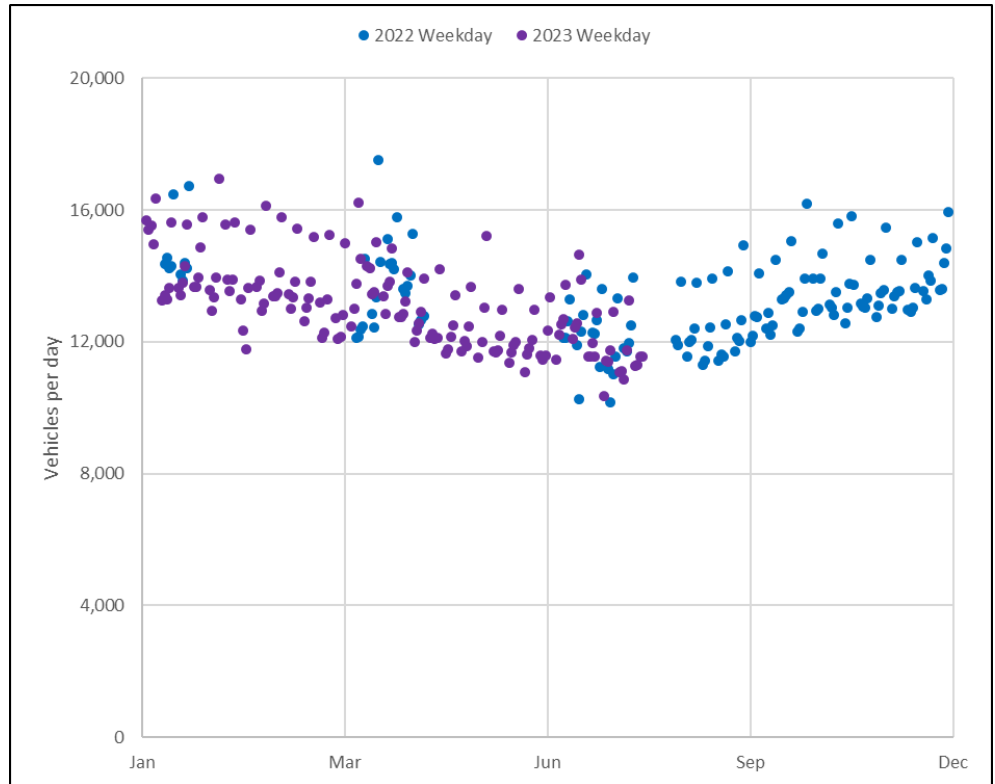


Figure 6-2: Variation in daily traffic volumes

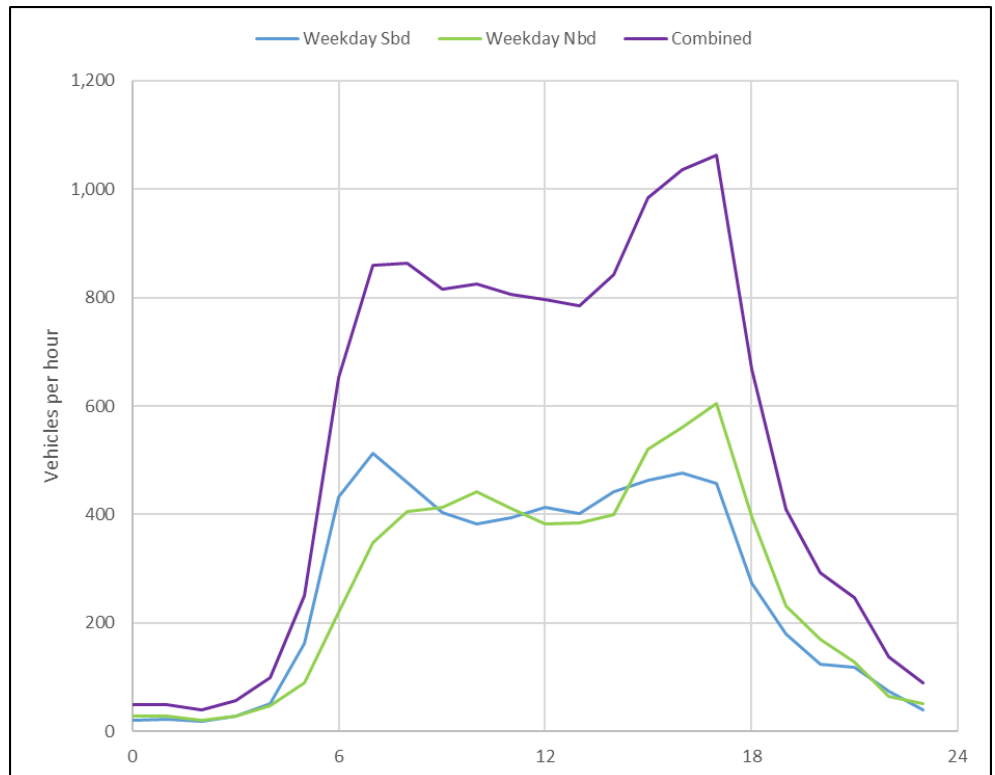


Figure 6-3: Weekday Hourly Variation in Traffic Volumes

Road safety

- 6.4 I have used the Waka Kotahi Crash Analysis System to review the road safety record of the roads surrounding the Site. The locations and numbers of crashes reported since the start of 2018 are shown in **Figure 6-4**. There have been two serious injury crashes reported, two minor injury crashes and 26 non-injury crashes over that period. Over 20 crashes have been reported at the Pegasus roundabout. These crashes are largely non-injury and involved either loss of control or collisions in queuing traffic.
- 6.5 One serious injury crash was reported on SH1 south of Preece Road in the early hours of the morning when a young driver lost control of their vehicle taking action to avoid an animal on the road. The other serious injury crash occurred on Gressons Road and was attributed to a potential medical event that caused the driver to lose consciousness.

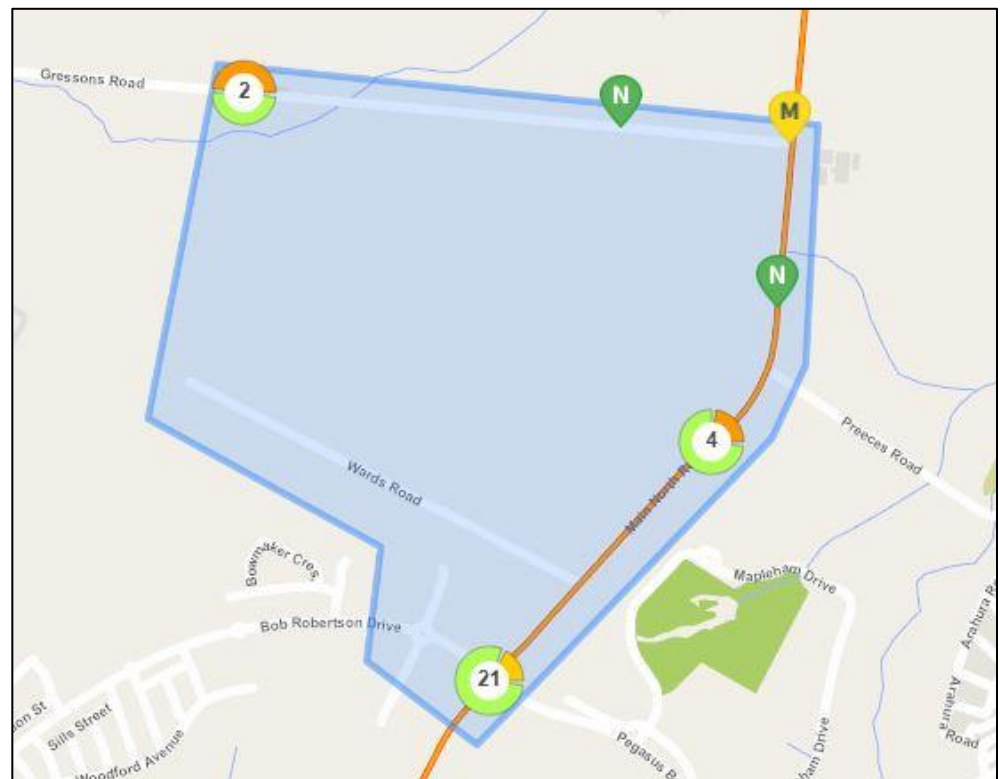


Figure 6-4: Crash Locations and numbers 2018-23 (Oct)

- 6.6 Overall, the nature of the crashes reported does not raise any specific safety concerns with the road network but I have noted that “lost control” was identified as a reason for 15 crashes which all involved a single vehicle only.

7 ROAD NETWORK IMPROVEMENTS

SH1 road safety improvements – Saltwater Creek to Cam River

7.1 As part of the Road to Zero Vision, NZTA have committed to delivering safety improvements to its road network. **Figure 7-1** shows the works proposed for SH1 between Saltwater Creek and the Cam River. Of particular relevance to the Stokes' submissions are the improvements proposed south of Gressons Road which include:

- (a) a flexible Median Safety Barrier;
- (b) a jug-handle turn around south of Gressons Road; and
- (c) left-in / left-out intersections at Preece Road and Wards Road.



Figure 7-1: SH1 Road Safety Improvements - Saltwater Creek to Cam River

7.2 **Figure 7-2** shows the NZTA designation along SH1 to the east of the Site (**NZTA-1**). NZTA-1 would allow for widening of the highway opposite the Preece Road intersection. I understand that the implementation of the median barrier and the conversion of the Wards Road and Preece Road intersections will not require any change to the existing road reserve or alterations to NZTA-1.

7.3 The jug-handle turn around will require land outside of the existing road reserve and the area of NZTA-1.

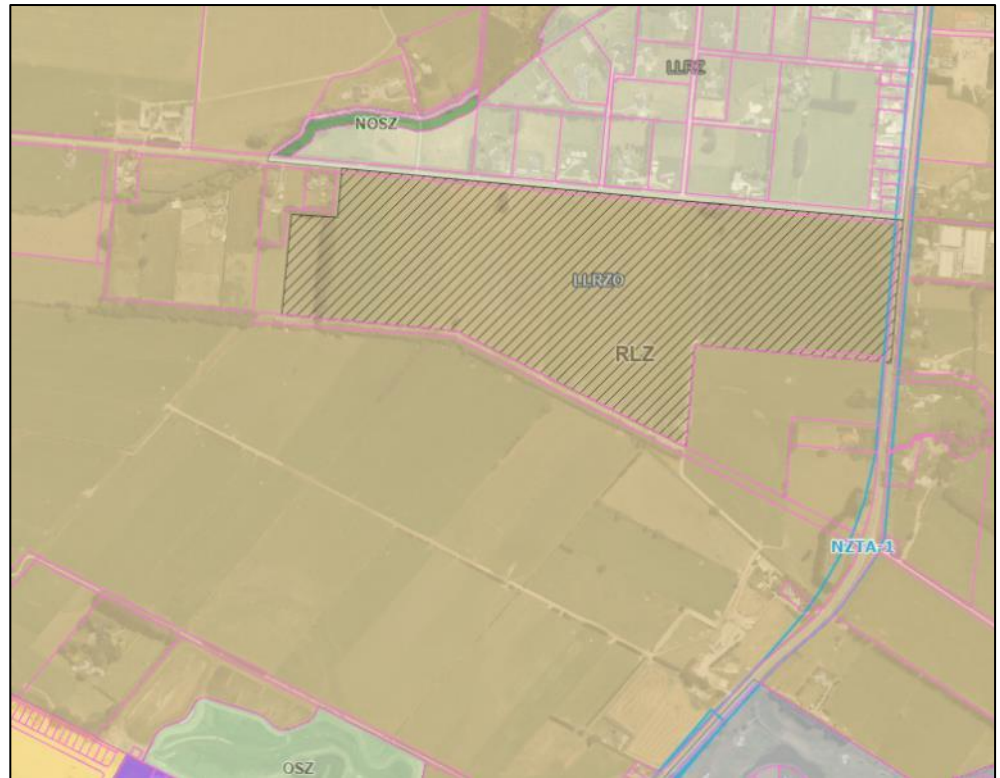


Figure 7-2: NZTA Designation

Woodend Bypass

- 7.4 The Woodend Bypass forms part of the Christchurch North Link improvements which have been identified in the draft Government Policy Statement on Land Transport 2024 (**GPS24**). The draft GPS24 states:

Upgrading State Highway 1 from the Waimakariri River to Ashley River, including a new alignment around Woodend, will improve safety, provide for more reliable journeys, support regional growth and greater accessibility for Woodend and Pegasus. This work could include additional lanes on SH1 from Lineside Road to Cam River and a new bypass alignment around Woodend and potential widening for the Ashley River Bridge. The funding made available in the GPS could enable further detailed design and work could start as early as 2026/27. Construction is expected to take three years to complete.

- 7.5 Although the GPS24 is still to be confirmed, it does indicate a commitment to construction of the Woodend bypass and that this could be completed by about 2030.
- 7.6 **Figure 7-3** shows the alignment of the Woodend Bypass designation. At its northern limit, it will link with SH1 at the Pegasus/Ravenswood roundabout. It rejoins the current SH1 alignment at the SH1 / Williams

Street intersection at the northern end of Kaiapoi. The existing section of Main North Road south of the roundabout will be realigned and meet Bob Robertson Drive at the Kesteven Place roundabout.

- 7.7 Gladstone Road and Woodend Beach Road provide connections from SH1 to land to the east of SH1 and Woodend. The designation plans indicate that both roads will cross the bypass at bridges and have no connections to the bypass.



Figure 7-3: Woodend Bypass Designation (Source: WDC Maps)

8 WAIMAKARIRI 2048 DISTRICT DEVELOPMENT STRATEGY

- 8.1 Figure 8-1 shows the Waimakariri 2048 District Development Strategy for the Woodend/Pegasus area. This shows proposed residential growth directions from the existing residential areas. It indicates that growth north of Ravenswood towards Gressons Road is anticipated.



Figure 8-1: Woodend / Pegasus 2048 Development Strategy

9 NORTH WOODEND (RAVENSWOOD) KEY ACTIVITY CENTRE

- 9.1 Plan Change 30 (**PC30**) to the WODP became operative in June 2023 and will enable development of the emerging KAC in North Woodend (Ravenswood). The WODP Map 158 (**Figure 9-1**) shows that the business zoned land straddles Bob Robertson Drive and extends from SH1 at its eastern limit to its western boundary with Lorimer Street / Aitken Street. Lorimer Street is shown as a Collector Road and Kesteven Place as a Local Road. Although both roads terminate at the edge of the Ravenswood KAC, they have been formed in a manner that would allow for northern extension which I consider is consistent with the Woodend / Pegasus 2048 Development Strategy (refer **Figure 8-1** above).
- 9.2 The Ravenswood KAC comprises about 14 ha of Business 1 zoned land and about 8 ha of Business 2 zoned land. The Business 1 zoned land will provide for town-centre type activities with the Business 2 zoned land being more for industrial and commercial activities. The inclusion of Business 2 zoned land within the KAC is expected to *“increase employment opportunities in the area which will contribute to district wide economic self-sufficiency”*.²

² WDC Operative District Plan Policy 16.1.1.6

- 9.3 The North Woodend (Ravenswood) ODP 158A explanatory text on Pedestrian Linkages states:

The emerging Key Activity Centre is in a location that will be walkable from the Ravenswood residential area, northern part of Woodend, and to a lesser degree the western part of Pegasus.

- 9.4 Although the Ravenswood site does not currently have public transport links, the explanatory text on public transport infrastructure also states:

Ravenswood is anticipated to be directly serviced by bus services and the Outline Development Plan identifies proposed locations for suitable infrastructure to enable people to access the emerging Key Activity Centre by bus. There is also the potential for multiple bus routes to run through or past the emerging Key Activity Centre, particularly when the Woodend Bypass is established.

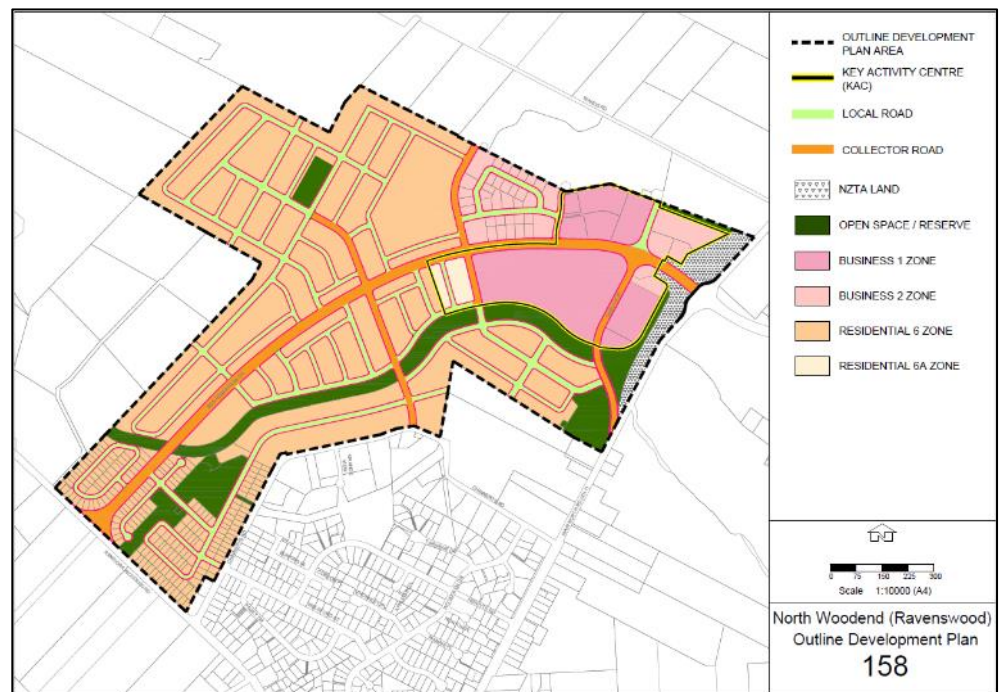


Figure 9-1: Operative District Plan Map 158

10 STOKES' SUBMISSIONS – THE PROPOSAL

- 10.1 **Figure 10-1** shows the proposed ODP for the Site. The road network has been based around two north-south collector roads that will link Gressons Road at the northern limit with Lorrimer Street and Kesteven Place in Ravenswood. Both Lorrimer Street and Kesteven Place meet Bob Robertson Drive at roundabouts. Bob Robertson Drive provides the

primary connection to the strategic road network, SH1 to the east and Rangiora Woodend Road to the south.

10.2 The local road network for the Site will comprise a mix of roads from lanes and low volume roads to higher volume neighbourhood roads which connect to the Collector Roads.

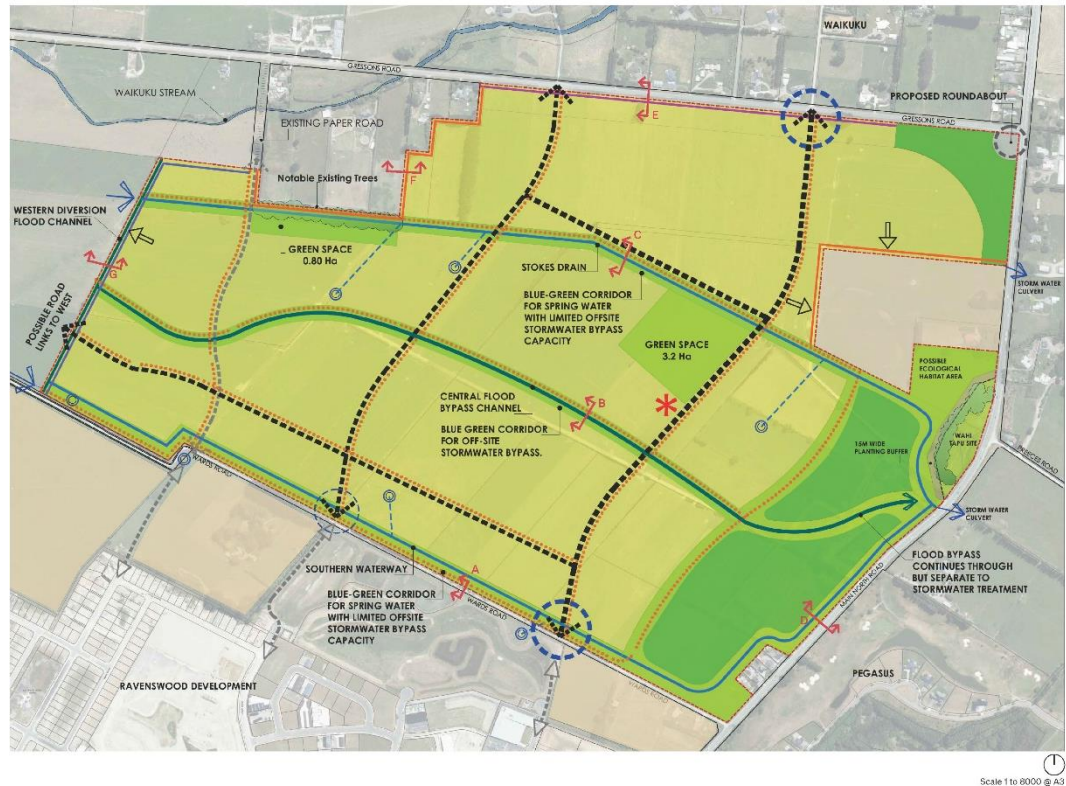


Figure 10-1: Outline Development Plan

10.3 The ODP makes provision for residential development at different densities and includes blue green corridors for recreation and stormwater management. The development potential of the whole Site will depend upon the dwelling densities but it is expected to enable approximately 1,500 new dwellings.

10.4 The ODP does not include any new connections to SH1 but will retain the existing access via Wards Road. This is currently configured as a priority intersection that allows for all turning movements. Waka Kotahi's proposal to install a median barrier on SH1 between the Pegasus roundabout and Gressons Road would result in future turning movements being restricted to left-in / left-out. The right turn demand from the north could then be accommodated by the existing road network at either the Pegasus roundabout or at the Gressons Road intersection.

10.5 Right turn demands from Wards Road would need to be met by internal re-routing and departure via the Pegasus roundabout, Gressons Road or the jug-handle turn facility proposed by Waka Kotahi south of Gressons Road.

11 EXPECTED TRAFFIC GENERATION AND DISTRIBUTION

11.1 For the purposes of this assessment, I have adopted a development scenario for the Site based on 1,500 households but no provision for any new employment opportunities or schools. This provides a conservative basis for the assessment as any new school would reduce the need for children to travel outside the immediate area.

11.2 The typical traffic generation rate of suburban residential activity is about 8 vpd per household but is dependent upon location in relation to education, employment and retail centres and also public transport services. In my opinion, this rate provides an upper limit to what could be generated by the Site. Based on that rate, the Site could generate up to 12,000 vpd.

11.3 The household peak hour traffic generation rate is typically about 0.9 vph with the peaks generally being associated with workplace travel. Travel distances to workplaces will influence departure and return times. In practice, since the larger employment centres are widely distributed from Ravenswood and Rangiora to Kaiapoi and Christchurch, I would expect the peak hour travel demands to be below the typical rate because workplace travel will be distributed over a longer period of time.

11.4 The key routes for travel from the Site will be:

- (a) To/from Rangiora: Gressons Road and Rangiora Woodend Road;
- (b) To/from Kaiapoi: SH1 primarily with some use of Gressons Road and Wards Road; and
- (c) To/from Christchurch: SH1 primarily with some use of Gressons Road and Wards Road.

11.5 Overall, the Site will predominantly be reliant on access to Bob Robertson Drive via Lorrimer Street and Kesteven Place because these form the most direct access routes to employment and activity centres.

12 EXPECTED TRANSPORT EFFECTS

Assessment methodology

- 12.1 The CTM is a four stage transport model that uses land use information and transport network information to forecast the likely travel demands by mode and how the travel demands will be distributed on the network. Given the scale of the Proposal and its proximity to Ravenswood, and in particular the new KAC, I have used the most recently released version of the CTM to investigate the potential transport related effects of the Proposal. The CTM provides a good indication of how vehicle movements generated by the Proposal will be distributed across the transport network.
- 12.2 For the purposes of this assessment, I have investigated the effects of full development of the Site compared with base scenarios that include the Ravenswood KAC.

Ravenswood KAC

- 12.3 The CTM base model includes a single zone that represents the whole of the Ravenswood development but this does not reflect the land use that was recently enabled by PC30. To better understand the potential traffic effects of the Proposal, I arranged for a revision to the base model land use to be created so that the model zone better reflected the KAC. This includes a reduction in the number of households in the Ravenswood zone by 150 and an increase in the number of jobs.
- 12.4 I have examined the land use and employment potential for two zones in the CTM that are potentially representative of the Ravenswood KAC, being Northwood and Ferrymead as shown in **Figure 12-1**. Their land area and the level of employment is shown in **Table 12-1**. I have used this information to calculate an employment density for each zone.



Figure 12-1: Northwood (left) and Ferrymead (right) Key Activity Centres

Table 12-1: CTM Land use Information

Location	Area (ha)	Employment (jobs)	Employment Density (jobs/ha)
Northwood	7.8	327	42
Ferrymead	29.0	1,449	50

12.5 Although Northwood is defined as a KAC in the Christchurch City District Plan, since it largely comprises medium to large format retail only, I do not consider that it will be representative of what is likely to be established in Ravenswood but does provide a useful reference in terms of job density. Ferrymead is not categorised as a KAC but comprises a commercial zone and light industrial zone and provides for similar activities to those enabled by the KAC. The Ferrymead area as a whole includes a much wider range of activities than Northwood such as small scale industrial activities, cafés, bars, gyms and a medical centre. On that basis, I consider that the employment density in the Ferrymead zone is more representative of what is likely to be established in Ravenswood given the types of activity enabled by the Business 1 and Business 2 zones. Based on the Ferrymead job density, I expect the Ravenswood KAC could generate about 1,100 jobs based on an area of 22 ha. For this assessment, I have applied the employment profile from the CTM Ferrymead zone to Ravenswood to reflect the wide range of job types that could be expected.

12.6 I have adopted 2028 as the base year for this preliminary assessment as it forms part of the CTM model suite and represents the earliest that

complete development of the KAC could reasonably be expected. The base year model includes all currently approved residential development in the district.

12.7 **Table 12-2** shows the changes in peak period travel patterns in the CTM for 2028 with and without the KAC expansion. For simplicity, I have grouped all trips either starting or ending in Woodend, Pegasus and Ravenswood as a single combined zone labelled Woodend. During the morning peak period, the KAC results in more local trips within Woodend, more trips entering Woodend and less trips leaving Woodend. I consider that this reflects the increased employment created by the KAC.

12.8 The modelling for the evening peak period also shows more local trips within the KAC, a reduced number of trips entering the zone but more trips leaving the zone. Again, I consider that this reflects the effect of creating a new employment centre in the area.

Table 12-2: 2028 Peak Period Trip Patterns

		7:00-9:00 AM		4:00-6:00 PM	
		Woodend	Other	Woodend	Other
Base	Woodend	204	2,006	312	1,329
	Other	713		2,469	
KAC	Woodend	248	1,904	392	1,527
	Other	832		2,352	
Diff	Woodend	45	(102)	80	197
	Other	118		(117)	

Assessment of the Proposal

12.9 I have investigated the potential change in trip patterns with the full development of the Site with 1,500 households in 2038 and 2048 compared with scenarios that include the KAC but without the Proposal. **Table 12-3** and **Table 12-4** show that the Proposal will increase the overall volume of vehicle movements on the transport network and reflect the higher number of households in the Woodend/Ravenswood area.

12.10 I consider that the forecast increase in total vehicle movements is a direct reflection of the increased number of households. In practice, I would anticipate a smaller increase because the CTM does not take into account the mode shift that would be expected if regular bus services were established between Ravenswood and Rangiora or a more frequent service was established to Christchurch.

Table 12-3: 2038 Forecast Peak Period Travel Demands - with and without the Proposal

		7:00-9:00 AM		4:00-6:00 PM	
		Woodend	Other	Woodend	Other
KAC	Woodend	277	2,356	438	1,759
	Other	930		2,911	
Stokes	Woodend	469	3,284	819	2,163
	Other	1,093		4,001	
Diff	Woodend	192	928	380	404
	Other	163		1,089	

Table 12-4: 2048 Forecast Peak Period Travel Demands - with and without the Proposal

		7:00-9:00 AM		4:00-6:00 PM	
		Woodend	Other	Woodend	Other
KAC	Woodend	309	2,748	491	1,956
	Other	1,020		3,389	
Stokes	Woodend	497	3,677	877	2,360
	Other	1,189		4,440	
Diff	Woodend	187	929	386	404
	Other	169		1,051	

12.11 Although the total number of vehicle trips increases with the Proposal, there will be an increasing proportion of shorter, local trips. With no Proposal, about 8 % of all trips starting within the Woodend area are forecast to remain within the Woodend area. The proportion of local trips is forecast to increase to over 10 % with the Proposal. With more short trips, there is a greater likelihood of some trip makers choosing to use an alternative travel mode such as walking or cycling which will reduce vehicle trips on the network. The proposed establishment of a local bus service will also contribute to reducing the number of vehicle trips on the network.

12.12 **Appendix A** to my evidence includes road volume difference plots for 2048 and 2038 morning and evening peak periods. During the peak periods, about 30% of all trips are towards or from Rangiora and about 60% use the Woodend Bypass towards or from the South (Kaiapoi and Christchurch). This could add 300-400 vph to Bob Robertson Drive during the morning and evening peak hours.

12.13 The CTM reports that the Level of Service provided by intersections in the Waikuku / Ravenswood / Pegasus / Woodend area will be LOS C or better in 2038 with full development of the Site (**Appendix B**). The CTM

indicates that the Pegasus roundabout could be operating at LOS D in the evening peak period by 2048. In practice, I would expect the operating performance of all intersections to be improved if public transport services are established for Ravenswood and the local area as this would contribute to reducing the private vehicle mode share and the total number of vehicle movements. Additional services are indicated in the Greater Christchurch Spatial Plan.

12.14 Residential development across the northern part of the Site enabled by the Proposal is likely to increase traffic volumes on Gressons Road as this will provide the most direct route to the wider arterial and strategic road network. One potential consequence is a higher demand for the right turn to the south from Gressons Road and also right turns from the north which could result in a higher incidence of crashes, particularly side-impact crashes causing serious injuries. In practice, I do not consider that the change in turning volumes would substantially change the safety rating of the existing intersection under the Safe System Assessment Framework (**SSAF**). The existing priority controls and speed environment means that the current intersection design is not aligned with SSAF best practice. Improving the alignment with the SSAF could be achieved with a roundabout since this represents a primary safety treatment for a high speed intersection under the SSAF. I have investigated how a roundabout could be formed in this location given the existing land constraints.

12.15 **Appendix C** to my evidence includes a concept design for a roundabout at the SH1 / Gressons Road intersection. The design requires that Gressons Road is re-aligned so that all approaches meet desirable design criteria. The ODP has been structured so that a roundabout of this form could be constructed in the future.

12.16 I have noted that construction of a roundabout would remove the need for the jug-handle turning facility south of Gressons Road that forms part of the Waka Kotahi Speed and Infrastructure Programme (**SIP**) works for SH1.

12.17 The modelling results do not indicate any capacity issues with the SH1 / Gressons Road intersection. However, conversion of the intersection to a roundabout would improve safety and be complementary to the NZTA SIP works on the SH1 corridor. I consider that sufficient land within the

Site should be protected from residential development to allow for future construction of a roundabout but that a roundabout is not required to support the Proposal.

12.18 Although Wards Road represents the only direct access to the state highway from the Site, in my opinion, the proposed changes to the intersection to restrict movements to left-in and left-out means that this will only operate as a secondary access route compared to the access routes via Bob Robertson Drive and Gressons Road. It will attract some inbound movement from the south because this will enable a more direct route to areas in the south-east of the Site compared with Bob Robertson Drive. It may also provide a more direct route for travel to the north for the residents in the south-eastern part of the Site compared with travel via either Bob Robertson Drive or Gressons Road.

12.19 Although the Site is located adjacent to the Ravenswood KAC, Rangiora and Kaiapoi represent the nearest major employment / retail centres with Christchurch being the dominant employment / retail centre in the wider area. This will increase travel demands on Gressons Road, Rangiora Woodend Road and also on SH1 south of the Site (Woodend Bypass). Even without the proposed new bus services, the modelling results suggest that development of the Site with 1,500 households can be accommodated on the road network. On that basis, I have concluded that the full development of the Site would not contribute to transport effects that could not be accommodated by the future transport network and that there are no transport reasons for precluding the proposed zoning as sought through the Proposal.

12.20 The planned introduction of new public transport services in the area will contribute to reducing the modelled travel demands.

13 NATIONAL POLICY STATEMENT – URBAN DEVELOPMENT 2020

Objective 1 - Well Functioning Urban Environments

13.1 Objective 1 of the NPS-UD seeks:

well-functioning urban environments that enable all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future.

13.2 From a transport perspective, I consider that the relevant policies for creating a well-functioning urban environment are:

Policy 1: Planning decisions contribute to well-functioning urban environments, which are urban environments that, as a minimum:

(c) have good accessibility for all people between housing, jobs, community services, natural spaces, and open spaces, including by way of public or active transport; and

(e) support reductions in greenhouse gas emissions.

13.3 The ODP comprises road, pedestrian and cycle networks which will provide a high level of connectivity both within the new residential area but also to the surrounding transport networks. The footpaths on the proposed new roads will link to existing footpaths within Ravenswood. Connecting the cycle network within the Site to the existing cycle facilities on Bob Robertson Drive will require some new facilities to be constructed on Kesteven Place and Lorrimer Street.

13.4 Although there are no public transport services on Bob Robertson Drive currently, the establishment of the Ravenswood KAC would make this a suitable destination for a new service. The grid style road network proposed by the ODP would also enable any new service route to be extended into the Site to provide convenient access for residents. The timing for implementation of any new service will be influenced by the rate of development in the area as it may not be economically viable to operate a service until there is a substantial established population.

13.5 The proposed establishment of residential development close to the Ravenswood KAC means that a high proportion of trips for employment or retail can be made by modes other than a private vehicle. The Site also provides access to the Christchurch public transport service which can be used for employment based travel. Together, I would expect these factors to contribute to a reduction in greenhouse gas emissions compared with residential development of rural land without access to bus services or convenient access to retail and employment.

Objective 3 – Employment and Servicing

13.6 Objective 3 of the NPSUD states:

Objective 3: Regional policy statements and district plans enable more people to live in, and more businesses and community services to be located in, areas of an urban environment in which one or more of the following apply:

(a) the area is in or near a centre zone or other area with many employment opportunities

(b) the area is well-served by existing or planned public transport

(c) there is high demand for housing or for business land in the area, relative to other areas within the urban environment.

13.7 **Figure 13-1** shows the location of the Site with respect to the Ravenswood KAC. It shows that about half of the Site will be within one km of the KAC (which is closer than Woodend) and that the whole Site is within two km of the KAC (which is closer than many parts of Pegasus and Waikuku). Since the KAC could provide employment opportunities for about 1,100 people, I consider that this demonstrates that the Site is close to an area with many employment opportunities.



Figure 13-1: Proximity to Key Activity Centre

13.8 **Figure 5-6** earlier in my evidence shows that none of the existing bus services travel along Bob Robinson Drive through Ravenswood. The closest bus stops to Ravenswood and the Site are on Pegasus Boulevard immediately east of SH1 as shown on **Figure 13-2**. Those bus stops serve both Route 95 which links Waikuku Beach with Christchurch via

Kaiapoi and Route 97 which links Pegasus with Rangiora via Woodend. Both services operate hourly on weekdays.

13.9 Since the NPS-UD does not define “well-serviced”, I have sought advice from Stantec’s practice lead for public transport planning³ on how this could be interpreted. He advised that the quality of a public transport service is broadly dependent upon the frequency of a service and the walking distance to access a service. In light of that advice, “well-serviced”, in my opinion, means a high quality bus service that is high frequency and has a short walking distance to bus stops.

13.10 **Table 13-1** provides a comparative rating tool for the quality of a bus service based on walking distance to a bus stop and the bus stop frequency in terms of headway (interval between buses). Based on this rating table, the existing bus services for Woodend and Pegasus would be rated as low quality due to their low frequency even though bus stops are generally within 500 m of residential development.

Table 13-1: Comparative Public Transport Servicing Rating Scheme

Headway (minutes)	Average residential Bus stop access distance (by foot)		
	> 800 m	501-800 m	<= 500 m
> 30	Low	Low	Medium
16 – 30	Low	Medium	High
<= 15	Medium	High	High

13.11 Although provision of a high quality bus service is practical within large urban centres, I understand that the levels of patronage that can be achieved in smaller centres typically means that operating a high frequency service may not be commercially viable.

13.12 I anticipate that there will be a demand for a public transport service to provide access to the KAC in the future and that this could operate at higher frequencies at peak times to enable a higher quality of service. If such a service was established, I consider that an extension into the Site would be consistent with the Pegasus public transport service³ since there could be more households developed on the Site (1,500 dwellings) than are in Pegasus (about 1,000 dwellings in 2018 census).

³ Doug Weir, Senior Principal Transport Planner, Practice Leader Public Transport, Stantec NZ.

13.13 Overall, I consider that there are no reasons why the Site could not be “well-serviced” by public transport in the future.



Figure 13-2: Existing Bus Stop Locations

14 PROPOSED DISTRICT PLAN

14.1 I have considered the Proposal against the relevant notified PDP provisions relating to subdivision and transport.

Subdivision

Objective SUB-01: Subdivision Design

Subdivision design achieves an integrated pattern of land use, development, and urban form, that:

- 1. provides for anticipated land use and density that achieve the identified future character, form or function of zones;*
- 2. consolidates urban development and maintains rural character except where required for, and identified by, the District Council for urban development;*
- 3. supports protection of cultural and heritage values, conservation values; and*
- 4. supports community resilience to climate change and risk from natural hazards.*

14.2 The Site is located between the existing residential areas of Waikuku and Ravenswood. I consider that the Proposal will contribute to linking the two areas in an integrated manner from a transport perspective and is in a location that is consistent with providing easy access to the Ravenswood KAC.

14.3 Overall, I consider that the Proposal is consistent with the transport related aspects of this objective.

Objective SUB-O2: Infrastructure and Transport

Efficient and sustainable provision, use and maintenance of infrastructure; and a legible, accessible, well connected transport system for all transport modes.

14.4 The ODP for the Proposal includes a Collector Road network that will allow local roads to be constructed in a manner that ensures all new dwellings are located within 400 metres of the Collector Road network. This will enable efficient travel through the new network and also provide onward connections to the existing, wider transport infrastructure.

14.5 The Collector Road network will also provide a good basis for developing cycle routes that can connect to District wide facilities such as the cycle paths to Rangiora and to Kaiapoi.

14.6 Gressons Road forms one of the primary connections between SH1 and Rangiora. While the Proposal does not affect the operational performance of the SH1 / Gressons Road intersection, I have noted that if an upgrade to the intersection by way of the installation of a roundabout was required, it would not be possible to construct one on the SH1 centreline without purchasing land to the east of SH1 or on the northwest corner of the intersection. Any new roundabout would need to be constructed with an offset into the proposed residential zone to meet the geometric design requirements. **Appendix C** includes a concept design for a roundabout which demonstrates that this can be achieved. The ODP for the Site has been developed so that the land required for a roundabout is protected from development.

Transport

Objective TRAN-O1: A safe, resilient, efficient, integrated and sustainable transport system

An integrated transport system, including those parts of the transport system that form part of critical infrastructure, strategic infrastructure, regionally significant infrastructure, and strategic transport networks, that:

- 1. is safe, resilient, efficient and sustainable for all transport modes;*
- 2. is responsive to future needs and changing technology;*
- 3. enables economic development, including for freight;*
- 4. supports healthy and liveable communities;*
- 5. reduces dependency on private motor vehicles, including through public transport and active transport; and*
- 6. enables the economic, social, cultural and environmental well-being of people and communities.*

14.7 The transport networks proposed by the ODP will provide good connectivity for all transport modes both within the Site and to the external transport networks. Although no new bus services are currently proposed through Ravenswood, the collector roads within the ODP could form part of a new service if a new service was established.

14.8 Since the Site is generally level, I consider that there are no topographic constraints that would prevent new roads being designed to best practice design standards so that they can operate safely and efficiently.

14.9 Since the Site is located close to the Ravenswood KAC, walking and cycling will be practical travel mode choices for many people which will reduce the dependency on motor vehicles for short trips. The KAC will also act as an employment centre which will reduce the need for some residents to drive to their workplace.

15 CONCLUSIONS

15.1 The Proposal seeks a residential zoning of the Site which would enable development of up to 1,500 dwellings close to the Ravenswood KAC. The

Site has good access to the wider strategic road network via Gressons Road and Bob Robertson Drive within Ravenswood.

- 15.2 The internal roads will provide easy access for pedestrians, cyclists and motor vehicles to the Ravenswood KAC which will provide employment opportunities and also a wide range of retail facilities. Gressons Road also provides a connection to employment and retail in Rangiora. SH1 will provide the primary link for travel to Kaiapoi and Christchurch to the south.
- 15.3 The establishment of additional residential activities close to the Ravenswood KAC will increase the proportion of local trips made in the Woodend / Ravenswood / Pegasus / Waikuku area which will contribute to reducing greenhouse gas emissions relative to otherwise establishing a similar number of dwellings in a more rural location.
- 15.4 The proposed road network will also allow any future bus services for Ravenswood to be easily extended into the residential zone which will contribute to reducing both vehicle trips and greenhouse gas emissions.
- 15.5 My investigation of potential transport effects using the CTM does not raise any concerns with the operation of the existing road network. Even without any new bus services being established, the modelling results suggest that development of the Site with 1,500 households can be accommodated on the existing road network with intersection LOS generally being C or better. The only exception is the SH1 / Bob Robertson Drive / Pegasus Boulevard intersection which may operate at LOS D during the evening peak by 2048.
- 15.6 Overall, I have concluded that the full development of the Site would not result in transport effects that could not be accommodated by the future transport network and that there are no transport reasons to preclude the proposed rezoning as sought through the Proposal.

Chris Rossiter

4 March 2024

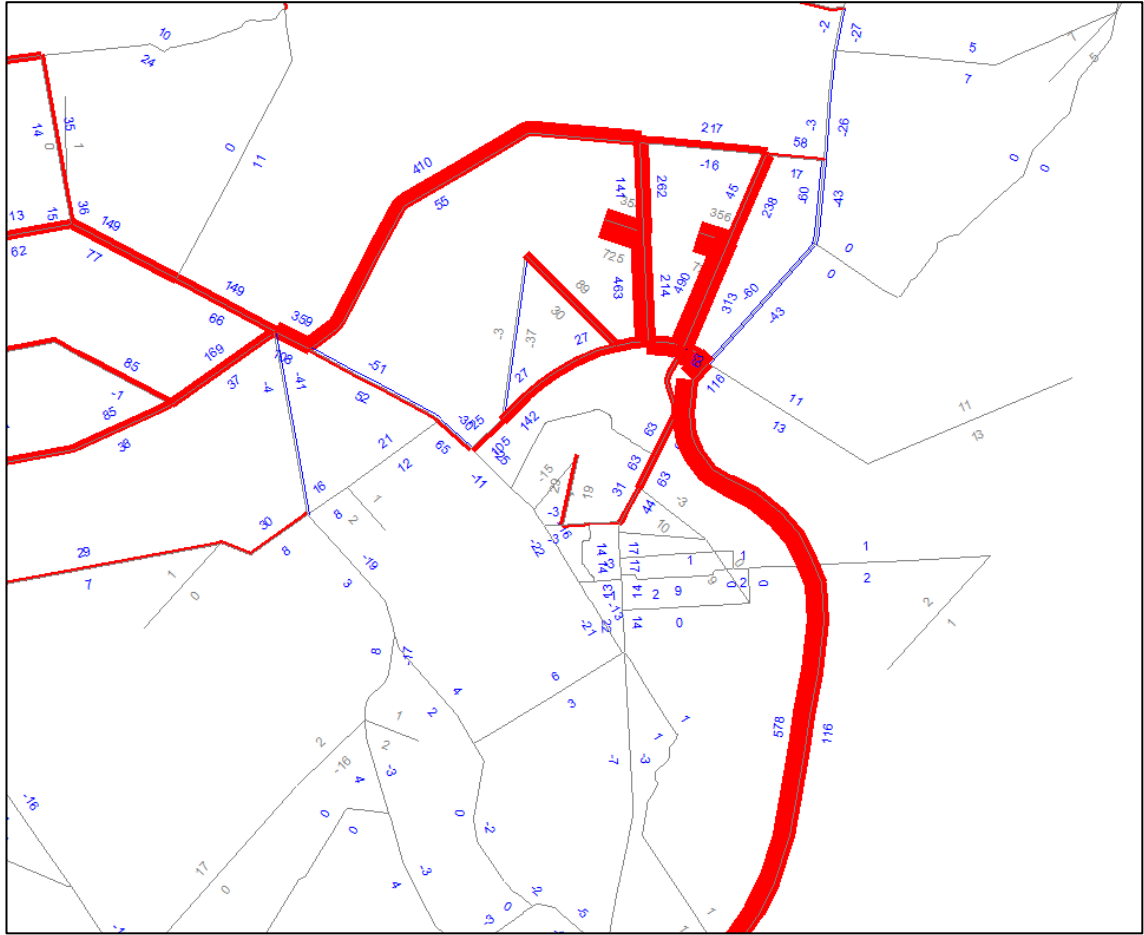


Figure 15-2: 2038 PM Peak Period Difference Plot

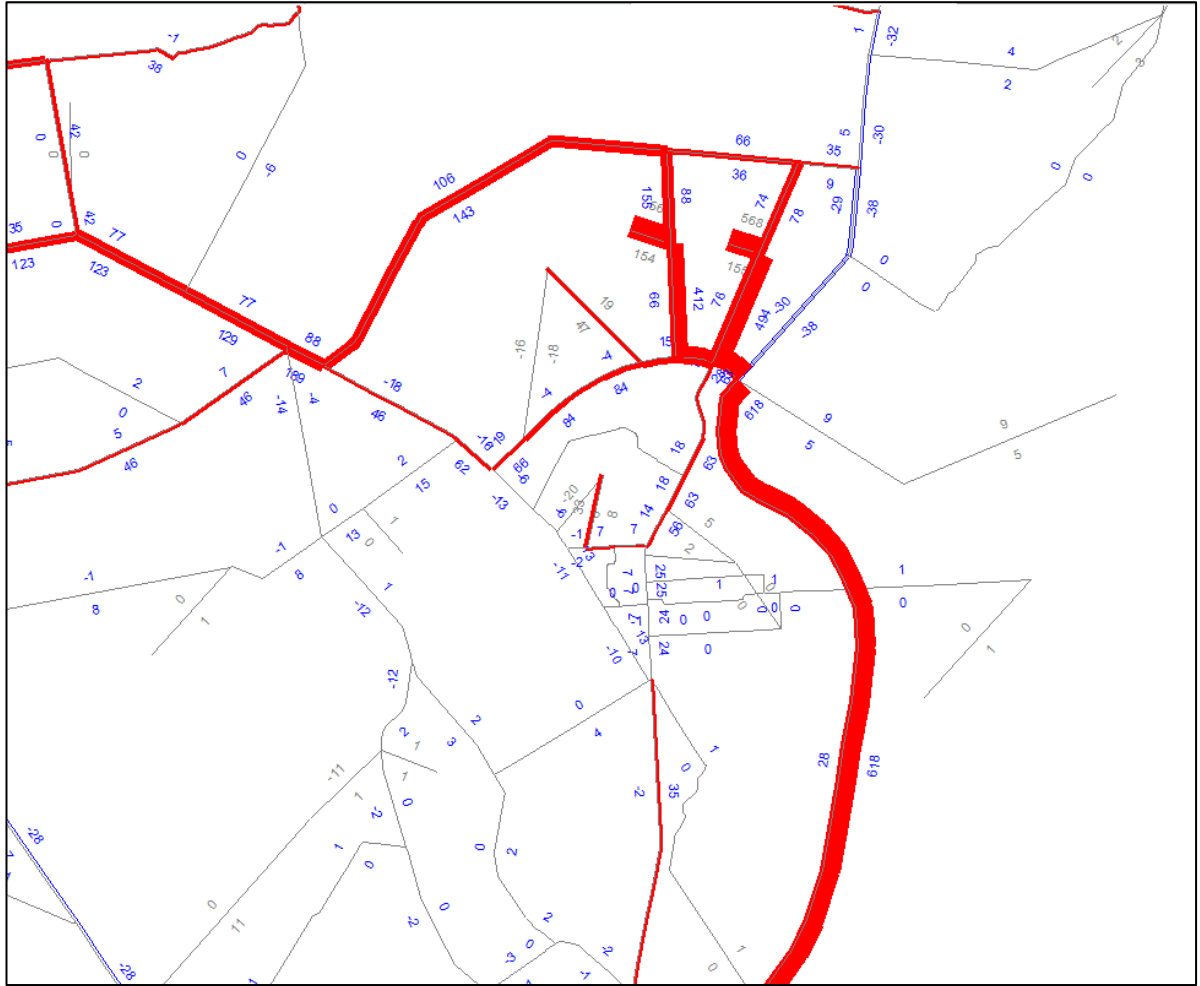
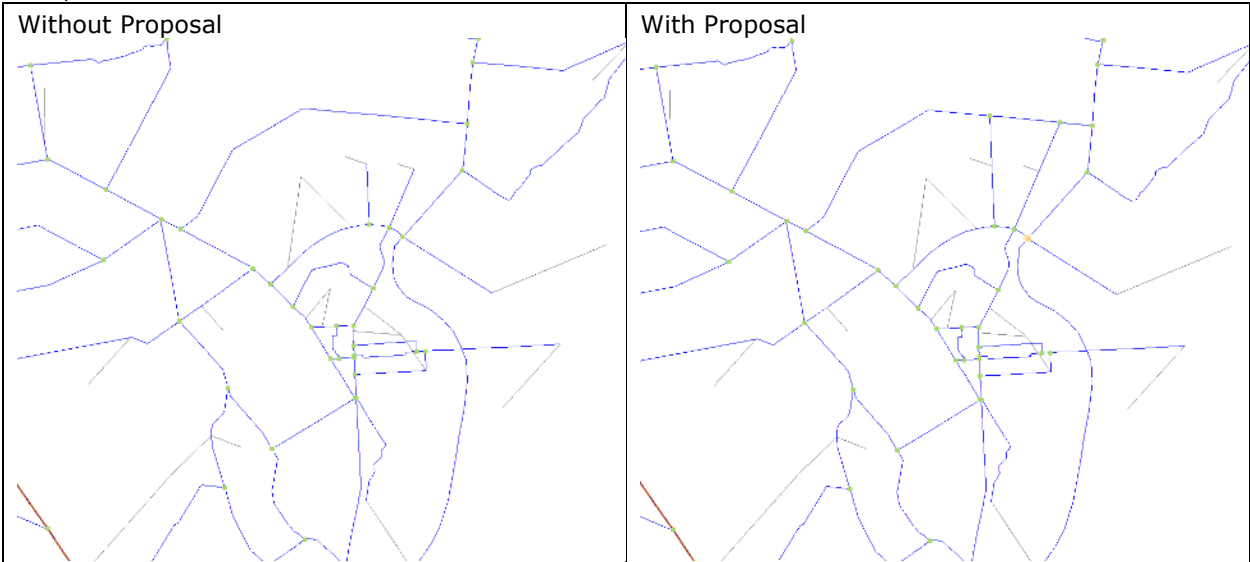


Figure 15-3: 2048 AM Peak Period Volume Differences

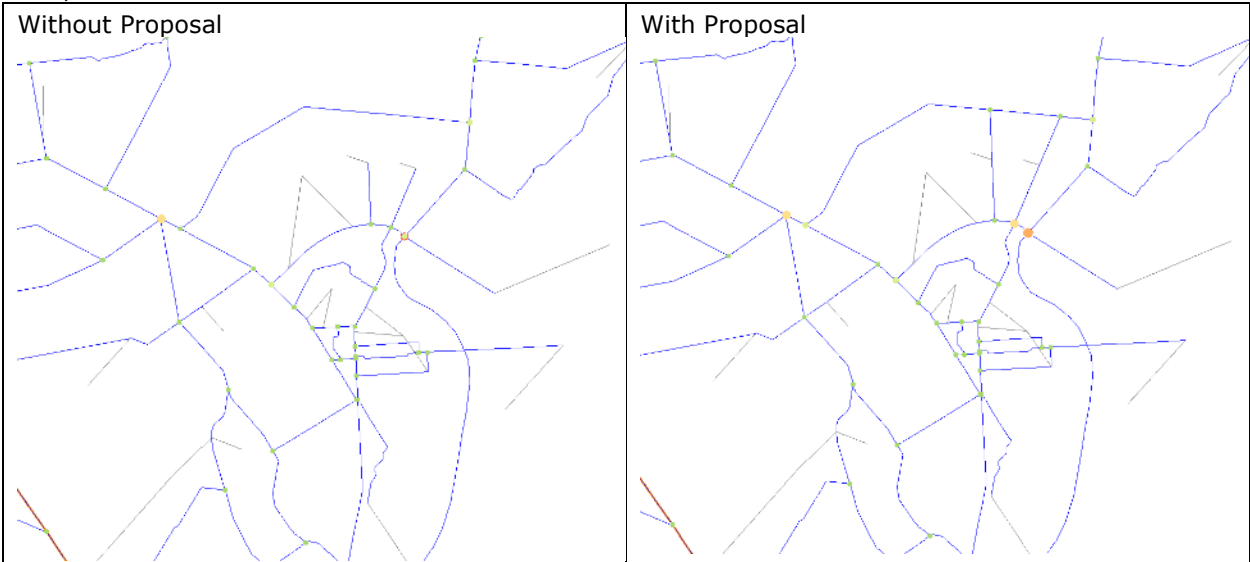
Appendix B : CTM Level of Service Plots

2048, AM



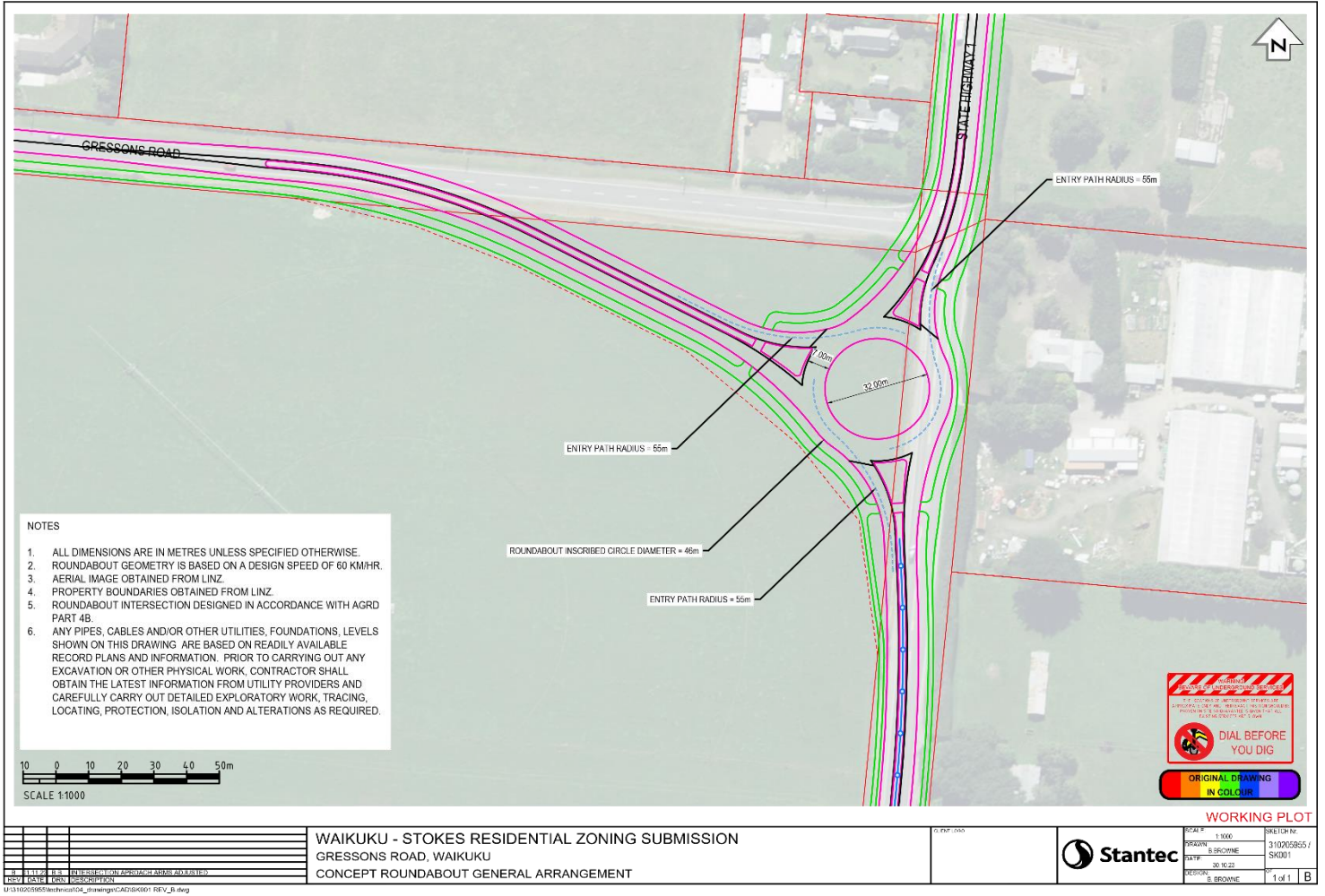
Pegasus roundabout changes from LOS A to LOS C

2048, PM



Pegasus roundabout changes from LOS B to LOS D

Appendix C: SH1 / Gressons Road roundabout concept design



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