Planning · Traffic · Development

Transportation Assessment prepared for

Ballymena Holdings Limited

Proposed Plan Change: Springfield

June 2013

Transportation Assessment prepared for

Ballymena Holdings Limited

Proposed Plan Change: Springfield
June 2013

Novo Group Ltd
10 Bishop Street, St Albans
PO Box 38 123, Christchurch 8842
P: (03) 365 5570
E: info@novogroup.co.nz
W: www.novogroup.co.nz

Document Date:	25/06/2013
Document Version/Status:	Final
Project Reference:	038002
Project Manager:	Rhys Chesterman
Prepared by:	Rhys Chesterman
Reviewed by:	Lisa Williams

Table of Contents

INTRODUCTION 1
THE PROPOSAL 1
THE TRAFFIC ENVIRONMENT 1
Pocock Road 2
Annavale Road 2
Un-Named Road 3
State Highway 73 4
Reported Crash History 4
DISTRICT PLAN ASSESSMENT 4
ASSESSMENT OF EFFECTS 4
Car Parking, Vehicular Access and Circulation 5
Daily Traffic Generation 5
Peak Hour Traffic Generation 6
Traffic Distribution 6
Road Network Effects – Local Network 6
Road Network Effects – State Highway 73 Intersection 7
CONCLUSION 8

Table of Figures

Figure 1: Surrounding Road Environment and Application Site (Indicative) 1
Figure 2: Typical Cross-Section Pocock Road 2
Figure 3: Typical Cross-Section Annavale Road 3
Figure 4: Typical Cross-Section of Un-Named Road 3

List of Tables

Table 1: Proposed T-Junction Access onto SH73 from Pocock Road 8

INTRODUCTION

1. Novo Group Limited has been commissioned by Ballymena Holdings Limited to provide a Transportation Assessment in relation to a proposed plan change in Springfield. The Plan Change seeks to rezone this land for residential purposes.

2. This report provides an assessment of the transportation aspects of the proposed development. It also describes the traffic environment in the vicinity of the site, describes the traffic related components of the proposal and identifies compliance issues with the traffic provisions in the City Plan. It has been prepared broadly in accordance with the Integrated Transportation Assessment Guidelines specified in New Zealand Transport Agency Research report 422, November 2010.

THE PROPOSAL

3. The site is located in Springfield on the northern side of State Highway 73 (SH73). It is proposed to rezone the site from its current *rural (outer plains)* zoning to *Living 2*, which provides *inter alia* for dwellings in a low density environment with roads designed reflect the sense of open space and 'spaciousness' anticipated by persons wishing to live such a low density residential environment.

4. For the purposes of this assessment it is considered that approximately 14 residential lots could be created if the application site is eventually subdivided and constructed in accordance with the provisions of the Living 2 zoning. The following assessment is therefore based on assessing the traffic effects of 14 residential allotments around the indicative layout shown in the proposed Outline Development Plan (ODP) prepared by Planning Solutions Limited.

5. The ODP shows how the site is bounded by Annavale Road to the south and south-west, Pocock Road to the east and the Midland Railway Line to the north.

6. No new roads are proposed. Instead the existing roads that bound the site will be used for access purposes. It is likely that a private right-of-way will serve up to six lots – which will have direct access from Annavale Road.

THE TRAFFIC ENVIRONMENT

7. The surrounding area and roading formation is shown in Figure 1 below.

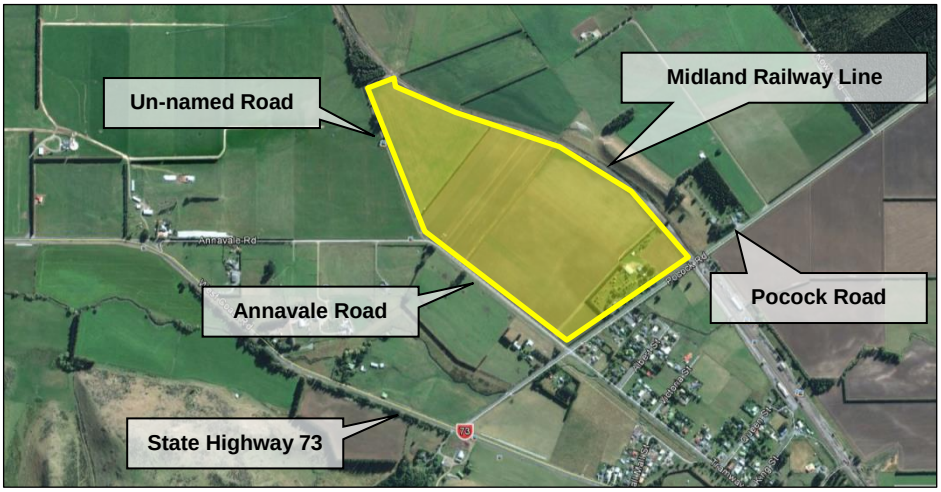

Figure 1: Surrounding Road Environment and Application Site (Indicative)

Pocock Road

8. Pocock Road is classified as a local road in the Selwyn District Plan, which means that it has a specific function of providing property access. It has a total length of approximately 2.2 kilometres, of which 400 metres directly front the application site.

9. The NZTA Crash Analysis System reveals that Pococks Road carries around 165 vehicles per day.

10. Pocock Road has a sealed carriageway width of 6.0 metres. Given its classification and the low traffic volumes, this does not have a painted centreline or edge-lines. Nor does it have a sealed shoulder. It does however have flat grass berms on each side.

11. As is expected in such environments, there are no footpaths or dedicated cycle lanes along the entire length of Pocock Road.

12. A typical road cross section of Pocock Road is shown below in Figure 2.

Figure 2: Typical Cross-Section Pocock Road
(Looking north-east through the Annavale Road intersection)

Annavale Road

13. Annavale Road is classified as a local road in the Selwyn District Plan, which means that it also has a specific function of providing property access. It has a total length of approximately 1.2 kilometres, of which 500 metres directly front the application site.

14. There are no traffic counts available for Annavale Road. Given that this serves only a small handful of residential houses/farms it can be confidently stated that it generates well under 100 vehicle movements per day.

15. Annavale Road is currently metalled with a width of around 4.2 metres. Council have indicated that this comprises of a 16 week grading cycle which is reflective of its low use.

16. As is expected in such environments, there are no footpaths or dedicated cycle lanes along the entire length of Annavale Road. The grass berms however provide for adequate pedestrian and equestrian use.

17. A typical road cross section of Annavale Road is shown below in Figure 3.

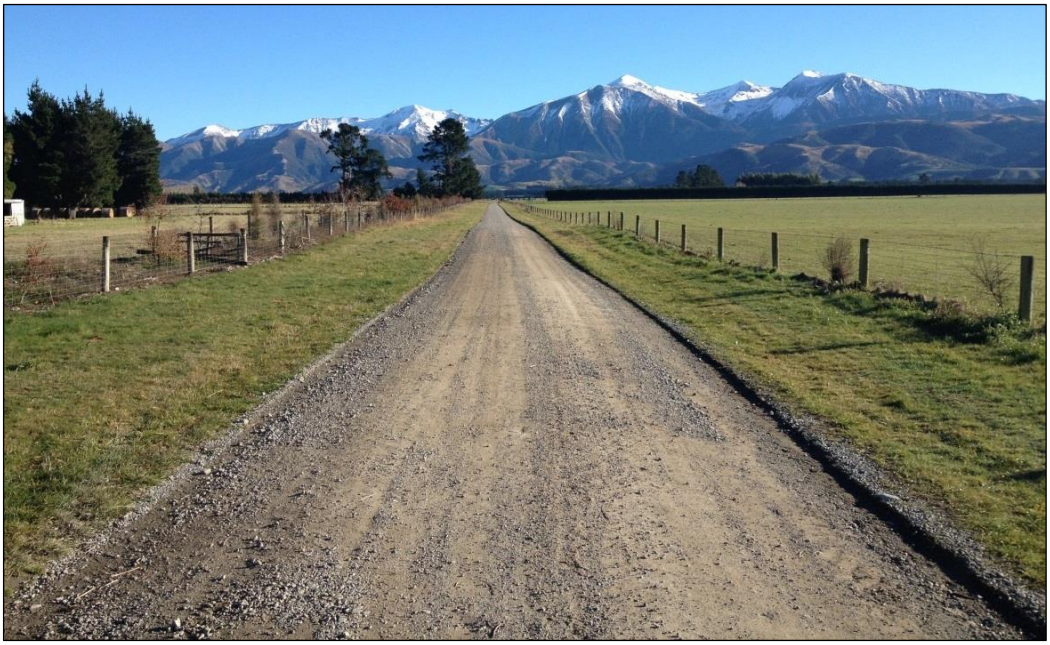

Figure 3: Typical Cross-Section Annavale Road
(Looking north-west from the Pocock Road intersection)

Un-Named Road

18. An un-named road runs along the western boundary of the site. This is best described as a partly metalled road more akin to a farm track. Traffic volumes along this road are confined farm/paddock access only. It has an existing trafficable width of around 3.0 metres.

19. A typical road cross section of the un-named road is shown below in Figure 4.

Figure 4: Typical Cross-Section of Un-Named Road
(Looking north-west from the Annavale Road intersection)

State Highway 73

20. State Highway 73 essentially runs in an east-west direction approximately 400 metres south of the application site. It is designed to carry high through volumes. The NZTA *State Highway Traffic Data Booklet 2007-2011* suggests that this road carries around 1,600 vehicles per day (last counted in 2011 at Telemetry Site 11, west of the Springfield Township). This includes 12.5% heavy vehicles.

21. Pocock Road forms a T-junction with SH73. Priority is afforded to traffic along the state highway. The intersection is controlled by a give-way sign.

Reported Crash History

22. A review of the NZTA Crash Analysis System (CAS) reveals that there have been no reported crashes along any of the application site frontage roads, including the Pocock Road/SH73 intersection in the five year period ending 25 June 2013. This is not unexpected given the low traffic volumes.

DISTRICT PLAN ASSESSMENT

23. The site is currently located in the ***Rural (Outer Plains)*** zone in the District Plan. It is sought to rezone the site for ***Living 2*** purposes.

24. It is noted that any residential development on any subsequent allotments could comply with all the relevant transport related requirements of the District Plan. This includes adequate parking, access and manoeuvring for each residential house on each new allotment. Failure to comply with any of these standards would result in the requirement for resource consent approval to be considered separately and subsequent to this Plan Change application.

25. The wider application site could also be made to comply with any relevant Engineering Code of Practice and any detailed design could be tailored to the satisfaction of the Council at the time of subdivision. This includes detailed design pertaining to road, berm and footpath widths, lighting, cross fall and kerb design – if and where relevant.

ASSESSMENT OF EFFECTS

26. An application for a zone change enables all potential effects to be considered. In terms of traffic related issues, these effects relate to issues such as the geometric layout of the site and the effects of site generated traffic on the capacity of the surrounding road network.

27. For the purposes of this report, any future subdivision within the application site will be assumed to comply with the District Plan and/or Councils Engineering Code of Practice.

28. Given that it is unlikely that any new roads would be created through the application site, there is no consideration required for aspects such as internal road widths, internal pedestrian provision and/or internal intersection design. Instead, the traffic related issues with this proposal relate to the ability of the existing road network in the vicinity of the site to safely cater for site generated traffic, while retaining a suitable level of service for existing residents in the immediate area.

29. On this basis the following assessment of effects will consider:

- The ability for the proposal to provide adequate car parking and safe vehicular access and circulation.
- The daily and peak hour volume of traffic estimated to be generated by the proposal and its distribution onto the surrounding road network; and
- The ability of the surrounding road network to cater for increased traffic flow.

Car Parking, Vehicular Access and Circulation

30. It has already been stated that any residential development on the application site could comply with all of the relevant transport related requirements of the District Plan. This includes adequate parking, access and manoeuvring for each future residential house on each new allotment.

31. Given the size of the application site and the small number of allotments likely to be created, together with the three road frontages, no internal roads are likely to be required. A likely scenario is for at least 8 of the proposed allotments to have direct vehicle access from the adjoining road frontage (including 3 from Pocock Road, 3 from Annavale Road and 2 from the un-named road). A further right-of-way is likely to serve the remaining 6 allotments. This is likely to connect with Annavale Road and would align favourably with the access requirements contained in the District Plan.

32. The ODP layout is not dissimilar to many other subdivision concepts that have been evidenced in New Zealand over the past ten years. The design does not raise any particular or extra-ordinary traffic related concerns.

Daily Traffic Generation

33. It is considered that approximately 14 residential allotments could be created within the application site. Three of these are likely to have access directly to Pocock Road, nine directly to Annavale Road (including six from a right-of-way access), and two from the un-named road.

34. There is a substantial library of traffic generation research on the traffic generation of residential development. This data reveals a range of 4-14 trips per day per dwelling unit. An analysis of traffic effects arising from suburban residential land development is typically based upon a generation rate of 10 trips per dwelling unit per day.

35. However the traffic generation research also indicates that the trip generation per dwelling unit is influenced by proximity to non-residential activities (shopping, schools, work places and general entertainment and other amenities), and the separation distance from the primary commercial district for the wider area (research indicates that increased separation distance from a major CBD results in more trip linking and a lower overall generation rate per dwelling unit). The location of the site within a small provincial community with rural-residential characteristics suggests that a generation rate of 6 (or less) trips per day per unit is considered appropriate. A trip generation rate of around **6 trips per dwelling unit per day** will be used for this assessment.

36. **It therefore follows that development of the site with say 14 residential allotments could generate around 84 vehicle trips per day** (14 allotments x 6 trips each per day = 84). It is important to note that this level of traffic generation

would not occur immediately but would occur over time as the application site was developed.

Peak Hour Traffic Generation

37. It has already been estimated that the proposal will generate around 84 vehicle trips per day. However it is the peak hour traffic generation of the site and the effects of this additional traffic on the operation of the surrounding road network that is usually the primary traffic consideration.

38. Traffic generation research indicates that the peak hour traffic generation of suburban residential development is around 10% of the daily traffic generation. In this situation this calculates to around 8 trips to and from the site (84 daily trips x peak hour factor of 10% = 8vph).

39. This peak hour generation is also likely to be tidal in nature where most of the peak hour traffic would be exiting the subdivision during the morning peak hour and then returning during the evening peak hour. Assuming a split of 80% exiting and 20% entering the site this could include 6 vehicles leaving the site and 2 vehicles entering the site in the morning, with the reverse in the evening (8 peak hour trips x 80% leaving = 6; and 8 peak hour trips x 20% entering = 2).

40. This level of traffic is not significant and represents less than two vehicle movements every 15 minutes over the busiest hour of the day. For the remainder of the day, traffic volumes are likely to be lower.

Traffic Distribution

41. It is envisaged that most (if not all) traffic will travel in a southerly directly along Pocock Road (towards SH73) or in a south-easterly direction along Annavale Road and then Tramway Road which provides access to the train station, fire station, and school etc.

42. Given the low overall level of traffic likely to be generated from the site, any associated traffic generation effects on any of the adjoining road network will most likely be indistinguishable when compared to the existing environment.

43. The existing level of traffic on Pocock Road (≈165vpd), coupled with the proposed site generated traffic (≈84vpd, assuming all site generated traffic does in fact use Pocock Road) would equate to a total of around 250 vehicle movements per day on the immediately adjoining road network. This level of traffic is not significant in the context of anticipated traffic volumes on local roads and is compatible with the volumes of traffic generated by similar roads within the Selwyn District. That said the surrounding road network including carriageway width and intersection treatment still requires consideration. This will be addressed in the section that follows.

Road Network Effects – Local Network

44. *Local* roads (such as Pocock Road and Annavale Road) have a primary function of providing property access. From a traffic perspective, vehicle access from the application site onto these roads (and other local roads) is therefore entirely appropriate.

45. Table E13.8 (Road Standards) in the District Plan specifies appropriate widths for new roads within the District. Given that the activity will utilise existing roads (and

is not likely to necessitate any new roads that would be vested in Council) this Table technically does not apply. It does however provide some guidance as to what is considered appropriate within the Selwyn District. This specifically states that *local* roads within the Living 2 zone can operate with a minimum carriageway width of 6.0 metres. Furthermore, and owing to the low volumes, no dedicated infrastructure is required for pedestrians and cyclists.

46. Pocock Road currently has a sealed carriageway width of 6.0 metres and therefore already aligns with the Council expectations as stated in the District Plan and the Engineering Code of Practice.

47. Annavale Road however is currently metalled would ideally would need to be upgraded to a more suitable standard to carry the likely traffic volumes. Discussions with the Council have indicated that Annavale Road should be sealed for a distance of at least 100 metres back from Pocock Road. This should be constructed to a similar standard as Pocock Road (i.e. 6.0 metres wide) and extend for a distance that at least lines up with any proposed right-of-way. Thereafter the existing metalled road would be appropriate because of the lower number of allotments it serves.

48. The Annavale Road/Pocock Road intersection would also need to be included with any adjoining seal upgrades. This intersection is already controlled by a give-way sign and should be retained. It would however require appropriate seal markings to highlight the intersection in much the same manner as is provided on the Tramway Road leg of the same intersection. These issues can all be resolved at the time of subdivision.

49. The Annavale Road/Un-named Road intersection might also benefit through some rationalisation of the road to form a more conventional intersection layout. This issue could also be addressed at subdivision stage and could for example include the vesting of some land in Council for this to occur.

Road Network Effects – State Highway 73 Intersection

50. It has already been stated that most (if not all) traffic will pass through a T-intersection that joins SH73. The existing intersections (including Pocock Road/SH73 and Tramway Road/SH73) are already provided with good visibility and are constructed to an appropriate standard. Given the low overall traffic volumes, no upgrades to these intersections are warranted.

51. The ability of SH73 to absorb existing and site generated traffic from Pocock Road (for example) has been tested using the Tanner (1962) method advocated in Austroads *Guide to Traffic Engineering Practice – Part 5: Intersections at Grade* (SIDRA has not been used for a simple T-junction analysis of this type). The parameters are summarised in Table 1 below. Note however that this assumes that all existing minor stream volumes (along Pocock Road) have all been loaded into the same lane and are all flowing one-way into the intersection. The analysis also assumes that all vehicles will carry out a right-turn movement onto the State Highway (i.e. the most difficult). This has been done intentionally so as to ensure a robust assessment and therefore provides some additional margins of comfort.

[see Table 1 on the following page]

Table 1: Proposed T-Junction Access onto SH73 from Pocock Road

Parameter	Performance
Major Stream Volume (SH73) (NB: This has been based on 2011 NZTA daily count of 1,600vpd and a peak hour factor of 15% = 240vph).	240 vph
Minor Stream Volume (Pocock Road) [NB: This assumes that: • All of the existing traffic volume on Pocock Road (17vph) are travelling towards the SH73 intersection (165vpd x 10% peak hour factor = 17vph); and • This includes the additional 8vph site generated volumes from Paragraph 39 above – and assumes that it all travels southbound towards the SH73 intersection; and • All traffic will turn right at the SH73 intersection].	25 vph
Critical Acceptance Gap*	5 seconds
Follow Up headway**	3 seconds
Average Delay	1 second
Level of Service***	A

* Critical Acceptance Gap: The minimum gap in a traffic stream which will be accepted by entering drivers.

** Follow-Up Headway: The average headway between successive vehicles entering the same gap in a moving traffic stream from a stationary queue.

*** Level of Service has been extracted from the Highway Capacity Manual which suggests delays less than 15 seconds represent LOS A.

52. Table 1 above, shows that the proposed T-junction access will perform to a high level of service based on maximum existing and proposed volumes. As such, it is considered that the anticipated traffic function of the frontage road will not be compromised and road improvements are not warranted.

CONCLUSION

53. The preceding transportation assessment relates to an application to rezone a site currently zoned rural for residential purposes. It is considered that approximately 14 residential lots could be created if the site is developed in accordance with the ODP and the Living 2 rules.

54. The key traffic related issues with the proposal relate to the amount of traffic estimated to be generated by residential development of the site, and the effects of this additional traffic on the safe and efficient operation of the surrounding road network. It is estimated that the proposal could place an additional 84 vehicles per day onto the road network. This additional traffic will all utilise Annavale Road, Pocock Road and/or Tramway Road for part of their journey before integrating with the wider road network via a state highway T-junction.

55. With the recommended sealing of part of Annavale Road to a width of 6.0 metres, the road network has sufficient geometric capacity to cater for the estimated additional traffic from full development of the applicant's site. The proposal will have little effect on the levels of service and levels of delay in the immediate area and as such the traffic effects of this proposal on the operation of the surrounding road network are considered to be less than minor. Accordingly, the proposed Plan Change can be supported from a traffic perspective.