Planning. Traffic. Development.

Integrated Transport Assessment

prepared for

SELWYN DISTRICT COUNCIL

Prebbleton Park

April 2020

Integrated Transport Assessment

prepared for

Selwyn District Council

Prebbleton Park

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Document Date:	06/05/2020
Document Version/Status:	Final v.3
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Introduction

1. Selwyn District Council has commissioned Novo Group to prepare an Integrated Transport Assessment (ITA) for Prebbleton Park. The proposed layout is shown in **Figure 1** below.

2. This report provides an assessment of the transport aspects of the proposed development. It also describes the transport environment in the vicinity of the site, describes the transport related components of the proposal and key transport provisions in the District 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 and other relevant best practice guides.

3. It is proposed to develop a 22 hectare area of rural land at 27 Hamptons Road in Prebbleton for a community park. The Park will include three full sized fields and five junior fields to accommodate various sporting codes – together with ancillary changing room and separate toilet blocks. There is also a fenced dog exercise area and a meadow which may be developed for additional fields in the future. The main car park will be accessed from Birchs Road providing for approximately 250 car parks which will be sealed. A second car park will be provided from Leadleys Road which will accommodate around 35-45 spaces and provide access to the dog park. The remainder of the park provides for natural / landscaping areas and passive recreation.

Figure 1: Proposed Reserve Layout

Transport Environment

Road Network

Birchs Road

4. Birchs Road is classified as a collector road with an 80km/h speed limit (reducing to 60km/h immediately north of the intersection with Hamptons Road). Birchs Road has a 7.3m wide carriageway which provides for one traffic lane in each direction and has flush grass berms on both sides. A 2.2m wide shared path forming part of the Rail Trail is provided on the eastern side.

5. The Mobile Road website estimates traffic volumes on Birchs Road as approximately 5,319 vehicles per day.

Figure 2:Birchs Road looking South (towards Lincoln)

Hamptons Road

6. Hamptons Road is classified as a local road outside the site – and terminates approximately 300m to the east. This road however reverts to an arterial route to the west of Springs Road – approximately 1km to the north-west and has a posted speed limit of 80km/h. Hamptons Road outside the site has a metalled surface, although is sealed at the approach to the intersection with Birchs Road. Hamptons Road has a formed width of approximately 5.1m.

7. The Mobile Road website estimates traffic volumes on this section of Hamptons Road as approximately 64 vehicles per day.

Figure 3: Hamptons Road, outside the site looking west (towards Birchs Road)

Leadleys Road

8. Leadleys Road is classified as a local road with an 80km/h speed limit. Leadleys Road has a sealed width of approximately 5.8m with wide grass berms.

9. The Mobile Road website estimates traffic volumes on this section of Leadleys Road as approximately 685 vehicles per day.

Figure 4: Leadleys Road looking west (towards Birchs Road)

Crash History

10. The NZ Transport Agency Crash Analysis System (CAS) has been reviewed to identify crashes that have been reported on the frontage roads between 2009-2019. Two reported crashes were identified.

11. One crash occurred on Birchs Road, 20m north of the intersection with Leadleys Road as a result of a collision with a farm animal. This resulted in one fatality and one minor injury.

12. The second crash occurred at the intersection of Birchs Road and Leadleys Road as a result of a vehicle turning right failing to give way and colliding with a south bound cyclist. There was one minor injury.

13. The crash summary report from the CAS database is included in **Appendix 1**.

Alternative Transport Modes

Passenger Transport

14. The number 80 bus route (Lincoln to Parklands) operates along Birchs Road with a bus stop south of the intersection with Hamptons Road. Buses typically operate with 30 minute frequencies during the day with hourly frequencies in the evenings.

Cycling

15. The Rail Trail Cycleway is located on Birchs Road providing a link from Christchurch to Little River via Prebbleton and Lincoln.

The Proposal

16. The masterplan indicates that Prebbleton Park will provide for three full sized fields and five junior fields. This will accommodate a variety of codes such as cricket, soccer, rugby, touch rugby, frisbee and croquet. The meadow area may also be developed for additional fields in the future. Ancillary amenities are also provided including toilets / changing rooms (a club room may be considered in the future).

17. The remainder of the site provides for natural / passive recreation, play-grounds, a dog park and youth related facilities – including a basketball half-court.

18. The site will provide for 250 car parks in the main car park from Birchs Road, which will be sealed. During off-peak periods, parts of the car park may be used as additional hardstand areas for sports / recreation such as skating, roller blading and roller hockey. An additional car park accessed from Leadleys Road will provide access to the dog park in the south-east corner and will accommodate around 35-45 car parking spaces. Detailed parking layouts have not yet been developed however standard parking modules can be readily achieved as can compliant mobility parking.

19. 28 cycle parks are to be provided in several locations to cater for any cycle parking demand.

20. A shared path will be provided into the site which connects to the Rail Trail. This could be in addition to the existing path or replace the existing section of path. This will be discussed further below.

21. It is also proposed to reduce the speed limit on Birchs Road, Hamptons Road and Leadleys Road to 60km/h adjacent to the site.

Traffic Generation and Parking Demand

22. Recent surveys of the parking demand associated with Junior Rugby games at the existing Kirwee Reserve identified a peak parking demand for 87 and 185 vehicles on a typical Saturday and a Club Day respectively, with two fields operating concurrently. This equates to a typical parking demand for 44 spaces per field. It is noted that the Club Day volume is likely proportionate to the size of the club (membership) rather than the number of fields. There may not necessarily be a liner relationship between parking demand and the number of fields as not all fields are used concurrently.

23. Other traffic generation and parking demand for the various activities is estimated below. This has been extracted from survey data (where available) and from first principles. This is set out in **Table 1** below.

Table 1: Survey information from NZ Trips and Parking Database

Facility surveyed	Site and survey info	Parking Demand	Trip Generation
Bay City Park, North Shore	3 Soccer Fields Sat. 9am -5pm	55 spaces / field	38 trips / hour / field
Silverdale War Memorial Park, Rodney	3 Rugby Fields, 2 tennis courts, 1 hockey pitch, 3 bowling greens, Pony club. Sat in May	283 peak parking demand	318 trips
Ilam Fields, Christchurch	Wed 1200-1700 June. 4 Rugby fields and clubhouse	168 peak parking demand	102 vehicles per hour

Rugby

24. The peak period associated with the Rugby fields typically occurs in the mornings when several junior rugby games are occurring at once. Five junior fields are proposed which could accommodate up to five games occurring simultaneously. Applying the Kirwee survey to this site suggests a typical parking demand of 220 spaces if games did occur concurrently on all fields (which is unlikely).

25. As a proxy for estimating traffic generation, the Silverdale survey identified turn-over of around 1.12 trips per parked vehicle[1] (the Ilam Fields survey suggested only 0.6 trips per parked vehicle, although it is not clear if this was associated with a training session or games). Applying the higher of these rates to the estimated 220 space parking demand suggests a traffic generation of 246 trips in the peak hour. This aligns well with the

[1] Apply the traffic generation to parking demand as a ratio (i.e., 318 trips / 283 space demand = 1.12 trips per vehicle in the peak hour).

operational observations which suggest vehicle parking duration is typically more than one hour. This accounts for warm-up times, game time, and after-game time lags. Furthermore, some cars will also be associated persons playing in or supporting more than one team etc.

26. Senior games typically have around 25 people (players and coaches, refs etc) per team. Accordingly, three senior fields could have up to six teams at any one time (150 people). With a conservative car occupancy of 2 people per car, this would equate to around 75 vehicles. Spectator volumes are more difficult to estimate; however, it is unlikely that parking demand would be higher than that which occurred during the surveyed junior games. The games are also longer than one hour and typically have greater gaps between games that are scheduled on the same fields hence there is also unlikely to be the same level of traffic generation as occurs in association with the junior games.

27. Some of the visiting senior teams also charter a bus, reducing the traffic generation and parking demand from that assessed above. Where buses are expected, a small number of car parks are coned off to provide for the bus parking.

28. Trainings typically occur on weekday evenings and are expected to be lower with typically only one team per field and no additional spectators (i.e., none other than parents driving children to the practise). Junior and Senior training times do not typically coincide (with junior trainings typically occurring earlier in the evening)

Soccer

29. The Bay City survey data above suggested a parking demand of 55 spaces per field – which we have assumed relates to senior games. This would suggest that three senior fields would create a demand for 165 spaces.

30. Junior games are likely to generate a similar parking demand to the junior rugby (noting the similarities in respect of age group games, smaller teams than seniors and parents spectating).

Cricket

31. Senior cricket matches typically have around 11 players (with only 1 or 2 reserves) and occur over several hours. Junior grades have shorter games and may be less than one hour. Senior cricket games also attract some spectators, coaches and organisers therefore an estimated 50 people per game would generate 25 vehicles however these would not likely arrive and depart in the same hour. Junior games may generate around 30 players and coaches (with a similar number of parents watching) and turn-over within an hour (estimated 60 trips). Cricket is also a summer sport only, so would not coincide with winter sporting codes.

Other field games

32. We are not aware of any survey data available for Frisbee or Croquet however it is unlikely that these codes have membership numbers as high as that occurring for Soccer and Rugby and as such the traffic generation of these codes is not likely to exceed that considered above.

Dog Park

33. We are not aware of any survey data for local dog parks. Casual observations suggest the demand also varies noticeably between different parks and across a day. A review of existing dog parks in Canterbury suggests that parking provision ranges between 11 and 30 spaces. Whilst it is unclear how the parking supply relates to demand, the 35 spaces provided adjacent to the dog park appear to be greater than that provided elsewhere and appropriate noting the rural location. Given the overall supply, we are confident that the parking along the grass berms outside the site would not be warranted.

34. Casual observations also indicate wide variability in duration of stay from around 20 minutes to over one hour. Adopting an average of 40 minutes and assuming the car park was full during the peak period this suggests a peak hour traffic generation of up to 105 vehicle movements[2].

Passive Recreation

35. The walking tracks, playgrounds. Etc. will likely generate some vehicle movements throughout the day with peak periods after school and work and on weekends. A small allowance for peak hour traffic is included for these uses as there is likely to also be some overlap with visits to the site for organised sport (i.e., a parent walking the dog whilst a child has practise, or a sibling using the pump track whilst another is playing etc.). An allowance of 10 vehicles associated with passive recreation is considered to be sufficient to include any additional traffic coinciding with the peak sporting periods.

Total

36. Peak demand is likely to occur during the winter months. Noting that junior and senior winter sports games typically occur at different times, the peak period can be summarised below:

Table 2: Estimated Peak Periods (winter)

Sport	Parking demand	Traffic generation (hourly)
Rugby / Soccer	220	246
Passive Recreation	10	20
Dog Park	35	105
Total	**265**	**371**

37. It is emphasised that this represents a worst case estimate of parking demand and traffic generation which would only occur very occasionally during the busiest period under near full utilisation of the park facilities. Regardless the parking provision exceeds this estimated demand and as such, parking demand can be readily met with the proposed supply.

[2] 35 spaces, turn-over on average 1.5 times per car park, two trips per vehicle = 105 movements.

38. Traffic generation and access related effects are assessed in the subsequent sections.

District Plan Assessment

39. Designations are not required to comply with the rules in the District Plan however the Transport Standards in Appendix E10 (Rural) and E13 (Township) have been considered for guidance. These are also incorporated into **Appendix 1**. The proposal is consistent with all District Plan standards except in respect of:

    - A maximum of three vehicle crossings are permitted per site, four are proposed (including the emergency access)

40. It is noted that the car park layouts have not been determined at this stage however there is sufficient space to achieve compliant queuing and car park dimensions.

41. The assessment has been undertaken on the basis of the proposed 60km/h speed limit.

Assessment of Effects

42. The key transport related effects can be grouped into topics of parking, on-site layout / circulation, access, and the road network. The effects of each of these aspects are assessed below.

Parking

43. The analysis outlined above suggests that there is ample parking provision within the main and dog park car parks to cater for the estimated peak parking demand (refer to **Table 2**).

44. During off-peak periods part of the main car park is proposed to be used as additional hardstand areas for recreation / sports activities. Regular parking demand will be significantly lower than the weekend / competition day peak parking demand and parts of the main car park can easily be sectioned off without affecting access or circulation. Noting that any adverse effects can be readily managed by sectioning off the surplus parking area during off-peak demand, the proposed uses represents an efficient use of the space that would otherwise be un-used for the majority of the week.

45. The District Plan would suggest a minimum of 28 cycle parks and it is proposed to provide this. . It is recommended that these are split into several locations around the site including close to the changing room / public toilet, near the dog park and near the youth space.

On-Site Layout

46. The parking layout will be finalised through the detailed design phase however it is recommended that the main car park be adjusted to provide for standard parking modules being 16.6m min. for a row of car parks each side of an aisle (i.e., 5.0m long stall, 6.6m wide aisle and 5.0m long stall) or 33.2m min. where four rows are provided with two aisles. This represents an efficient layout that aligns with both the Australian/New Zealand Standard and the District Plan, and is a reasonably intuitive shape to encourage effective

parking to occur in the metalled areas where parking spaces are not formally marked. Two connections should be provided to allow for vehicles to circulate and/or move between each area of the car park.

47. Consideration may need to be given to enabling parts of the car park to be gated to avoid undesirable behaviour when car parks are empty or during late evening hours.

48. The Birchs Road access should provide for a minimum of 25.5m queuing space and this can be readily achieved.

49. The dog park access should provide for a minimum of 10.5m queuing space and this too can be readily achieved.

50. The car parks are located along the western and southern parts of the Park and there are good pedestrian connections to the various features within the Park.

51. A pedestrian link is also provided from the northern end of Birchs Road to the future Meadow which will cater for the dominant flow of pedestrian movements to and from the North (Prebbleton Township) and the bus stop on Birchs Road.

52. The proposed connection to the Rail Trail and additional paths within the site provides good access for cyclists to the main areas within the park.

Access

53. The main car park takes access from Birchs Road via a single access, noting that this is a collector road and that it will necessitate crossing the existing Rail Trail path. Subject to appropriate design, it will be sufficient to accommodate the anticipated traffic volumes (refer to **Appendix 3**). It is also noted that during the peak periods there will be multiple different games occurring with differing start and finish times which will spread the traffic generation more evenly over the peak hours.

54. An emergency access point is also provided for the main car park which can be opened in the event of a crash or other emergency event where the main access may not be available or sufficient on its own. Noting that this would be rare and infrequent, this access would only be opened when needed. This could be administered by club members, Council and/or emergency services – or a combination of all.

55. Several access designs for the main car park access were considered and the most preferable solution was to extend the 60km/h speed limit to a point south of Leadleys Road. This avoids the need for acceleration and deceleration lanes, which would be difficult to achieve within the road reserve width available. The 60km/h speed limit proposed also reduces the risk of serious injury and fatal crashes particularly associated with right turns into and out of the site. The 60km/h speed limit is also more consistent with the higher pedestrian and cyclist volumes that may occur near the Park (walking to Prebbleton, the bus stop etc).

56. Noting the proposed 60km/h speed limit, the access can be formed with standard radius and tapers and some seal widening on the opposite side of the access. These measures can be readily accommodated within the current road reserve space available. The shared

path can be curved to cross the access in a similar layout to that at the Leadleys Road intersection). A simple Tanner Analysis suggests that the delay for vehicles turning right into the site would be around 3.6 seconds and around 9.2 seconds for a right turn exit movement. A dedicated right turn lane would therefore not be required from a capacity perspective.

The access to the dog park is located on Leadleys Road and is well separated from the intersection and achieves excellent visibility in both directions. Noting the lower traffic generation at this access and lower traffic volumes on Leadleys Road, and the proposed 60km/h speed limit, no additional seal widening is necessary at this point.

57. The Hamptons Road service access is well separated from the intersection of Hamptons Road with Birchs Road. Noting the low volume of traffic anticipated at this access and that most users would be staff who would be familiar with the site, the access design can be dictated by the largest vehicles using the service lane (i.e., splays to accommodate the turning radius of any heavy vehicles for which access which may be required). The service space is of sufficient size that vehicles would not be required to reverse off the site.

Road Network

58. The site is located on Birchs Road which is classified as a collector road and provides a key traffic connection between Lincoln and Prebbleton. This provides good connections to these townships and the wider road network and is likely to cater for the majority of travel to and from the site. Noting the existing traffic volumes on Birchs Road and the level of traffic generation anticipated, the traffic volumes will remain well within the capacity of a sealed two-way road[3]. It is also noted that the busiest periods typically occur on weekends outside of the peak commuter periods.

59. The site also provides access from Leadleys Road which connects to State Highway 76 for vehicles travelling to / from Tai Tapu and Halswell. The existing traffic volumes on Leadleys Road are relatively low and noting the level of traffic generation associated with this site will comfortably stay within a reasonable volume for a rural local road[4].

60. Some traffic to / from the west may also arrive via Hamptons Road, turning right onto Birchs Road to access the site. Noting there are also several other connections from Birchs Road toward the west, the proportion of vehicles utilising this route is not anticipated to be high. This section of Hamptons Road is a sealed local road. The existing formation of Hamptons Road can accommodate a small increase in traffic to / from this direction.

61. The majority of traffic is likely to use the Birchs Road access. There may be some increase in turning movements at the intersection of Leadleys Road and Birchs Road associated with vehicles to the dog park and or those parking close to the eastern-most playing fields. There may also be a small proportion of traffic approaching from the east that turn onto Birchs Road and use the main car park (which is closer to the clubrooms and junior fields). Leadleys Road forms a “T’ intersection with Birchs Road. The existing layout provides an approximately 12m wide limit line which allows for a left and right turning vehicle to wait /

[3] Around 900 vehicles per hour per lane for an edge side lane (Source: Austroads Guide to Traffic Management Part 3).
[4] For example Leadleys Road is anticipated to stay below 1,000 vehicles per day which is consistent with that for a Rural Local Road specified in Table 3.2 of the New Zealand Standard for Land Development and Subdivision Infrastructure (NZS4404:2010)

turn simultaneously (i.e., effectively provides for a left and right turn lane) and this will likely be sufficient to cater for any increased turning demand from Leadleys Road to Birchs Road. There is no right turn lane provided on Birchs Road however there is an existing sealed shoulder which allows for through traffic to pass around right turning traffic waiting at the intersection. The right turn volume should be monitored over time however it is generally anticipated that this would not be sufficient to warrant a dedicated right turn lane on Birchs Road.

62. Hamptons Road forms a cross-roads intersection with Birchs Road with priority afforded to traffic on Birchs Road. Both sides of Hamptons Road are stop controlled. The eastern arm of Hamptons Road is a dead-end road and as such through and turning volumes associated with this approach are not anticipated to be high. Furthermore, only service vehicle access is proposed to the Park from Hamptons Road and therefore any increase in traffic would be minimal and not likely to noticeably impact on the existing level or service or safety. Any increase in turning movements associated with the site would be anticipated to be right turns from Hamptons Road (west approach) onto Birchs Road and left turn movements from Birchs Road onto Hamptons Road. These can be readily accommodated by the existing formation of that intersection.

63. The site is also located on a bus route that provides for public transport connections from Lincoln, Prebbleton and Christchurch. For a rural location this is considered to provide a good level of public transport access.

64. Overall, the site is considered to be appropriately located within the road network and the surrounding road network is considered to have adequate physical capacity to cater for the anticipated increase in traffic generation.

Summary

65. The site is anticipated to be self-sufficient in respect of car parking demand and there is ample space to achieve standard parking modules, good circulation for park search routes and provision for mobility parking. 25.5m queuing space is recommended and can be achieved at the main car park access and 10.5m at the dog park access.

66. The site is well connected to the Rail Trail and provides a number of walking and cycling connections through-out the site. It is proposed to provide 28 cycle parking spaces split across several locations which will likely cater for demand and there is ample space to provide additional cycle parks should demand warrant this in the future.

67. The site is well located within the road network for access by motor vehicle from all major destinations and is also accessible by public bus from Prebbleton, Lincoln and Christchurch.

68. Safe and efficient access to and from the site can be achieved from the main car park and dog park car park. A second exit point from the main car park provides for an alternative point of egress in the event of an emergency at the main access. The separate service access is appropriately located to accommodate the associated maintenance vehicles.

69. Extension of the 60km/h speed limit on the frontage roads Road has a number of benefits in respect of the increased concentration of vehicles, pedestrians and cyclists associated

with the Park as well as in respect of access design and reducing the risk of serious / fatal crashes associated with an increased number of turning vehicles.

Appendix 1

NZTA CAS Data

Untitled query

Crash year

2009 — 2019

Saved sites

Prebbleton Park

Plain English report

2 results from your query.

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Crash road	Distance	Direction	Side road	ID	Date	Day of week	Time	Description of events	Crash factors	Surface condition	Natural light	Weather	Junction	Control	Crash count fatal	Crash count severe	Crash count minor
BIRCHS ROAD	20m	N	LEADLEYS ROAD	201300255	05/12/2013	Thu	21:53	Car/Wagon1 SDB on BIRCHS ROAD hit obstruction, Car/Wagon1 hit animals (driven or led), i.e. under control	CAR/WAGON1, alcohol not suspected, tested and -ve (mot use onl, ENV: farm animal straying	Dry	Dark	Fine	Nil (Default)	Unknown	1	0	1
BIRCHS ROAD		I	LEADLEYS ROAD	201121970	06/06/2011	Mon	15:00	Cycle1 SDB on BIRCHS ROAD hit Van2 turning right onto AXROAD from the left	VAN2, failed to give way at priority traffic control, misjudged another vehicle	Dry	Overcast	Fine	T Junction	Give way	0	0	1

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Appendix 2

Transport Compliance Assessment

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT
It is noted that the Transport Rules of the District Plan do not apply to Designations however the Transport standards in Appendices 13 (Township Volume) and 10 (Rural Volume) have been considered below as a guide.	
E10.1.PARKING REQUIREMENTS	
E10.1.1.1 Any on-site car parking or loading space located between the road frontage and the main entrance of any educational facility or any activity involving the retailing of goods and services to the public shall not have a metalled surface. Notes: (a) The reason for Rule E10.1.1.1 is to avoid the potential for stones to "fly up" from the tyres of vehicles, which may create a danger to school children and the public in general. (b) Table E10.1 below provides a guide for the marking out of car parking spaces in the case of the developer or landowner wishing to provide a parking surface which is formed and sealed. (c) The discharge of storm water from a large sealed area may require a discharge consent from Environment Canterbury.	N/A
E10.1.2.1 Any area required for on-site parking or loading, other than for a residential activity, shall be available at all times for staff and visitors during the hours of operation of the activity and shall not be diminished by any subsequent erection of any structure, storage of goods, or any other use.	Complies
E10.1.2.2 Garageable parking spaces for any residential activity shall have the following minimum internal dimensions:	N/A
E10.1.3.2 The minimum width of the entrance to a single garage shall be 2.4 metres.	N/A
E10.1.3.3 Any other parking space for any residential activity shall have the following minimum dimensions:	N/A
E10.1.4.1 The gradient of any on-site parking or loading area for any non-residential activity, shall be no more than: (a) At 90° to the angle of parking - 1:16; or (b) Parallel to the angle of parking - 1:20	Will comply
E10.1.5.1 The manoeuvring area to and from any parking space shall be designed to accommodate at least the design motor car as set out in the Council's Engineering Code of Practice.	Complies
E10.1.5.2 The manoeuvring area to and from any loading space shall be designed to accommodate at least the design truck as set out in the Council's Engineering Code of Practice.	N/A

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT
E10.1.5.3 No loading space shall obstruct any on-site car parking space or any vehicle or pedestrian access.	N/A
E10.1.5.4 No vehicle shall be required to reverse out of any site onto a road.	No vehicles will reverse out of the site

E10.2 ACCESSWAYS AND CROSSINGS	
E10.2.1.1 The minimum requirements for any shared private vehicle accessway for a site(s) shall be in accordance with Table E10.2. 2-3 Sites 4.5m legal width, 3.0m carriageway, turning areas and optional passing bay	N/A the accesses are not shared with other sites.
E10.2.1.2 Where Table E10.2 requires turning areas, turning within the shared accessway may be facilitated through the use of a hammerhead arrangement. Note: refer to the Council's Code of Practice for the design standard required.	N/A
E10.2.2.1 No part of any vehicle crossing shall be located closer to the intersection of any road than the minimum distances specified in Table E10.3 except that where the boundaries of a site do not allow the provision of any vehicle crossing whatsoever in conformity with the above distances, a single vehicle crossing may be constructed in the position which most nearly complies with the provisions of Table E10.3. (the Road Hierarchy for the District is set out in Appendix 9).	The vehicle accesses on Birchs Road and Leadleys Road are more than 60m from the nearest intersections. The service crossing is also more than 60m from the intersection of Birchs Road and Hamptons Road.
E10.2.2.2 No part of any vehicle crossing shall be located closer than 30 metres to the intersection of any railway line as measured from the nearest edge of the vehicle crossing to the limit line at the level rail crossing.	There are no railway crossings within 30m of the site.

		Intersecting Road Type Distances in Metres			
Vehicle Crossing Joins to	Posted speed Km/hr	State Highway	Arterial	Collector	Local
State Highway	> 50	100	100	100	100
	≤50	30	30	30	30
Arterial	> 50	100	100	100	100
	≤50	30	30	30	30
Collector	> 50	75	75	60	60
	≤50	30	30	30	25
Local	> 50	75	75	60	60
	≤50	25	25	25	10

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT
E10.2.2.3 The distance between any vehicle crossing and road intersection shall be measured along the centre line of the frontage road: (a) From the point where the centre lines of the two roads intersect; (b) To the point where the centre lines of the vehicle crossing and the frontage road intersect.	Noted
E10.2.2.4 Notwithstanding Rule E10.2.2.1 above, for any: (a) service station; or (b) truck stop; or (c) any activity which generates more than 40 vehicle movements in any one day; No part of any vehicle crossing onto any State Highway road or arterial road shall be located closer than: (d) 60m to the departure side of any intersection; and/or (e) 30m to the approach side of any intersection. The distance shall be measured in accordance with Rule E10.2.2.3.	The site does not have a vehicle crossing to a State Highway or Arterial Road
E10.2.3.1 Vehicle crossings onto roads must provide the required minimum sight distances in Table E10.4 and Diagram E10.A1.	Birchs Road is straight and flat with visibility achieved in both directions. Visibility is not required on Leadleys Road or Hamptons Road as they are local roads.

Posted (Legal) Speed Limit (km/h)	State Highway, Arterial and Collector roads Required Sight Distances (m)
50	113
60	140
70	170
80	203
90	240
100	282

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT
E10.2.4.1 Vehicle access to any site from any road or service lane shall be by way of a vehicle crossing constructed at the owner's or the developer's expense.	Noted
E10.2.4.2 The maximum number of residential vehicle crossings shall not exceed 1 per road frontage.	N/A
E10.2.4.3 Vehicle crossings to any site shall be constructed in accordance with: E10.2.4.3.1 Diagram E10.B1 if the vehicle crossing is to provide access to a property from a State Highway with less than 30 equivalent car movements per day; or E10.2.4.3.2 Diagram E10.B2 if the vehicle crossing is to provide access to a property from a State Highway with between 30 and 100 equivalent car movements per day; or E10.2.4.3.3 Diagram E10.C1 if the vehicle crossing is to provide access to a dwelling and is to a local road; or E10.2.4.4.4 Diagram E10.C2 if the vehicle crossing is to provide access to a dwelling and is to an arterial road or provides access to any activity and is to a collector road; or E10.2.4.4.5 Diagram E10.D if the vehicle crossing is to provide access to a commercial activity or is a heavy vehicle access, other than State Highways.	The rural access arrangements are not applicable to a 60km/h speed environment.
E10.3 ROAD STANDARDS	
E10.3.1.1 Any new road shall be laid out and vested in the Council in accordance with the standards contained in Table E10.5.	N/A
E10.3.1.2 For determining the carriageway width in Table E10.5, the minimum carriageway widths shall be measured from the edge of seal to edge of seal. Local Roads: 15-20m Road reserve width and 6.7-7m carriageway width	N/A
E10.3.1.3 The carriageway of any new road laid out and vested in accordance with the above shall be formed and sealed.	N/A
E10.3.1.4 Any cul-de-sac shall be constructed with a turning head of 26m diameter measured kerb face to kerb face.	N/A

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT	
E10.3.2 Road Intersection Spacing (all roads)	N/A no new intersections are proposed	N/A
E13.1.1 Parking Spaces to be Provided		
E13.1.1.1 - For any new activity, or any increase in an existing activity not complying with Section 10 of the Act (Certain Existing Land Uses in Relation to Land Protected), provision shall be made for on-site vehicle parking, for use by staff and visitors, in accordance with Table E13.1(a), E13.1(b) and E13.1(c), and in compliance with the car park dimensions in Table E13.2 and Diagram E13.1.	Sports grounds and playing fields: 15 spaces per hectare of playing fields; Places of Assembly and/or Recreational Activities: 10 spaces per 100m2 public area or 1 space per 10 seats, whichever is greater Approx. 4.99ha of playing fields = 75 spaces. Or 6.09 if meadow included = 91 spaces Approx. 400m2 GFA = 40 spaces 131 spaces required. The parking provision exceeds this requirement. It is noted that off-peak use of the car park for roller skating etc has not been assessed in the above calculations as it would not occur concurrently with the peak use of the sports fields. Nor does it result in a higher requirement than the sports fields, accordingly the calculations above represent the highest requirement that may occur at any one time.	
E13.1.1.2 - If an activity is not listed in Table E13.1, the activity closest in parking demand to the new activity shall be used.	Noted	
E13.1.1.3 - Where there are two or more similar activities in Table E13.1 and there is uncertainty over which rate is most applicable, the activity with the higher parking rate shall apply.	Noted	
E13.1.1.4 - Where there are two or more different activities listed in Table E13.1 occurring on the site, the total requirement for the site shall be the sum of the parking requirements for each activity.	Noted	

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT
E13.1.1.5 - Where a parking requirement results in a fractional space, any fraction of one half or over shall be rounded up to the nearest whole number and any fraction under one half shall be disregarded except that there must be a minimum of one space for each activity.	Noted
E13.1.1.6 - Parking spaces for persons with impaired mobility shall be provided at the required rate (refer to Rules 5.5.1.5 and 17.5.1.4) and shall be included within the total requirement specified in Table E13.1.	1 space is required for up to 10 spaces and then 1 space per 50 car parks. The car park layouts have not yet been finalised but complying accessibility parking will be provided.
E13.1.1.7 - Where an application includes two or more activities, and the nature of activities is unknown, the activity with the highest parking rate shall apply.	Noted
E13.1.1.8 - The parking requirement for Food and Beverage activities is based on PFA. Where PFA is not specified or is unknown, the parking requirement shall be calculated based on GFA.	Noted
E13.1.2 Availability of Parking Spaces	
E13.1.2.1 - Any area required for on-site parking or loading, other than for a residential activity, shall be available at all times for staff and visitors during the hours of operation of the activity and shall not be diminished by any subsequent erection of any structure, storage of goods, or any other use, except as required in the Rolleston Key Activity Centre in Rule E13.1.3.4 below.	Will be available
E13.1.3 Parking Area Location	
E13.1.3.1 - All parking required in Table E13.1 above and all loading (including unloading) areas shall be located on the same site as the activity for which the parking is required. This rule shall not apply to any required parking which complies with Rules E13.1.3.3 and E13.1.3.4 below.	Yes.
E13.1.3.2 - Any parking or loading area for any activity in a Business zone shall not have its access across land in any Living zone, except for any parking provided in Rolleston Reserve pursuant to Rule E13.1.3.4.	N/A
E13.1.3.3 - Within a Business 1, 2 or 2A Zone, parking required in table E13.1 above may be provided on a physically adjoining site, or on a site within 100m of the site on which the activity is undertaken, provided that it meets the conditions of E13.1.3.5 in either of these situations.	N/A

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT
E13.1.3.4 - For Precinct 8 of the Rolleston Key Activity Centre, all car parking (required and/or provided) shall be provided in Precincts 1 and/or 6 in a public car park or public car parks, shall be available for general public use and shall meet conditions (c), (d) and (e) of Rule E13.1.3.5.	N/A
E13.1.3.5 (a) the parking shall be clearly associated with the activity by way of signage on both sites, or alternatively be available for general public use, and (b) the parking is located on the same side of any road as the activity, and (c) the most direct route provided or available for pedestrians from the parking area to the activity is not more than 200m and, (d) if disabled parking cannot be physically accommodated on the same site as the activity, shall be provided at the closest point to the entrance to the activity with which they are associated and, the most direct route from the disabled parking spaces to the activity shall be accessible for mobility impaired persons and (e) Parking on a separate site by an activity must be protected for the use of that activity (and any future activity on the activity site), or for the use of the general public, by an appropriate legal instrument. A copy of the appropriate legal instrument shall be provided to Selwyn District Council for their records. Note: Precinct 8 parking shall be protected for the use of the general public only.	N/A
E13.1.4 Cycle Parking	
E13.1.4.1 - Any activity, other than residential activities, temporary activities, activities listed in E13.1.4.2 and activities permitted under Part C, Living Zone Rules - Activities 10.9.1. is to provide cycle parking at a minimum of 2 spaces and then at a rate of 1 cycle space for every 5 car parking spaces required, to a maximum of 10 cycle spaces.	N/A
E13.1.4.2 - Any Place of assembly, recreation or education activity shall provide cycle parking at a minimum of 2 spaces and then at a rate of 1 cycle space for every 5 car parking spaces required.	28 cycle parks suggested (in an urban area) – 28 proposed
E13.1.4.3 - All cycle parking required by rule E13.1.4.1 or E13.1.4.2 shall be provided on the same site as the activity and located as close as practicable to the building main entrance and shall be clearly visible to cyclists entering the site, be well lit and secure. The type of stand must comply with the Engineering Code of Practice requirements for cycle parking rack systems	Noted
E13.1.5 Loading and Manoeuvring	
E13.1.5.1 - All loading and manoeuvring shall be carried out on-site. The manoeuvring area to and from the loading zone shall be designed to accommodate at least the design truck as detailed in the Council's Engineering Code of Practice.	Will occur on-site

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT
E13.1.5.2- No loading zone shall obstruct any on-site car parking space or any vehicle or pedestrian access. For clarification any loading spaces shall be in addition to parking spaces required in Table E13.1.	Noted
E13.1.6 Parking Spaces for Residential Activities	
E13.1.6.1 - Garageable parking spaces for any residential activity in any zone shall have the following minimum internal dimensions: Single 3.1m wide & 5.5m deep Double 5.6m wide & 5.5m deep	N/A
E13.1.6.2 - The minimum width of the entrance to a single garage shall be 2.4 metres.	N/A
E13.1.6.3 - Any other parking space for any residential activity shall have the following minimum dimensions: Width 2.5m Depth 5m	N/A
E13.1.6.4 - The manoeuvring area to and from the site access to the parking space shall be designed to accommodate at least the design motor car as set out in the Council's Engineering Code of Practice.	N/A
E13.1.6.5 - Where two parking spaces are required by for any residential activity (other than visitor spaces), they may be provided in tandem where onsite manoeuvring is provided.	N/A
E13.1.7 Gradient of Parking Areas	
E13.1.7.1 - The gradient for any on-site parking surface for any non-residential activity, shall be no more than: (a) At 90° to the angle of parking - 1:16 (b) Parallel to the angle of parking - 1:20	Will comply
E13.1.8 Maximum Gradients for Access to any Parking Space(s)	
E13.1.8.1 - The maximum average gradient of any access shall be 1 in 6.	Will comply
E13.1.8.2 - The maximum gradient shall be 1 in 4 on any straight section and 1 in 6 around curves, the gradient being measured on the inside line of the curve.	Will comply
E13.1.8.3 - The maximum change in gradient without a transition shall be no greater than 8°.	Will comply

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT
E13.1.9 On-site Manoeuvring	
E13.1.9.1 - On-site manoeuvring shall be provided to ensure that no vehicle is required to reverse either onto or off a site where: (a) Any site has access to a State Highway or arterial road (refer Appendix 7); or (b) Any site has access to a collector road and required 3 or more parking spaces; or (c) Any site containing a non-residential activity having access to a collector road; or (d) Any access to a site that serves 6 or more parking spaces; or (e) Any residential activity providing tandem parking.	All vehicles can drive forwards off the site.
E13.1.9.2 Parking spaces shall be located so as to ensure that no vehicle is required to carry out any reverse manoeuvring when entering any required parking space.	All car parks are located to enable a vehicle to drive forwards into the park
E13.1.9.3 Vehicles shall not be required to undertake more than one reverse manoeuvre when manoeuvring out of any required parking or loading space.	All car parks can be designed to enable this.
E13.1.10 Queuing Spaces	
E13.1.10.1 - A queuing space shall be provided on-site for all vehicles entering or exiting a parking or loading area. The length of such queuing spaces shall be in accordance with Table E13.3 below. Where the parking area has more than one access the number of parking spaces may be apportioned between the accesses in accordance with their potential usage.	Dog park (35-45 spaces) 10.5m – the final layout can achieve this. Middle car parks (250 spaces) 25.5m – there is ample space to achieve this.
E13.1.10.2 - The queuing space length shall be measured from the road boundary to the nearest vehicle control point or point where conflict with vehicles or pedestrians on established pathways already on the site may arise.	Noted
E13.1.11 Illumination	
E13.1.11.1 - Any parking and loading areas, (excluding those for any residential activity), which are required at night shall be illuminated to a minimum maintained level of 2 lux, with high uniformity, during the hours of operation.	CPTED considered by others.

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT
E13.1.12 Surface of Parking and Loading Areas	
E13.1.12.1 The surface of any parking, loading, and associated access areas (except parking areas for any residential activity) shall be formed, sealed and drained with the parking spaces permanently marked.	The sealed car parks will be permanently marked however the metalled spaces will not be.
E13.2.1 Private Vehicle Accessway	
E13.2.1.1 - The minimum requirements for any private vehicle accessway for a site(s) shall be in accordance with Table E13.4.	5m carriageway width, turning and passing areas – all accesses comply
E13.2.1.2 - The minimum height clearance for any private vehicle access shall be 4.5m.	Noted
E13.2.1.3 - Where a private vehicle access serves more than two allotments, in any zone, it shall be formed and sealed.	N/A
E13.2.1.4 - Where turning areas are required in Table E13.4, this may be facilitated through the use of a hammerhead arrangement. Note: refer to the Council's Code of Practice for the design standard required.	N/A
E13.2.1.5 - The minimum width of an accessway serving a single site in the Living Zones shall be 3.5m.	N/A
E13.2.2 Distances of Vehicle Crossings from Road Intersections	
E13.2.2.1 - No part of any vehicle crossing shall be located closer to the intersection of any roads than the minimum distances specified in Table E13.5 except that where the boundaries of a site do not allow the provision of any vehicle crossing whatsoever in conformity with Table E13.5, a single vehicle crossing may be constructed in the position which most nearly complies. (Note that the Road Hierarchy for the District is set out in Appendix 7).	All accesses comply (more than 60m from intersections).

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT

Table E13.5 – Minimum Distances of any Vehicle Crossing from Intersections

Intersection Road Type Distances in Metres					
Vehicle Crossing Joins to	Posted speed Km/hr	State Highway	Arterial	Collector	Local
~~Strategic~~ State Highway	> 50	100	100	100	100
	≤ 50	30	30	30	30
Arterial	> 50	100	100	100	100
	≤ 50	30	30	30	30
Collector	> 50	75	75	60	60
	≤ 50	30	30	30	25
Local	> 50	75	75	60	60
	≤ 50	25	25	25	10

E13.2.2.2 - In applying E13.2.2.1 the distances specified in Table E13.5 shall be measured along the road boundary parallel to the centre line of the roadway of the frontage road from the kerb line, or formed edge, of the intersecting road – refer to Diagram E13.5.	Noted
E13.2.2.3 - No part of any vehicle crossing shall be located closer than 30 metres to the intersection of any railway line measured from the nearest edge of the vehicle crossing to the limit line at the level rail crossing.	The access is not within 30m of a railway line
E13.2.3 Sight Distances from Vehicle Crossings	
E13.2.3.1 - Any access on any road shall have minimum unobstructed sight distances that comply with Tables E13.6 below and measured in accordance with Diagram E13.2.	All Roads are straight and flat affording more than 203m visibility.

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT

Table E13.6 – Minimum Sight Distances

Posted (Legal) Speed Limit (km/h)	State Highways and Arterials Required Sight Distances (m)	Collector and local roads	
		Living Zones Sight Distances (m)	Business Zones Sight Distances (m)
50	113	45	113
60	140	65	140
70	170	85	170
80	203	115	203
90	240	140	240
100	282	250	282

E13.2.4 Vehicle Crossing Design and Siting	
E13.2.4.1 - Vehicle access to any site from any road or service lane shall be by way of a vehicle crossing constructed at the owner's or developer's expense.	Noted
E13.2.4.2 - For all sites in a Living Zone there shall be a maximum of one vehicle crossing per site.	N/A
E13.2.4.3 - For sites in the Business 2A Zone with frontage to roads other than State Highway and Arterial roads, there shall be a maximum of two vehicle crossings per site except that: (a) There may be a maximum of three vehicle crossings per site where the road frontage is more than 100 metres in length.	N/A
E13.2.4.4- For sites in all other Business zones (excluding B2A zone) there shall be a maximum of one vehicle crossing per site, except where: (a) the site has frontage to roads other than State Highway and Arterial roads, where there may be a maximum of two vehicle crossings per site if each crossing is a single exit or entry (one way flow), or	Three vehicle crossings permitted – Four proposed

APPENDIX E10 TRANSPORT (RURAL VOLUME) and APPENDIX E13 TRANSPORT (TOWNSHIP VOLUME)	COMMENT
(b) The site has a road frontage of more than 100m in length where there may be a maximum of three vehicle crossings per site.	
E13.2.4.5 - The maximum spacing and width any vehicle crossing shall comply with Table E13.7.	Crossings are less than 1m or more than 7m apart (compliant) Crossing widths are between 4m and 7m (compliant).
E13.2.4.6 - For the purposes of measuring the distance between crossings specified in table E13.7, the distance between two vehicle crossings shall be measured along the edge of the carriageway parallel to the road centre line, between the full height kerb or edge of crossing seal and the full height kerb or seal edge of the adjoining crossing.	Noted
E13.2.4.7 - For the purposes of measuring crossing widths as specified in Table E13.7, the width of a vehicle crossing shall be measured at the property boundary (parallel with the road reserve).	Noted
E13.2.4.8 - Notwithstanding E13.2.4.5 above, for vehicle crossings onto a State Highway or Arterial road with a posted speed limit of 70km/h or greater the distances between crossings shall be taken from Diagram E13.4.	Access is not to a State Highway or Arterial Road
E13.2.5 Standard of Vehicle Crossings	
E13.2.5.1 - Vehicle crossings shall be constructed to the following minimum standards: (a) Standard vehicle crossings shall be provided to sites capable of containing no more than 6 dwellings or which generate no more than 100 vehicle movements per day. (b) Heavy-duty vehicle crossings shall be provided for all other sites.	Noted
E13.3 Road Standards	
E13.3.1 New Road …	N/A no new roads are proposed.
E13.3.2 Road Intersection Spacing (all roads)	N/A no intersections are proposed

Appendix 3

Delay Analysis

Table 3: Birchs Road Access Right Turn Entry Tanner Delay Analysis

Parameter	Performance
Major Stream Volume (Birchs Road) (NB: This has been based on a conservative assumption that peak hour traffic would not exceed 20% of AADT and includes turning volumes of priority movement (L-turn entry). Assumes half traffic volume is south bound (towards Lincoln).	620 vph
Minor Stream Volume (i.e. right turn volume into site) (NB: This conservatively assumes 2/3 of peak hour trips, are entering and half are making a right turn.	88
Critical Acceptance Gap*	5 seconds
Follow Up headway**	3 seconds
Average Delay	3.6 seconds (right turn)
Level of Service	A

Table 4: Birchs Road Access Right Turn Egress Tanner Delay Analysis

Parameter	Performance
Major Stream Volume (SH8) (NB: This has been based on a conservative assumption that peak hour traffic would not exceed 20% of AADT and includes turning volumes of priority movement (R-turn entry). Assumes half traffic volume is south bound (towards Lincoln).	1,108 vph
Minor Stream Volume (i.e. right turn volume into site) (NB: This conservatively assumes 2/3 of peak hour trips, are exiting and half are making a right turn[5].	88
Critical Acceptance Gap*	5 seconds
Follow Up headway**	3 seconds
Average Delay	9.2 seconds (right turn)
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.
Average delay has been determined from Figure B.3(d), Austroads, Part 5. Level of Service has been extracted from the Highway Capacity Manual which suggests delays that are less than 10 seconds represent LOS A.

[5] It is noted that even if 2/3 were turning right the delay would be 10.3 seconds and level of service B which is still considered acceptable.