

BEFORE THE HEARINGS PANEL

IN THE MATTER

of the Resource Management
Act 1991

AND

IN THE MATTER

of the Proposed District Plan
for Waimakariri District

HEARING STREAM 12C: LARGE LOT RESIDENTIAL ZONING

**STATEMENT OF EVIDENCE OF ANDREW DAVID CARR
(TRAFFIC AND TRANSPORTATION)**

ON BEHALF OF

RAINER AND URSULA HACK (SUBMITTER #201)

5 JULY 2024

1. INTRODUCTION

- 1.1 My name is Andrew (“Andy”) David Carr.
- 1.2 I am a Chartered Professional Engineer and an International Professional Engineer (New Zealand section of the register). I hold a Masters degree in Transport Engineering and Operations and also a Masters degree in Business Administration.
- 1.3 I served on the national committee of the Resource Management Law Association between 2013-14 and 2015-17, and I am a past Chair of the Canterbury branch of the organisation. I am also a Chartered Member of Engineering New Zealand (formerly the Institution of Professional Engineers New Zealand), and an Associate Member of the New Zealand Planning Institute.
- 1.4 I have more than 34 years’ experience in traffic engineering, over which time I have been responsible for investigating and evaluating the traffic and transportation impacts of a wide range of land use developments, both in New Zealand and the United Kingdom.
- 1.5 I am presently a director of Carriageway Consulting Limited, a specialist traffic engineering and transport planning consultancy which I founded more than ten years ago. My role primarily involves undertaking and reviewing traffic analyses for both resource consent applications and proposed plan changes for a variety of different development types, for both local authorities and private organisations. I have previously been a Hearings Commissioner and acted in that role for Waimakariri District Council, Christchurch City Council, Ashburton District Council and Greater Wellington Regional Council.
- 1.6 Prior to forming Carriageway Consulting Limited I was employed by traffic engineering consultancies where I had senior roles in developing the business, undertaking technical work and supervising project teams primarily within the South Island.
- 1.7 My experience includes providing transportation assessments for proposed residential subdivisions and private plan change requests. Relevant experience includes providing technical inputs to, and presenting evidence for, the following plan changes, which range from 50 to 2,000 residential lots:

- (a) Within Waimakariri District: Transportation Assessments and advice for Plan Changes 11&12 (Ruby Views), 17 (Ohoka), 22 (McHughs Road), and 23 (Fernside)
- (b) Within Selwyn District: Transportation Assessments and advice for Plan Changes 24 (Silverstream), 34 (Southbridge), 36 (Conifer Grove), 41 (Shands and Trents Road), 60 (Kirwee), 61 (Darfield), 62 (Leeston), 64 and 70 (Faringdon) and 77 (West Melton).
- (c) Within Christchurch City: Plan Changes 30 (Prestons) and 68 (Halswell)
- (d) Within Queenstown Lakes District: Transportation Assessments and advice for Plan Changes 4 (North Three Parks), 18 (Mount Cardrona), 25 (Kingston), 39 (Arrowtown South), 41 (Shotover Country), 45 (Northlake), and 53 (Northlake).
- (e) Central Otago: Plan Changes 12 (Wooing Tree), 13 (River Terrace), and 14 (Ripponvale)

1.8 I have also provided Transportation Assessments for numerous large and small scale residential subdivision applications, as well as for submitters seeking residential land rezonings through the review processes of the Waimakariri, Selwyn, Queenstown Lakes and Central Otago District Plans.

1.9 As a result of my experience I consider that I am fully familiar with the transportation characteristics of the type of activities that could establish if the submission is accepted and the site is rezoned as sought.

2. CODE OF CONDUCT

2.1 Although this is a Council hearing, I confirm I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2023 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this 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 that I express.

3. SCOPE OF EVIDENCE

- 3.1 I have been engaged by the submitter, Rainer and Ursula Hack (submitter #201) to provide transportation advice in respect of their submission for the rezoning of 110 Parsonage Road, Woodend for more intensive residential purposes (either Large Lot Residential Zone, General Residential, Medium Density Residential, or a combination of these).
- 3.2 In order to ensure that all relevant transportation matters were identified and considered, I prepared a Transportation Assessment for the scale of development which I have been told could arise if the submission is accepted (that is, up to 35 residential units). The Transportation Assessment is attached as Annexure A and I adopt this report for the purposes of this evidence, subject to any points of difference, clarification or addition detailed below. The first part of my evidence summarises the key outcomes of the Transportation Assessment
- 3.3 I have also been asked to review and respond to the s 42A report of the Council, including the response to the Hearing Panel's questions that are relevant to the submission site. This forms the second part of my evidence.

4. SUMMARY OF TRANSPORTATION ASSESSMENT

- 4.1 Below I summarise the results of my assessment of the transportation effects arising from the site rezoning as sought by the submitter.
- 4.2 The site is located towards the east of Woodend, at the eastern end of Parsonage Road. There are two means of access to the site, via Parsonage Road or McQuillan Avenue, both of which connect to Main North Road (part of State Highway 1) at priority 'stop' intersections. To ensure a robust analysis, I arranged for weekday morning and evening peak hour traffic surveys to be undertaken in both locations.
- 4.3 The results of these showed that the right-turn movement from both intersections presently experiences a poor level of service at peak times (Level of Service F, on a scale of A to F) and average delays of more than a minute per vehicle.
- 4.4 The survey results also showed that the peak hours on the highway did not occur at the same time as the peak traffic generation of the residential

development on Parsonage Road and McQuillan Avenue. One plausible explanation for this is that a proportion of residents choose to travel slightly earlier or later to avoid the busiest times on the highway and the consequential delays.

- 4.5 Consequently, the Transportation Assessment considers two scenarios, the peak hour as determined by the highest traffic flows associated with the existing residential development on Parsonage Road and McQuillan Avenue, and the peak hour as determined by the highest traffic flows on the highway.
- 4.6 From site visits, I found that the current geometries of the formation of Parsonage Road and McQuillan Avenue, and their intersections with the highway, are appropriate for the current level of activity, although there is a slight shortfall in the sight distance to the north at the Main North Road / Parsonage Road intersection. I do not consider that this is material, and the road safety record does not indicate that it has contributed to any adverse crash record at this location.
- 4.7 Because the proposal is for a rezoning, there is no specific 'scheme' as such to test. Accordingly I was instructed by Mr Warmington to assess the effects of a subdivision of 35 residences.
- 4.8 In order to do this, I adopted a peak hour traffic generation rate of 0.9 vehicle movements per residence (two-way), based on the rate for 'outer suburban' dwellings set out in NZTA Research Report 453 ('Trips and Parking Related to Land Use). In passing, I note that this is consistent with the rate used by my traffic engineering colleagues, Mr Gallot for Crichton Developments Limited (submitter 299), Mr Smith for the Prossers (submitter 224) and Mr Rossiter for the Stokes (submitter 211).
- 4.9 Thus at the peak hour generation of the development anticipated, an additional 32 vehicle movements would be generated on the road network.
- 4.10 I assigned these vehicles as per the current directions of traffic observed during the surveys turning to and from Parsonage Road and McQuillan Avenue. However I made two adjustments, to recognise that drivers would choose the shortest route. For example, drivers would be more likely to exit the site and turn left from Parsonage Road than travelling northwards to turn left at McQuillan Avenue, which would add an extra 600m onto their

journey. Hence any expected left-turn movement from McQuillan Avenue was instead added onto Parsonage Road.

- 4.11 As set out above, there are two scenarios considered – the peak hour determined by the highest traffic flows generated by the existing residential development on Parsonage Road and McQuillan Avenue, and the peak hour as determined by the highest traffic flows on the highway. For the first of these, the basic peak hour traffic generation of the site was assigned into the network.
- 4.12 For the second scenario though, the traffic generation of the site was factored down in accordance with the lower volumes observed on Parsonage Road and McQuillan Avenue at that time. For example, if 10 vehicles were seen on Parsonage Road at the time of the peak traffic flow on that road, but only 5 vehicles were seen on Parsonage Road at the time of the peak traffic flow on the state highway, then the traffic generated by the site was reduced by 50%. This recognises that at the peak times on the highway, the traffic generation of the existing residential development (and therefore of the site) will be lower.
- 4.13 This yields a total of 8 scenarios that were tested:
- (a) morning and evening peak hours;
 - (b) peak hour determined by state highway, and peak hour determined by maximum volumes on the side roads
 - (c) two intersections being modelled (Main Morth Road / Parsonage Road and Main North Road / McQuillan Avenue).
- 4.14 In each of the 8 cases, the modelling showed that the effects of the traffic generated by the rezoned site were minimal. Even in the very worst case, the queue increased by just 0.2 vehicle lengths, with an increase in delay of 1.6 seconds per vehicle. However for 70% cases where delays are expected to increase, the increase is no more than half a second. I consider that it is unlikely that these differences will be perceptible to drivers.
- 4.15 Where land is to be rezoned, it is common to assess a notional ‘design year’ of ten years into the future. In this case however, within this timeframe it is likely that the Woodend Bypass will be constructed. This

was designated as a Road of National Significance in the June 2024 Government Policy Statement on Land Transport. While details of funding and timing are not included within this Policy Statement, such roads are stated to be “*priorities for the government*” and are expected to be delivered “*as quickly as possible*” with an expectation that their funding will be “*prioritised*” by NZTA.

- 4.16 Data previously presented by NZTA in respect of the Woodend Bypass indicates that up to 80% of the traffic on Main North Road could be removed by the scheme¹. Although this figure is nearly 10 years old and may now be different (as Mr Gregory points out, discussed further below), it shows that the effect on the bypass on through traffic is expected to be substantial. This will have a significant effect on improving delays at all intersections on Main North Road (which is also one of the stated aims of the bypass).
- 4.17 In my view then, if development of the site was to happen quickly, then in the short-term the additional traffic would have imperceptible effects on the efficiency of the Main North Road / Parsonage Road and Main North Road / McQuillan Avenue intersections. In the medium to longer term, the reductions in traffic on Main North Road due to the Woodend Bypass will vastly improve the available capacity at both intersections, reducing current levels of delay substantially.
- 4.18 With regard to the formation of the roads, the legal widths of Parsonage Road and McQuillan Avenue are both sufficient to accommodate any necessary improvement measures arising from the increase in traffic, including any measures for pedestrians or cyclists. However I consider that the details of this are a matter for assessment at the time that subdivision consents are lodged.
- 4.19 With regard to walking and cycling, It is typically accepted that people will walk a maximum of 1km to reach a particular destination, and will cycle a maximum distance of 3km². Consequently the site lies within a viable non-car travel distance of many of the amenities in Woodend, including the Local Centre Zone located on the western side of Main North Road, just south of Parsonage Road, and Woodend School.

¹ <https://www.nzta.govt.nz/media-releases/woodend-corridor-designation-to-be-notified/>

² Government strategy, ‘Getting there – on foot, by cycle’

- 4.20 I used the NZTA Crash Analysis System to assess reported crashes on Parsonage Road, McQuillan Avenue, and their intersections with the highway. This showed that four crashes had been reported, one of which involved an intoxicated driver and another involved a driver who fell asleep.
- 4.21 I do not consider that the historic pattern of crashes indicates any inherent road safety deficiency in the immediate area, as the crashes all occurred with different contributing factors, in different locations or with different vehicle movements involved. No crashes involved vehicles turning to or from either Parsonage Road or McQuillan Avenue, and no crashes were recorded on either Parsonage Road or McQuillan Avenue themselves (although I acknowledge that McQuillan Avenue has only recently been constructed).
- 4.22 Accordingly, I do not consider that there is any reason to expect that traffic generated by the rezoned site would give rise to an adverse road safety effect. There is no evidence of any existing road safety issues in the immediate area, and the proposal represents an increase of less than 1.5% over and above current peak hour volumes on Main North Road, meaning that it is very unlikely in my view that there will be any effect on the safety of the wider highway.
- 4.23 I have also considered whether the proposal would result in any inevitable non-compliances with the provisions of the District Plan. On the basis of my review, I consider that a complying subdivision layout can be achieved. However I also note that development will trigger Rule TRAN-R20 (High Traffic Generators) as 35 residences will generate more than 200 vehicle movements per day. Accordingly, when resource consents are sought a Transportation Assessment will be required as part of the application, and so the Council retains the ability to consider traffic matters at that time.
- 4.24 I concluded the Transportation Assessment by saying that on the basis of my evaluation, I considered the rezoning can be supported from a traffic and transportation perspective and that there are no traffic and transportation reasons why the zoning is inappropriate in this location.

5. RESPONSE TO COUNCIL OFFICER REPORTS

- 5.1 I have reviewed the s 42A report of Mr Buckley, Council's planner in respect of this site. His comments are set out in his paragraphs 438 to 443, but transportation matters are not discussed.
- 5.2 With regard to transportation matters generally, Mr Buckley relies on the evidence of Mr Binder and Mr Gregory (Appendix F to the s 432A report). However neither of them mention the site.
- 5.3 In the absence of any direct comment, it is relevant in my view to consider the comments made by the Officers in respect of submission 299 (Crichton Developments Limited) because this site is also proposed to be served by a priority intersection onto Main North Road, is located in Woodend, and it is specifically considered by Mr Gregory. For clarity, I have considered the principles of the matters that he raises rather than any site-specific details.
- 5.4 Mr Gregory sets out (his paragraph 65) that in his view, there is a "*lack of capacity*" on Main North Road in Woodend for any additional traffic to be accommodated. My analysis however shows that the traffic generated by the site at Parsonage Road would have only a minimal effect on queues and delays at the intersections that will be most affected by the rezoning.
- 5.5 Mr Gregory also raises road safety concerns, noting that as delays for drivers increase, drivers start to accept shorter gaps in the traffic stream (his paragraph 67.2) which then increases the risk of a collision. I generally agree with his views in respect of reduced gap acceptance, but I highlight that the increase in delay arising from development of the site is extremely small, and so in my view there will be minimal effect on the changes in driver behaviour over and above the current situation. I also note that the crash record does not indicate any reported crashes involving drivers turning to or from Parsonage Road (or McQuillan Avenue, although I acknowledge that this has only recently been constructed).
- 5.6 On the basis of the above, I do not agree with Mr Gregory that there is no ability to increase traffic without increasing crash risk (his paragraph 67.4). Rather, in this case, the increase in traffic is small, and the effects on queues and delays slight, such that I consider there will be no material effect on road safety.

- 5.7 Mr Gregory rightly notes that the Woodend Bypass will have a transformative effect on Main North Road. I note that he considers that two thirds of the traffic will be removed by the bypass compared to the 80% cited in NZTA's earlier documentation, but the difference is not of relevance in my view as the outcome remains a substantial reduction. I agree that this will result in a large improvement in delays at intersections.
- 5.8 One final point raised by Mr Gregory (his paragraph 99) is that he seeks a rule that requires the upgrading of the existing road serving the site of submitter 299 so that it meets current standards. Given that he raises this matter in the context of other submissions, I consider that for consistency he will similarly seek a rule requiring the upgrading of Parsonage Road to current standards should the submission be accepted and the site rezoned.
- 5.9 In my view it is sufficient at this stage to show that there are no impediments to an improvement scheme, and for the details of such a scheme to be addressed when subdivision consents are sought in future. I do not consider that there are any such impediments, as the existing legal widths of the roads in the vicinity of the site are ample for any improvement schemes.
- 5.10 I have also reviewed the comments of Mr Buckley in his responses to the Panel's questions, and note that in his answer relating to paragraphs 301, 308-309, he describes that "*upgrades to the road network are standard matters addressed by subdivision*". I agree.

6. CONCLUSIONS

- 6.1 Based on my review of the transportation effects of the submission, I confirm my findings of my technical report, that:
- a. the traffic generated by the development of the site can be accommodated on the adjacent roading network without capacity or efficiency issues arising.
 - b. I acknowledge that the Main North Road / Parsonage Road and Main North Road / McQuillan Avenue intersections presently operate with a poor level of service at peak times for right-turning vehicles. However the small scale of development at the site

means that even when fully developed, changes in queues and delays at those intersections are extremely small and in my view unlikely to be perceptible to drivers.

- c. the crash history in the vicinity of the site does not indicate that there would be any adverse safety effects from the proposal.
- d. the site is within a viable walking / cycling distance of amenities within Woodend, including the Local Centre Zone located on the western side of Main North Road, just south of Parsonage Road, and Woodend School.
- e. although the proposal is for a rezoning, my review shows that any development is likely to have a high degree of compliance with the transportation requirements of the operative and proposed District Plans, with no unavoidable non-compliances.

6.2 Although the transportation aspects of the site are not specifically addressed in the Council Officers' reports, I have considered the principles of the comments made by Mr Gregory relating to another site that I consider to be comparable to that at Parsonage Road. On my review, I remain of the view that the small-scale nature of the development that would be facilitated by the rezoning will not have any material effect on the safety or efficiency of the transportation networks.

6.3 Overall, I consider that the requested rezoning can be supported from a traffic and transportation perspective.

ANDY CARR

5 July 2024

ANNEXURE A: TRANSPORTATION ASSESSMENT

Rainer and Ursula Hack

**Request for Rezoning
110 Parsonage Road, Woodend**

Transportation Assessment



**CARRIAGEWAY
CONSULTING**

traffic engineering | transport planning



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1. Introduction

- 1.1. Waimakariri District Council is presently reviewing its District Plan, as part of which it is also considering the rezoning of land. Land at 110 Parsonage Road (**the site**) is proposed by the Council to be zoned as Rural Lifestyle Zone. Rainer and Ursula Hack have sought that the site is instead zoned as a more intensive residential use, such as Large Lot Residential Zone (**LLRZ**), General Residential Zone (**GRZ**), Medium Density Residential Zone (**MDRZ**) or a combination of these zones. The submission also seeks the consideration of the rezoning of 90 Parsonage Road and part of 20 Thirlwall Street for LLRZ, GRZ, MDRZ or a combination.
- 1.2. This Transportation Assessment sets out a detailed analysis of the transportation issues associated with the requested zoning of the site, including changes in travel patterns that are likely to arise. Where potential adverse effects are identified, ways in which these can be addressed are set out.
- 1.3. This report is cognisant of the guidance specified in the New Zealand Transport Agency's '*Integrated Transport Assessment Guidelines*' and although travel by private motor vehicle is addressed within this report, in accordance with best practice the importance of other transport modes is also recognised. Consequently, travel by walking, cycling and public transport is also considered.



2. Site Overview

2.1. Location

2.1.1. The site is located towards the east of Woodend, at the eastern end of Parsonage Road. The location of the site in the context of the local area is shown in Figure 1 and in more detail in Figure 2.

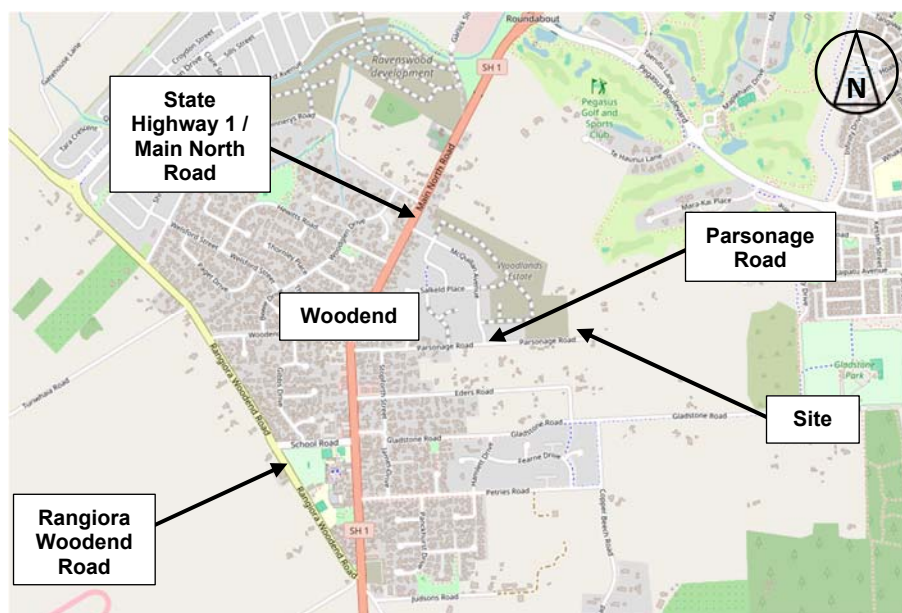


Figure 1: General Location of Site

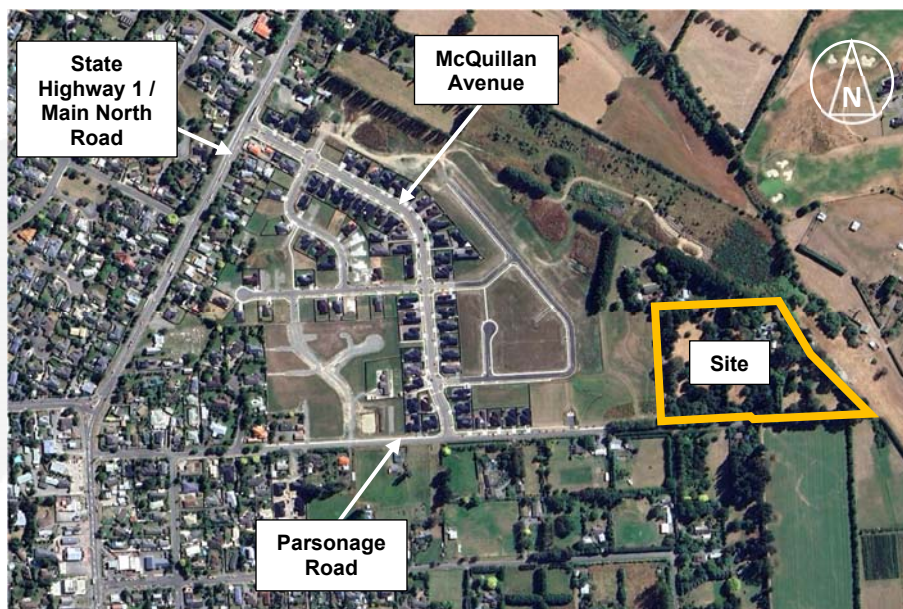


Figure 2: Aerial Photograph of Site and Environs

2.2. Roading Classification

2.2.1. The District Plan classifies State Highway 1 / Main North Road as a Strategic Road, the highest in the hierarchy and reflecting its status as a state highway. Parsonage Road and McQuillan Avenue are Local Roads, meaning that they provide for local journeys and property access.



3. Current Transportation Networks

3.1. *Roading Network*

3.1.1. All roads in the vicinity of the site have a 50km/h speed limit.

3.1.2. The formal formation of Parsonage Road terminates at the southwestern corner of 110 Parsonage Road. At this point the road has a seal width of 5.7m and a flat and straight alignment. There is a deep drainage swale on the southern side.



Photograph 1: Eastern End of Parsonage Road Looking East

3.1.3. West of this, the northern road frontage is characterised by a newly-constructed residential subdivision, with several private driveways joining Parsonage Road. Immediately west of this, McQuillan Avenue joins Parsonage Road at a priority 'give-way' tee-intersection. The flat and straight alignment of Parsonage Road means that sightlines at the intersection are excellent.



Photograph 2: Parsonage Road Looking East, New Houses on Left



Photograph 3: Parsonage Road / McQuillan Avenue Intersection

- 3.1.4. Approximately 250m west of McQuillan Avenue, the alignment of Parsonage Road has a left-right curve and west of this, the carriageway width increases to 8m. As with most of the road, parking is permitted on either side.



Photograph 4: Left-Right Curves in Parsonage Road Looking East

- 3.1.5. Approximately 140m west of these curves, Stopforth Street joins Parsonage Road from the south. Although Parsonage Road continues westwards, the priority of the road changes such that Stopforth Road and Parsonage Road (west) have priority, with traffic on Parsonage Road (west) having to give-way.



Photograph 5: Parsonage Road / Stopforth Road Intersection Looking East

- 3.1.6. Parsonage Road continues west for a further 120m, with this section of the road having a seal width of 9m and parking permitted on either side. The road then meets Main North Road (State Highway 1) at a priority ('stop') controlled intersection. This intersection does not have any auxiliary turning lanes, although there is a flush median on Main North Road that can be used by vehicles turning right into Parsonage Road.



Photograph 6: Main North Road / Parsonage Road Intersection Looking East

- 3.1.7. Just to the north of this intersection, Main North Road curves towards the northeast which limits the sightline available in this direction. However the distance is in the order of 90m which



is appropriate for an operating speed of 50km/h with very alert drivers¹. That said, if assessed under 'normal' alertness, there is a slight sight distance shortfall.

- 3.1.8. McQuillan Avenue has an 11m wide carriageway, with parking permitted on both sides. It serves a newly-constructed residential subdivision, with multiple driveways connecting to it from both sides. It has a flat alignment but curves towards the northwest to meet Main North Road at a priority ('stop') intersection located 0.5km north of the Main North Road / Parsonage Road intersection.



Photograph 7: Typical Cross-Section of McQuillan Avenue

- 3.1.9. The Main North Road / McQuillan Avenue intersection is constructed with an auxiliary lane for vehicles turning right off the highway.



Photograph 8: Main North Road / McQuillan Avenue Intersection Looking Northwest

¹ 1.5 second reaction time as per Austroads Guide to Road Design Part 4A ('Unsignalised and Signalised Intersections') Table 3.2



3.1.10. Main North Road forms part of State Highway 1, running through the centre of Woodend. To the south it provides a connection to Christchurch and other destinations further afield, and to the north it runs through Kaikoura to terminate in Picton.

3.2. Non-Car Infrastructure

3.2.1. As the roads leading to the site are constructed to an urban standard there are footpaths provided along their length, with one footpath on Parsonage Road and two footpaths on McQuillan Avenue (as can be seen on the photographs above). These are all 1.5m wide.

3.2.2. The flush median on Main North Road can be used by pedestrians crossing the highway, but there is also a formal pedestrian refuge located 140m south of the intersection with Parsonage Road.

3.2.3. There is a cycle lane that runs along each side of Main North Road, between the movement lane and the parking lane. However the southbound lane only commences to the immediate south of Parsonage Road. There is no formal provision for cyclists on Parsonage Road or McQuillan Avenue.

3.2.4. Neither Parsonage Road nor McQuillan Avenue are used by scheduled public transport, but Main North Road is a bus route and there is a southbound stop located 40m south of Parsonage Road. This is equipped with a shelter for passengers. The corresponding northbound stop is located 170m north of Parsonage Road, and has just a flag attached to a powerpole (as would be expected for the non-waiting direction of travel).

3.3. Future Changes

3.3.1. There are no known changes to the roading environment in the immediate area that are set out in any overarching strategies or guides.

3.3.2. At the time of writing, the Woodend Bypass has been recently designated as a Road of National Significance in the June 2024 Government Policy Statement on Land Transport. While details of funding and timing are not included within this, such roads are “*priorities for the government*” and are expected to be delivered “*as quickly as possible*” with an expectation that their funding will be “*prioritised*” by NZTA.

3.3.3. Data previously presented in respect of the Woodend Bypass indicates that up to 80% of the traffic on Main North Road could be removed by the scheme². Although this figure is nearly 10 years old and may now be different, it shows that the effect on the bypass on through traffic is likely to be substantial.

² <https://www.nzta.govt.nz/media-releases/woodend-corridor-designation-to-be-notified/>



4. Current Transportation Patterns

4.1. Traffic Flows

- 4.1.1. NZTA has a number of traffic counting locations around the country. The closest location to the site is on Main North Road just north of Petries Road and some 500m south of Parsonage Road (counter 01S00316). In 2022, this recorded an Annual Average Daily Traffic volume of 18,632 vehicles (two-way).
- 4.1.2. According to the MobileRoad website³, Parsonage Road carried 300 vehicles per day (two-way) with McQuillan Avenue carrying 50 vehicles per day.
- 4.1.3. As noted above however, the immediate area is characterised by a new residential development and therefore traffic flows in the area is likely to have changed. Accordingly, intersection turning surveys were carried out during June 2024 to survey the actual traffic flows at the Main North Road / Parsonage Road and Main North Road / McQuillan Avenue intersections.
- 4.1.4. As would be expected, the results were dominated by the 'straight ahead' movement of traffic on the highway (north to south and vice versa) which accounted for more than 97% of all traffic movements. This creates an unusual situation in that it then means the maximum amount of traffic passing through the intersections is determined by the number of vehicles on the highway, and this time does not correspond to the time of maximum traffic generation of the residential development served by Parsonage Road and McQuillan Avenue:
- Main North Road / Parsonage Road intersection
 - 7:00am to 8:00am for the morning peak hour of highway, compared to 7:30am to 8:30am for the residential;
 - 4:30pm to 5:30pm for the evening peak hour of highway, compared to 3:30pm to 4:30pm for the residential
 - Main North Road / McQuillan Avenue intersection
 - 7:00am to 8:00am for the morning peak hour of highway, compared to 7:30am to 8:30am for the residential;
 - 4:00pm to 5:00pm for the evening peak hour of highway, compared to 4:30pm to 5:30pm for the residential
- 4.1.5. It is likely that any residential development will have the same traffic generation characteristics as the existing development and consequently will generate traffic at similar times. Accordingly for the purposes of this assessment, two assessments have been made.
- 4.1.6. The peak hour determined by the maximum amount of traffic seen at the intersections is shown below:

³ www.mobileroad.org

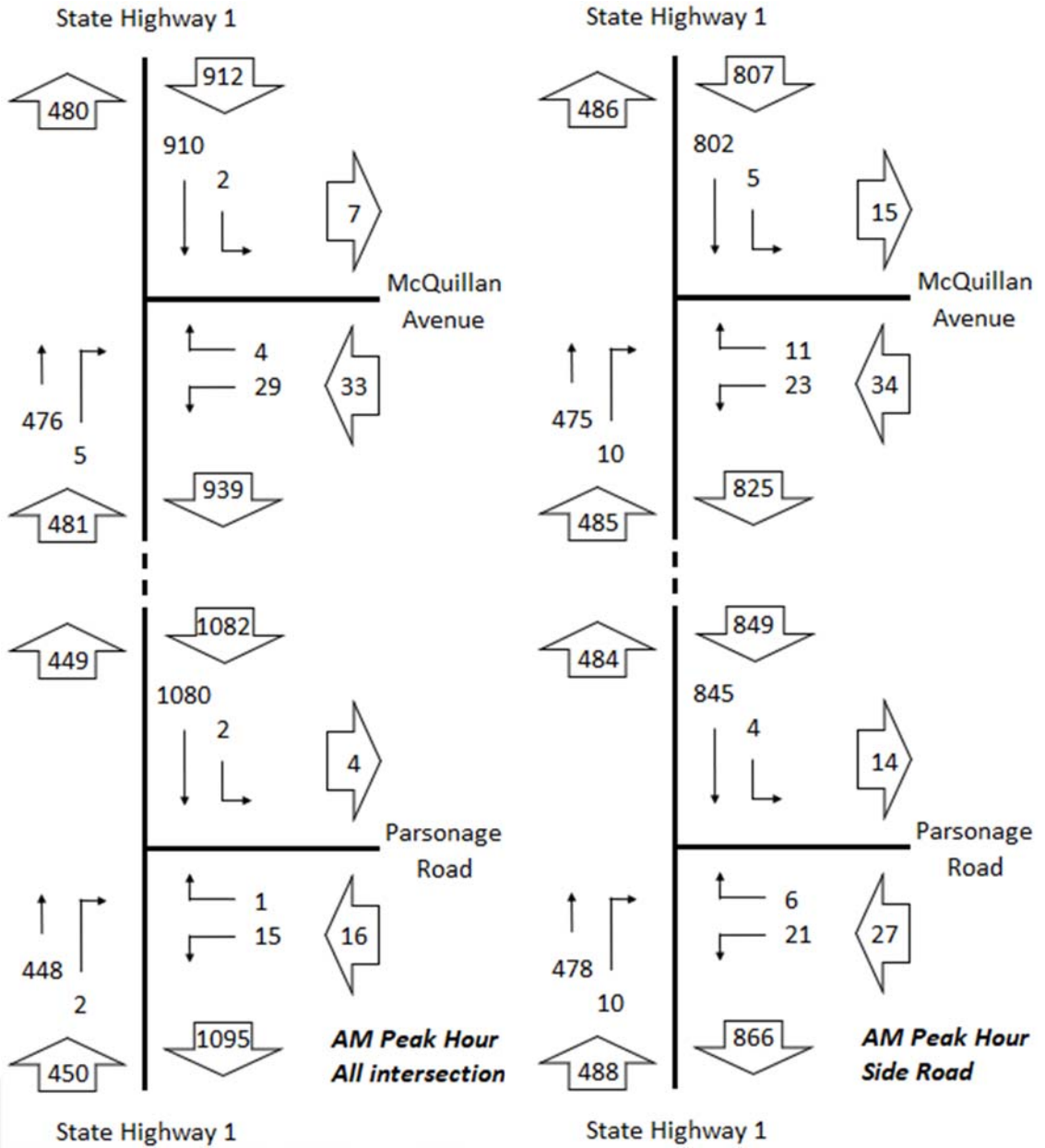


Figure 3: Existing Morning Peak Hour, Maximum Traffic at Intersection (Left) and on Side Roads (Right)

4.1.7. The peak hour determined by the maximum amount of traffic seen on the side roads is shown below:

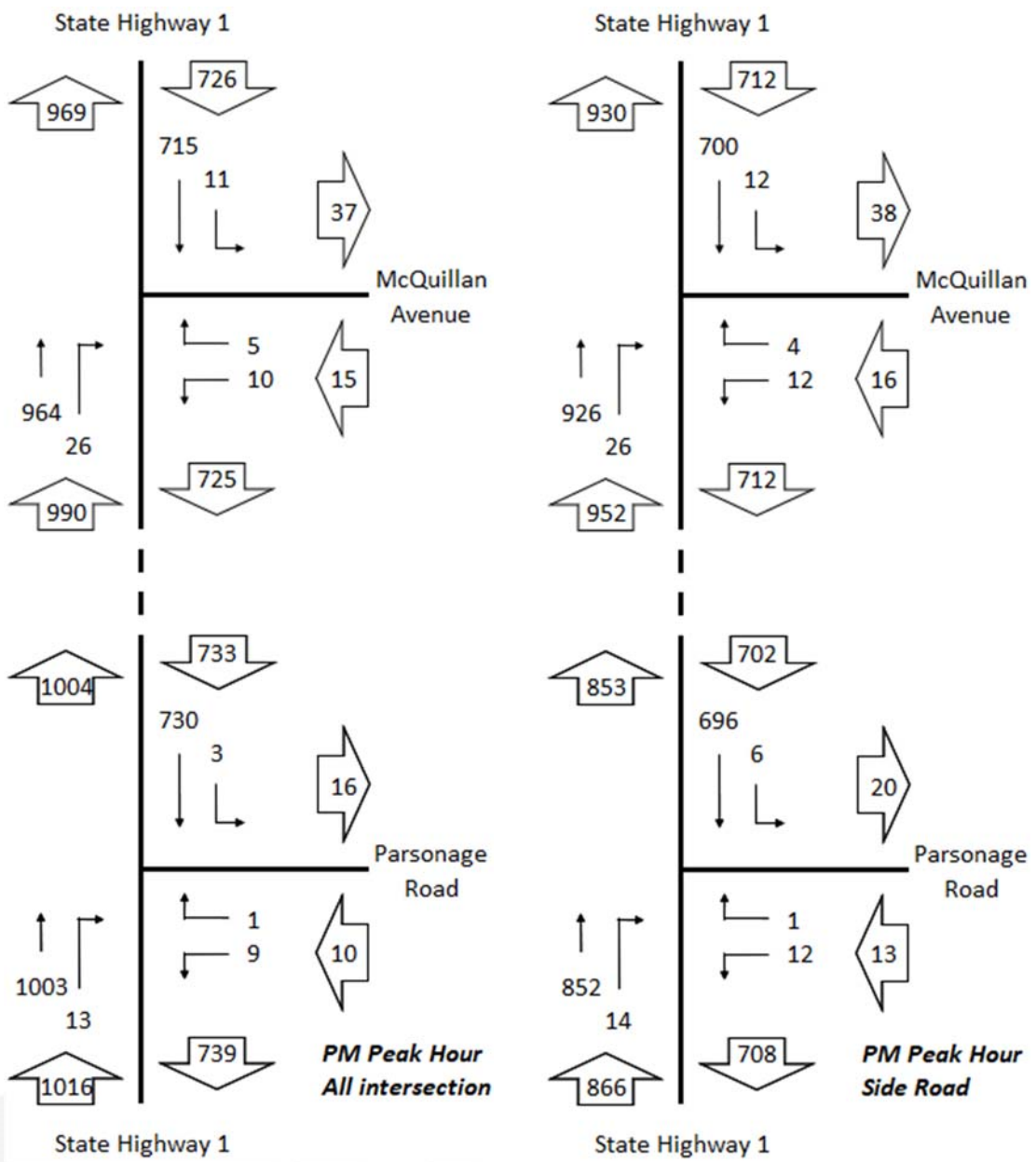


Figure 4: Existing Evening Peak Hour, Maximum Traffic at Intersection (Left) and on Side Roads (Right)

4.1.8. The performance of the intersections has been modelled using the computer software package Sidra Intersection and the results are summarised below.

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1	R	17.4	0.0	C	9.8	0.1	A
Parsonage Road	L	26.8	0.3	D	13.8	0.1	B
	R	61.3	0.0	F	87.3	0.1	F
State Highway 1	L	5.8	0.0	A	5.7	0.0	A

Table 1: Current Peak Hour Levels of Service at the Main North Road / Parsonage Road Intersection, Highest Overall Traffic Flows



Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1 (south)	R	11.5	0.1	B	9.4	0.1	A
Parsonage Road	L	16.6	0.2	C	13.3	0.1	B
	R	35.8	0.1	E	51.5	0.0	F
State Highway 1 (north)	L	5.7	0.0	A	5.6	0.0	A

Table 2: Current Peak Hour Levels of Service at the Main North Road / Parsonage Road Intersection, Highest Traffic Flows on Minor Approach

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1 (south)	R	12.5	0.0	B	9.8	0.1	A
McQuillan Avenue	L	18.7	0.4	C	13.6	0.4	B
	R	42.8	0.4	E	79.8	0.4	F
State Highway 1 (north)	L	5.7	0.0	A	5.7	0.0	A

Table 3: Current Peak Hour Levels of Service at the Main North Road / McQuillan Avenue Intersection, Highest Overall Traffic Flows

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1 (south)	R	10.7	0.1	B	9.6	0.1	A
McQuillan Avenue	L	15.8	0.4	C	13.4	0.3	B
	R	33.3	0.4	D	68.8	0.3	F
State Highway 1 (north)	L	5.7	0.0	A	5.7	0.0	A

Table 4: Current Peak Hour Levels of Service at the Main North Road / McQuillan Avenue Intersection, Highest Traffic Flows on Minor Approach

- 4.1.9. At any priority intersection, the greatest delays arise for the right-turn movement from the minor approach. In this case it can be seen that for the right-turn from Parsonage Road in both peak hours, and from McQuillan Drive in the evening peak hour, delays of more than a minute are modelled which then results in Level of Service F, the lowest within the range of A to F.
- 4.1.10. This outcome is not unexpected, and delays of this nature arise on all of the priority intersections within Woodend at the current time. The traffic data described in paragraph 4.1.4 above is likely to be indicative of residents choosing to travel at times where there is less congestion on the road network in order to avoid delays. One further outcome that arises with current conditions is that drivers ‘wave through’ other vehicles exiting side roads, and this was observed during the traffic counts.



4.1.11. The NZTA traffic counter shows that traffic volumes on Main North Road have increased by around 1.4% per annum over the past few years (disregarding short-term decreases due to Covid-19 travel restrictions), expressed as a percentage of the 2022 volumes.

4.2. Non-Car Modes of Travel

4.2.1. Given that the area is predominantly urban, it can reasonably be expected that it will be relatively well used by pedestrians and cyclists. The current provision of footpaths is considered to be appropriate given the limited amount of development in the immediate area.

4.2.2. The low traffic volumes on Parsonage Road and McQuillan Avenue means that cyclists are able to safely share the road with motorised traffic. Accordingly it is considered that the lack of infrastructure is not unreasonable.

4.2.3. The bus service using Main North Road (service 95) operates with a 20-minute frequency in the weekday peak hours, and a one-hour frequency outside these times. The route connects Waikuku and Pegasus to the north, with the Bus Interchange in Christchurch Central City.

4.3. Road Safety

4.3.1. The NZTA Crash Analysis System (**CAS**) has been used to establish the location and nature of the recorded traffic crashes in the vicinity of the site. All reported crashes between 2017 and 2023 were identified, plus the partial record for 2024⁴, were identified for all of Parsonage Road and McQuillan Avenue⁵, plus their intersections with the highway for a distance of 50m (in order to identify crashes associated with turning movements at the intersections).

4.3.2. This showed that four crashes had been reported:

- One crash occurred just north of McQuillan Avenue, when an intoxicated driver on the highway ran into the rear of a truck that was parked by the side of the road. The crash did not result in any injuries;
- One crash occurred just south of McQuillan Avenue, when a north-facing driver pulled out into the traffic and collided with a northbound vehicle on the highway. The crash did not result in any injuries;
- One crash occurred around 40m south of Parsonage Road, when a southbound driver fell asleep and ran into the rear of parked vehicles. The crash did not result in any injuries;
- One crash occurred around 45m south of Parsonage Road, when a driver turned right out of the driveway to the café on the western side of the road and failed to give-way to a northbound vehicle which ran into them. The crash resulted in serious injuries.

4.3.3. It is not considered that the historic pattern of crashes indicates any inherent road safety deficiency in the immediate area. The crashes all occurred within different contributing factors, in different locations or with different vehicle movements involved. Of note is that no crashes involved vehicles turning to or from either Parsonage Road or McQuillan Avenue, and no crashes were recorded on either Parsonage Road or McQuillan Avenue, themselves.

⁴ Usually a five-year period is considered, but due to travel restrictions due to the pandemic, a further two years have been considered

⁵ Noting that McQuillan Avenue has recently been constructed and would not have been in place during the earlier years in this range.

5. Proposal

- 5.1. The proposal is for the rezoning of the land from Rural Lifestyle Zone to a more intensive residential use, such as Large Lot Residential Zone, General Residential Zone, Medium Density Residential Zone or a combination of these zones.
- 5.2. Since the request is for a rezoning, there is no specific subdivision or development proposal. However the Statement of Evidence of Ms Edmonds sets out an indicative layout, replicated below.



Figure 5: Indicative / Concept Masterplan for the Site (Extract from Align Drawing)

- 5.3. It can be seen that access is indicated onto Parsonage Road, and in practice this is the only practical manner of gaining access onto the external roading network.
- 5.4. A total of 31 lots are shown on the masterplan but recognising that the development pattern is not confirmed, within this assessment an allowance has been made for 35 residences.



6. Traffic Generation and Distribution

6.1. Traffic Generation

- 6.1.1. Traffic generated by residential developments is known to vary for a variety of reasons. NZTA Research Report 453 ('Trips and Parking Related to Land Use) sets out that for residential outer-suburban dwellings, a rate of 0.9 vehicle movements (two-way) can be expected in the peak hour (of the development), and this rate has been applied in this instance.
- 6.1.2. Thus for a development of 35 lots, the site will generate peak hour traffic volumes of 32 vehicle movements (two-way).
- 6.1.3. It is anticipated that the residents of the site (assuming it was to be rezoned) will have the same travel patterns as residents that are already within the immediate area. Accordingly the direction of the generated traffic (into or out of the site) has been assigned as per the observations made during the traffic surveys described previously.
- 6.1.4. This traffic volume reflects the peak hour of the potential residential development but as set out above, this occurs at a different time to the peak hour on the roading network. That is, there are two critical periods – the hours when the existing residential development generates maximum traffic volumes (which are not the hours when the highest flows were seen on the highway) and the hours when the highest flows were seen on the highway (which is not the hours when the existing residential development generates maximum traffic volumes).
- 6.1.5. To take both of these into account, two scenarios have been considered. This first scenario is that the peak hour traffic generation of the rezoned site has been added into the peak hour of the existing residential development served by the side roads. This scenario therefore does not allow for the peak traffic flows seen on the highway.
- 6.1.6. The second scenario uses the peak hours seen on the highway, but as set out above, at this time the existing residential development does not generate its peak volumes. Accordingly, the expected peak hour traffic from the rezoned site has been factored down to reflect this. By way of example:
- Figure 3 shows 21 vehicles turning left out of Parsonage Road in the morning peak hour for the peak traffic generation of the existing residential development.
 - Figure 3 also shows 15 vehicles turning left out of Parsonage Road in the morning peak hour for the peak traffic generation of the state highway.
 - In other words, for the peak hour of the highway, there is a 29% reduction in this turning movement compared to the peak hour of the residential development.
 - Hence in order to devise a scenario that reflects the likely traffic generation of the rezoned site, the peak volume of the rezoned site has been reduced by 29% on this turning movement.

6.2. Trip Distribution

- 6.2.1. With regard to the distribution of these vehicles, it is anticipated that the residents of the site (assuming it was to be rezoned) will have the same destinations as residents that are already within the immediate area. Accordingly the generated traffic has been assigned as per the observations made during the traffic surveys described previously in this report.



6.2.2. The exceptions to this are that drivers are assumed to take the shortest route and so:

- Generated traffic turning right into the site has been assigned to turn into Parsonage Road rather than McQuillan Avenue;
- Generated traffic turning left out of the site has been assigned to turn out of Parsonage Road rather than McQuillan Avenue

6.2.3. This yields the following new traffic on the network:

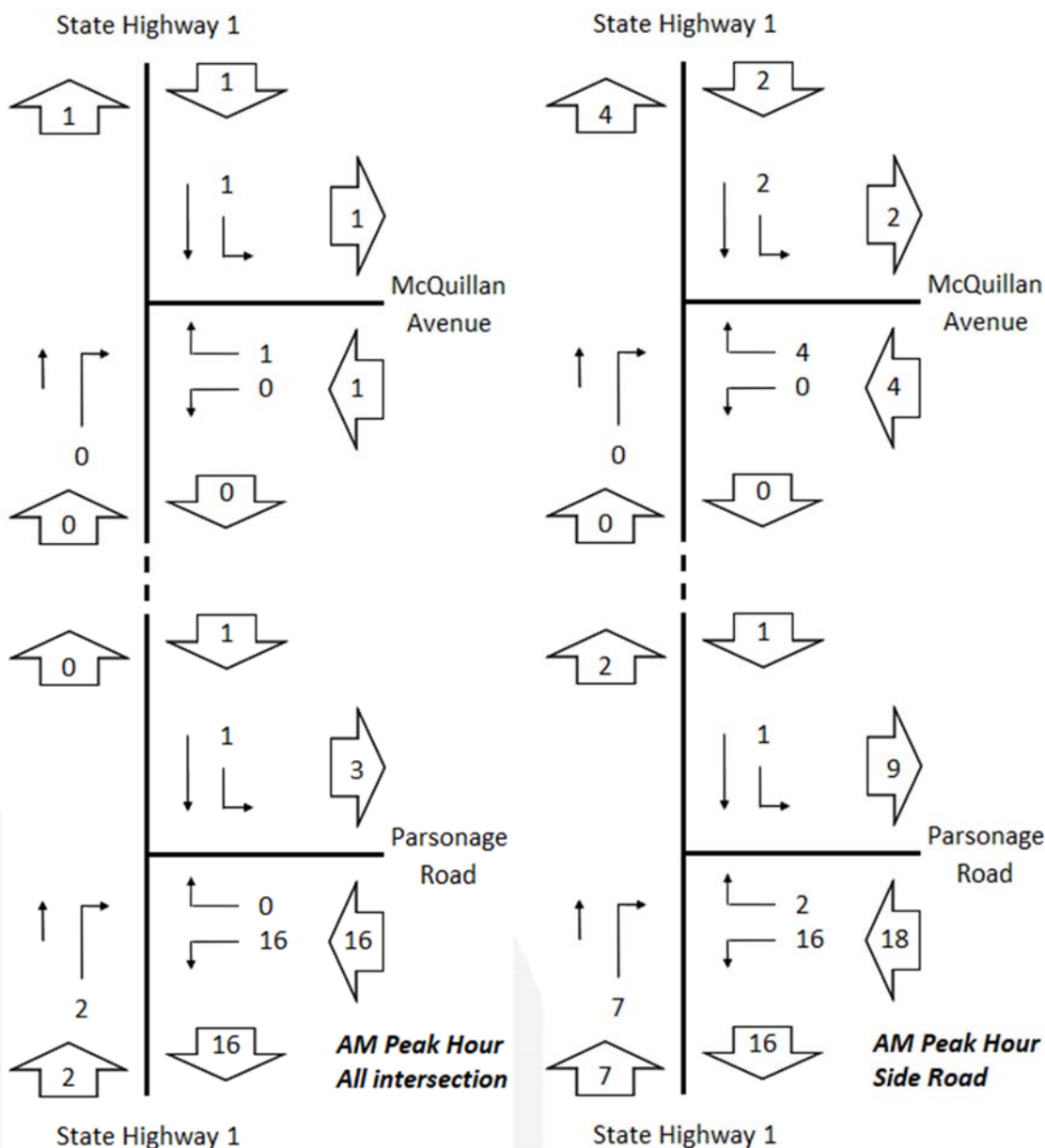


Figure 6: Morning Peak Hour at Full Site Development, Maximum Traffic at Intersection (Left) and on Side Roads (Right)

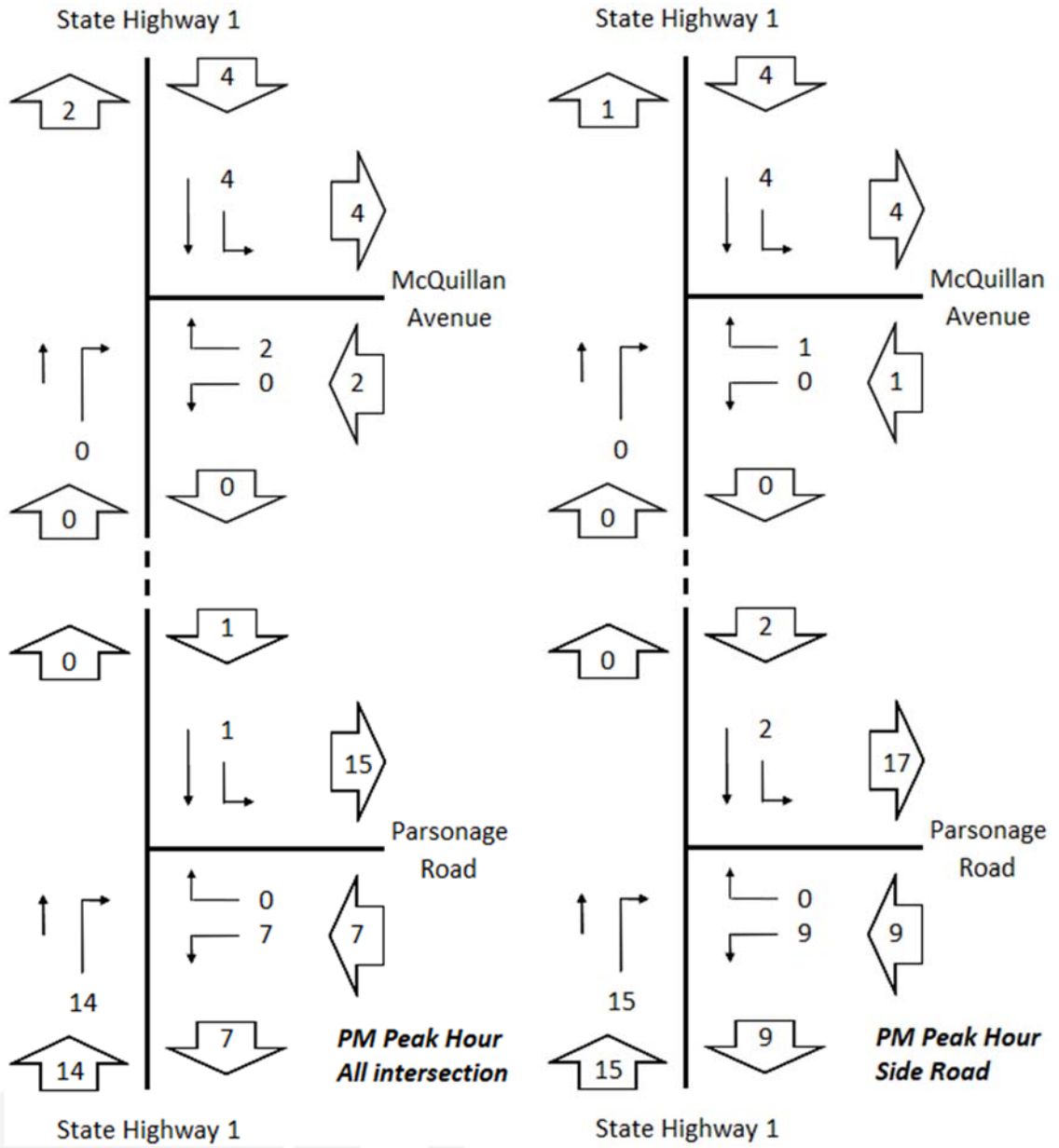


Figure 7: Evening Peak Hour of Full Site Development, Maximum Traffic at Intersection (Left) and on Side Roads (Right)



7. Effects on the Transportation Networks

7.1. Rooding Capacity

7.1.1. The traffic generated by the full development of the site, if rezoned, has been added to the rooding network and the intersections remodelled using Sidra Intersection. The results are summarised below.

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1 (south)	R	17.5	0.0	C	9.9	0.2	A
Parsonage Road	L	27.9	0.5	D	13.9	0.1	B
	R	61.4	0.0	F	88.8	0.1	F
State Highway 1 (north)	L	5.8	0.0	A	5.7	0.0	A

Table 5: Peak Hour Levels of Service at the Main North Road / Parsonage Road Intersection, Highest Overall Traffic Flows, with Traffic from Rezoned Site

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1 (south)	R	11.6	0.1	B	9.5	0.2	A
Parsonage Road	L	16.8	0.3	C	13.4	0.1	B
	R	36.3	0.2	E	52.5	0.0	F
State Highway 1 (north)	L	5.7	0.0	A	5.6	0.0	A

Table 6: Peak Hour Levels of Service at the Main North Road / Parsonage Road Intersection, Highest Traffic Flows on Minor Approach, with Traffic from Rezoned Site

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1 (south)	R	12.5	0.0	B	9.8	0.2	A
McQuillan Avenue	L	18.7	0.5	C	14.6	0.5	B
	R	42.9	0.5	E	81.4	0.5	F
State Highway 1 (north)	L	5.7	0.0	A	5.7	0.0	A

Table 7: Peak Hour Levels of Service at the Main North Road / McQuillan Avenue Intersection, Highest Overall Traffic Flows, with Traffic from Rezoned Site



Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1 (south)	R	10.7	0.1	B	9.6	0.1	A
McQuillan Avenue	L	15.8	0.5	C	13.4	0.3	B
	R	33.7	0.4	D	69.2	0.3	F
State Highway 1 (north)	L	5.7	0.0	A	5.7	0.0	A

Table 8: Peak Hour Levels of Service at the Main North Road / McQuillan Avenue Intersection, Highest Traffic Flows on Minor Approach, with Traffic from Rezoned Site

7.1.2. To assist in comparing the effects of this additional traffic, the differences with and without the traffic from the development of the rezoned site are set out below.

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1 (south)	R	+0.1	-	-	+0.1	+0.1	-
Parsonage Road	L	+1.1	+0.2	-	+0.1	-	-
	R	+0.1	-	-	+1.5	-	-
State Highway 1 (north)	L	-	-	-	-	-	-

Table 9: Comparison of Peak Hour Levels of Service at the Main North Road / Parsonage Road Intersection, Highest Overall Traffic Flows, With/Without Traffic from Rezoned Site

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1 (south)	R	+0.1	-	-	+0.1	+0.1	-
Parsonage Road	L	+0.2	+0.1	-	+0.1	-	-
	R	+0.5	+0.1	-	+1.0	-	-
State Highway 1 (north)	L	-	-	-	-	-	-

Table 10: Comparison of Peak Hour Levels of Service at the Main North Road / Parsonage Road Intersection, Highest Traffic Flows on Minor Approach, With/Without Traffic from Rezoned Site



Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1 (south)	R	-	-	-	-	+0.1	-
McQuillan Avenue	L	-	+0.1	-	+1.0	+0.1	-
	R	+0.1	+0.1	-	+1.6	+0.1	-
State Highway 1 (north)	L	-	-	-	-	-	-

Table 11: Comparison of Peak Hour Levels of Service at the Main North Road / McQuillan Avenue Intersection, Highest Overall Traffic Flows, With/Without Traffic from Rezoned Site

Road and Movement		Morning Peak Hour			Evening Peak Hour		
		Avg Delay (secs)	95 %ile Queue (veh)	Level of Service	Avg Delay (secs)	95 %ile Queue (veh)	Level of Service
State Highway 1 (south)	R	-	-	-	-	-	-
McQuillan Avenue	L	-	+0.1	-	-	-	-
	R	+0.4	-	-	+0.4	-	-
State Highway 1 (north)	L	-	-	-	-	-	-

Table 12: Comparison of Peak Hour Levels of Service at the Main North Road / McQuillan Avenue Intersection, Highest Traffic Flows on Minor Approach, With/Without Traffic from Rezoned Site

- 7.1.3. Tables 9 to 12 above show that the effects of the additional traffic at the intersections onto Main North Road are minimal. Even in the worst case, the queue increases by just 0.2 vehicle lengths with an increase in delay of 1.6 seconds (although for 12 of the 17 cases where delays increase, this increase is half a second or less). It is unlikely that these differences will be perceptible to drivers.
- 7.1.4. This outcome is not unexpected, as the increase in traffic flows through the two intersections due to development of the site represents an average increase of just 0.6% over current volumes.
- 7.1.5. Where land is to be rezoned, it is common to assess a notional 'design year' of ten years into the future. In this case however, within this timeframe it is likely that the Woodend Bypass will be constructed and as noted above, this is expected to have a substantial effect on reducing the traffic volume on Main North Road. Moreover, up to that point traffic on Main North Road can be expected to continue increasing in line with the historic rate of just 1.4% per annum.
- 7.1.6. Consequently given the low traffic growth rate, the very small percentage increase due to traffic generated by the proposed rezoning, and the expected large reduction in traffic on Main North Road in the foreseeable future, it can be concluded that the rezoning of the site will have only a very small effect on queues and delays at the Parsonage Road and McQuillan Avenue intersections onto Main North Road.
- 7.1.7. With regard to the formation of the roads, the legal widths of Parsonage Road and McQuillan Avenue are both sufficient to accommodate any necessary improvement measures arising from the increase in traffic. However the details of this are a matter for consideration at the time that subdivision consents are lodged, and it is noted that the increase equates to an average of one additional vehicle movement every 2 minutes at the busiest of times. In



practice, such increases are easily able to be accommodated within the current formation of the road.

7.2. Non-Car Modes of Travel

- 7.2.1. The development of the site may result in increased levels of walking and cycling in the immediate area. However, these will only be small because of the scale of development.
- 7.2.2. It is typically accepted that people will walk a maximum of 1km to reach a particular destination, and will cycle a maximum distance of 3km⁶. In this regard, the site lies within a viable non-car travel distance of many of the amenities in Woodend, including the Local Centre Zone located on the western side of Main North Road, just south of Parsonage Road, and Woodend School.
- 7.2.3. Accordingly, it is considered that the site is well-located for accessibility to key destinations without the need to use a private car.
- 7.2.4. Footpaths are already in place on the roads around the site, but the legal widths of the roads are sufficient that a second footpath could be provided without the need for third party land. However the low traffic flows (even with full development of the site) do not indicate that any specific infrastructure is justified for cyclists.
- 7.2.5. In both cases however, the matter of whether additional walking and cycling infrastructure is required can be considered when consents are sought to subdivide the site.
- 7.2.6. The size of the site is not sufficient that it will give rise to the need for a public transport service. If a service was to be developed in future, it is unlikely it would operate through the site due to the low number of passengers and so the existing route via Main North Road is more likely.

7.3. Road Safety

- 7.3.1. Based on a review of the road safety records, the proposal is unlikely to result in adverse road safety effects arising as a result of the slight increase in traffic flows on the road network. There is no evidence of any existing road safety issues on Parsonage Road, McQuillan Avenue or their intersections with the highway. The proposal represents an increase of less than 1.5% over and above current peak hour volumes on Main North Road, meaning that it is very unlikely that there will be any effect on the safety of the highway.
- 7.3.2. One aspect of road safety relates to ensuring that the intersection onto Parsonage Road, and the current intersections on which traffic would be loaded, have the appropriate generalised layout. In this regard, the expected traffic volumes do not indicate that any changes would be needed to the existing intersections (although again, this is a matter that can be confirmed at the time subdivision consents are sought).
- 7.3.3. A basic priority intersection will easily have the capacity to accommodate the anticipated traffic flows at the site access. The alignment of Parsonage Road means that appropriate sight distances will be provided. Other matters relating to the intersection serving the site are discussed below.
- 7.3.4. The site is relatively flat and there are no reasons why the internal roading network could not meet appropriate design guides and standards.

⁶ Government strategy, 'Getting there – on foot, by cycle'



8. District Plan

- 8.1. The District Plan sets out a number of transportation-related rules with which any development is expected to comply. Although the proposal is for a rezoning, consideration of these rules is important at this stage at a high level in order to identify whether there are any likely non-compliances within the indicative subdivision plan or impediments to a complying subdivision layout in future.
- 8.2. As noted above, the legal widths of the existing roads are able to accommodate any improvements considered necessary at the time of subdivision.
- 8.3. Given the 'green field' nature of the site, and that the site is generally flat, it is considered that there are no constraints that would limit the ability to form an access roadway that meets the expectations of both the operative and proposed District Plans.
- 8.4. Consequently, the only material matter for consideration in this regard relates to the need to form an intersection onto Parsonage Road to serve the development. Under Conditions 30.6.1.32 to 30.6.1.33 of the operative District Plan, as the speed limit on Parsonage Road is 50km/h then there is a requirement for a separation of 125m. Rule TRAN-R4 and Standard TRAN-S2 under the proposed District Plan refine this to 75m where the intersections are between Local Roads. In this case, a separation of more than 125m is achievable.
- 8.5. Under TRAN-R20 (High Traffic Generators) any activity that generates more than 200 vehicle movements per day is a High Traffic Generator, for which a Transportation Assessment is required. This report responds to this issue, as the potential 35 residences would generate more than this threshold. However when subdivision consents are sought, the Council retains the ability to consider traffic matters at that time through a Transportation Assessment.
- 8.6. Overall, it is not considered that the rezoning of the site will result in any unavoidable non-compliances with the District Plan.



9. Conclusions

- 9.1. This report has identified, evaluated and assessed the various transport and access elements of a proposed rezoning of land at Parsonage Road, Woodend, able to accommodate up to 35 residences.
- 9.2. Overall it is considered that the traffic generated by the development of the site can be accommodated on the adjacent roading network without capacity or efficiency issues arising. It is acknowledged that the Main North Road / Parsonage Road and Main North Road / McQuillan Avenue intersections presently operate with a poor level of service at peak times. However the small scale of development at the site means that even when fully developed, changes in queues and delays at those intersections are extremely small and unlikely to be perceptible to drivers.
- 9.3. The crash history in the vicinity of the site does not indicate that there would be any adverse safety effects from the proposal.
- 9.4. The site is within a viable walking / cycling distance of amenities within Woodend, including the Local Centre Zone located on the western side of Main North Road, just south of Parsonage Road, and Woodend School.
- 9.5. Although the proposal is for a rezoning, a review shows that it is likely that there will be a high degree of compliance with the transportation requirements of the operative and proposed District Plans, with no unavoidable non-compliances.
- 9.6. Overall, and subject to the preceding comments, the rezoning can be supported from a traffic and transportation perspective and it is considered that there are no traffic and transportation reasons why the zoning is inappropriate in this location.

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