ATTACHMENT [F]: Integrated Transport Assessment

Minister of Education: Notice of Requirement | Rolleston Secondary School

Rolleston Proposed High School

Integrated Transport Assessment

Ministry of Education

MINISTRY OF EDUCATION
TE TĀHUHU O TE MĀTAURANGA

Transport + Location Intelligence

Rolleston Proposed High School

Integrated Transport Assessment

Ministry of Education

Quality Assurance Information

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Prepared by: Fraser Dixon, Transport Engineer, Jared White, Principal Transportation Engineer

Reviewed by: Penny Gray, Principal Transportation Engineer

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		Name
22 October 2021	Draft	Dave Smith, Technical Director
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T +64 9 486 0898 (Akld)
T +64 3 377 4703 (Chch)
E admin@abley.com

Auckland
Level 1, 70 Shortland Street
PO Box 613
Auckland 1140
New Zealand

Christchurch
Level 1, 137 Victoria Street
PO Box 36446
Christchurch 8146
New Zealand

www.abley.com

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1. Introduction

1.1 Overview

The Ministry of Education (MoE) commissioned Abley Limited (Abley) to prepare an Integrated Transport Assessment (ITA) for educational services for a site within the Faringdon South-East development area in Rolleston. The Faringdon south subdivision is split into a west and an east site, with the original Faringdon development located centrally. The subject site is located in the east site on the southeast corner, as shown in red in **Figure 1.1**. The east site will be the subject of this assessment.

This ITA will be used to support the Notice of Requirement (NoR) for designation lodgement. The site is approximately 10.18 hectares and will cater for the establishment of a new High School which will have a masterplan roll of 2,200 students and a build roll of 1,200 students. There is a potential to expand this to 2,500 students in the future. The designation will also include provision for a primary school, an Early Childcare Educations (ECE) facility and a Hangarau specialist teaching facility. The school and ECE will cater for up to approximately 300 and 50 students respectively. Students will arrive from other schools to attend the Hangarau teaching facility.

This ITA focusses on the transport provisions required to support the NoR for the High School, primary school and ECE but includes some discussions relating to other developments where appropriate.

Figure 1.1 Location Plan

1.2 Schools Overview

As is typical for any school, some or all of the following are expected to be developed on the site.

- Buildings; including classrooms, hall, library, administration office space, staff workspace, caretakers facilities, sick bay etc
- Playing fields and hardcourts
- Vehicle accessways, parking space for staff, students and visitors, temporary drop off-pick up areas, loading bays
- Footpaths, landscaping and fencing
- Servicing; including water, sewer, stormwater, electricity, heating, telecommunications and outdoor lighting

1.3 Report Structure

This report is structured as follows:

- Site Description
- Transport Environment
- Strategic Context
- Predicted Travel Demands
- Assessment of Transport Effects
- Transportation Modelling Network Assessment
- Conclusion

2. Site Description

2.1 Locality

The proposed site is located in the Faringdon South-East subdivision, which is approximately 3km south from the Rolleston town centre. The site is located in the south-eastern corner of the site. No stages of the subdivision have been completed as of time of writing. The roading network around the school is identified within Stage 4 and Stage 5. The residential lots to the north of the site are Stage 4 and Stage 7 and the lots to the west of the site are Stage 1 and Stage 5 of the subdivision as shown in **Figure 2.1**.

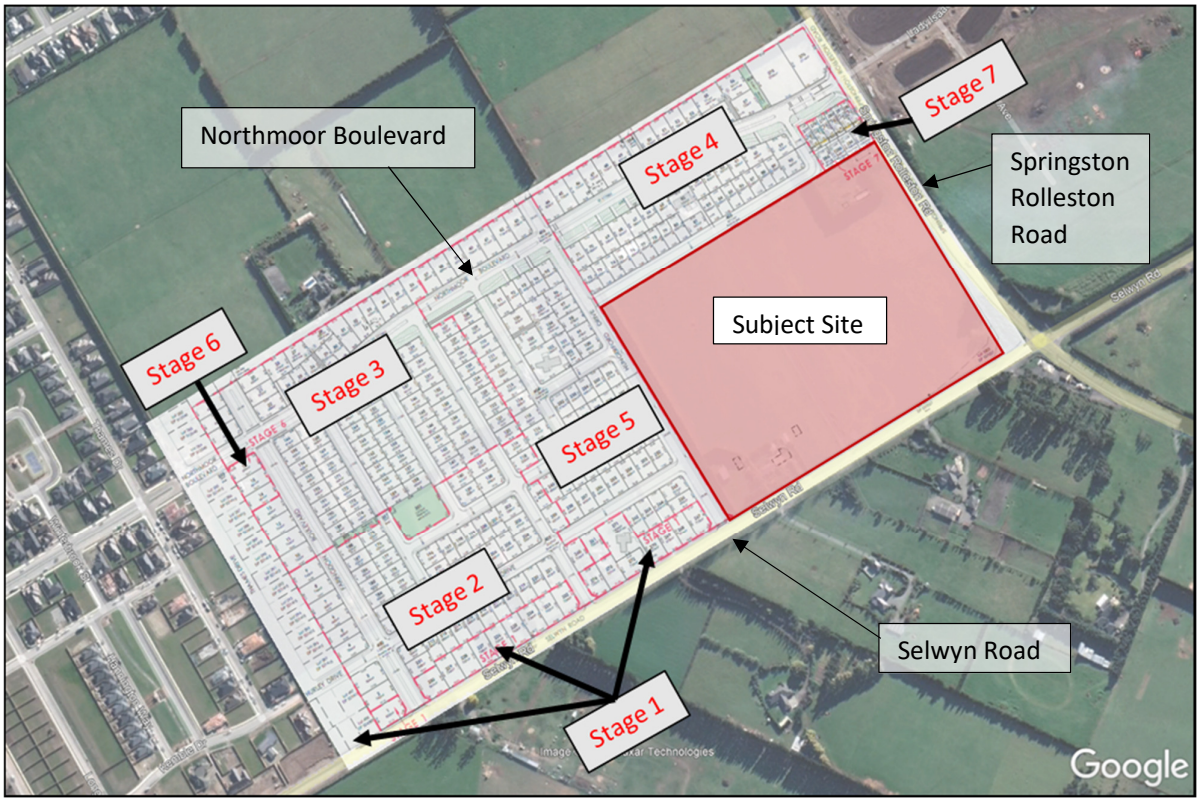

Figure 2.1 Map of subdivision stages

Selwyn Road borders the subdivision in the south and Springston Rolleston Road borders the site to the east. To the north of the site Northmoor Boulevard is proposed to be extended connecting Springston Rolleston Road and East Maddisons Road and Goulds Road.

2.2 Zoning and surrounding land use

As shown in **Figure 2.2**, according to the Selwyn District Plan the subject site is zoned Inner Plains. However, the site has an approved EPA decision as part of the Fast Track Consenting Act. The approved subdivision and land use consent references are RC215539 and RC215540.

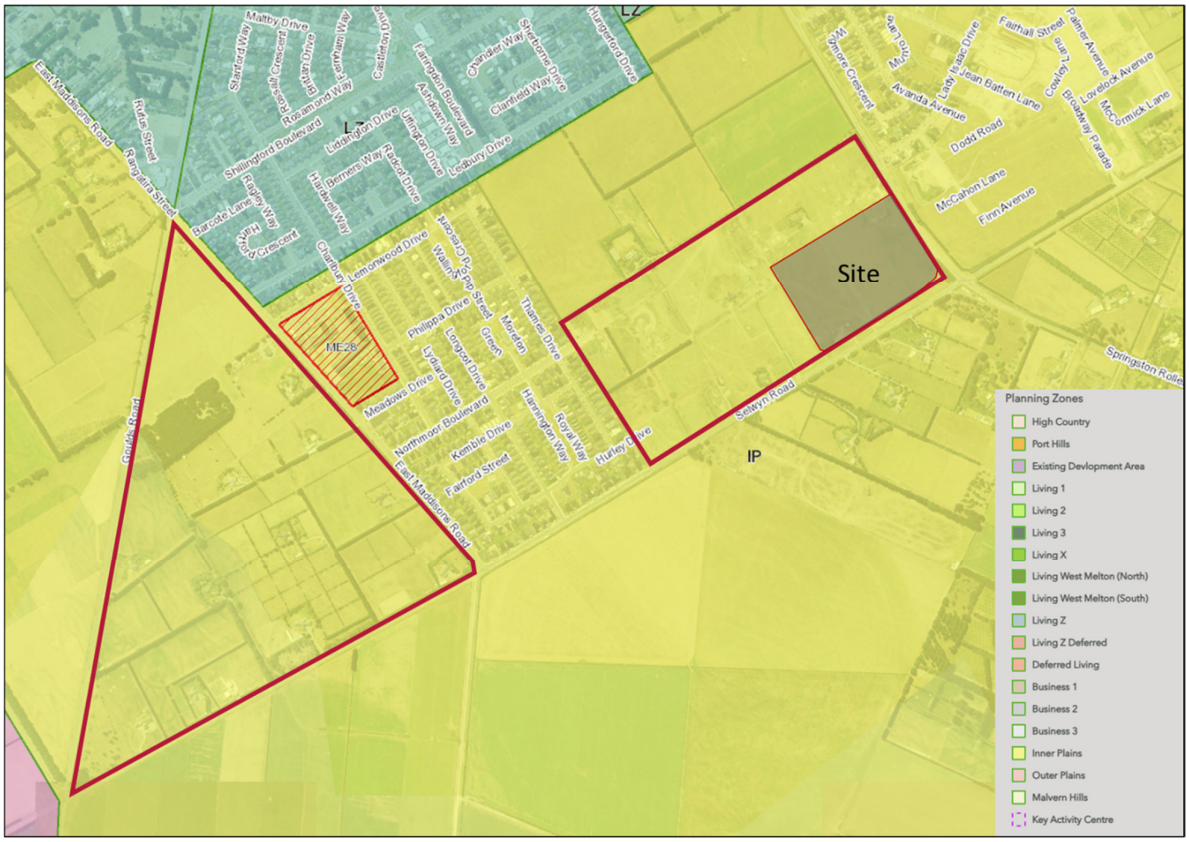

Figure 2.2 Land use zoning of the site and surrounding area

The school site encompasses an entire block of the subdivision and therefore has road frontages on all four boundaries two of which are existing (Selwyn Road and Springston Rolleston Road). Residential housing is proposed around the school to the north and west, with a section of high-density housing on the north-east corner of the school site. No development is currently proposed to the south and the Acland Park subdivision is located to the east of the site on the opposite side of Springston Rolleston Road.

2.3 Existing Site Information

As seen in **Figure 2.3**, currently the site is greenfields with existing roads on the south and east side, however we understand earthworks and land development are progressing across the site. The topography is generally flat.

Figure 2.3 Proposed site looking north from Selwyn Road

2.4 Planned Network

The existing transport network in Rolleston is constantly changing with the construction of a number of new residential developments. An indicative layout of the proposed main roads within the Rolleston Metropolitan Urban Limit is outlined in the Rolleston Structure plan dated 2009, and is shown in **Figure 2.4**.

The majority of the new roads have not yet been implemented or designed in detail. The future roads within the areas that have no approved developments, are expected to follow the indicative road network outlined in the Rolleston Structure Plan. However, similar to the already established roads, the exact road alignment and other details are expected to undergo some changes during the detailed designs of the respective subdivisions.

The key changes to the transport network with regard to the main transport corridors around the proposed school site are:

- Roundabout control is proposed at Springston Rolleston and Selwyn Road intersection identified in Selwyn DC LTP 2021-31.
- Roundabout control will be considered by SDC in the future at the Northmoor Boulevard and Springston Rolleston Road intersection. As part of the EPA decision, the developer provided a slight redesign of the lots surrounding this intersection in order to accommodate a roundabout in the future, however a roundabout is not required as part of the decision.

Figure 2.4 shows that both Selwyn Road and Springston Rolleston Road are classified as District Arterials under the CRETS road hierarchy. This suggests that both Selwyn Road and Springston Rolleston Road are planned to have similar road environments and cross sections.

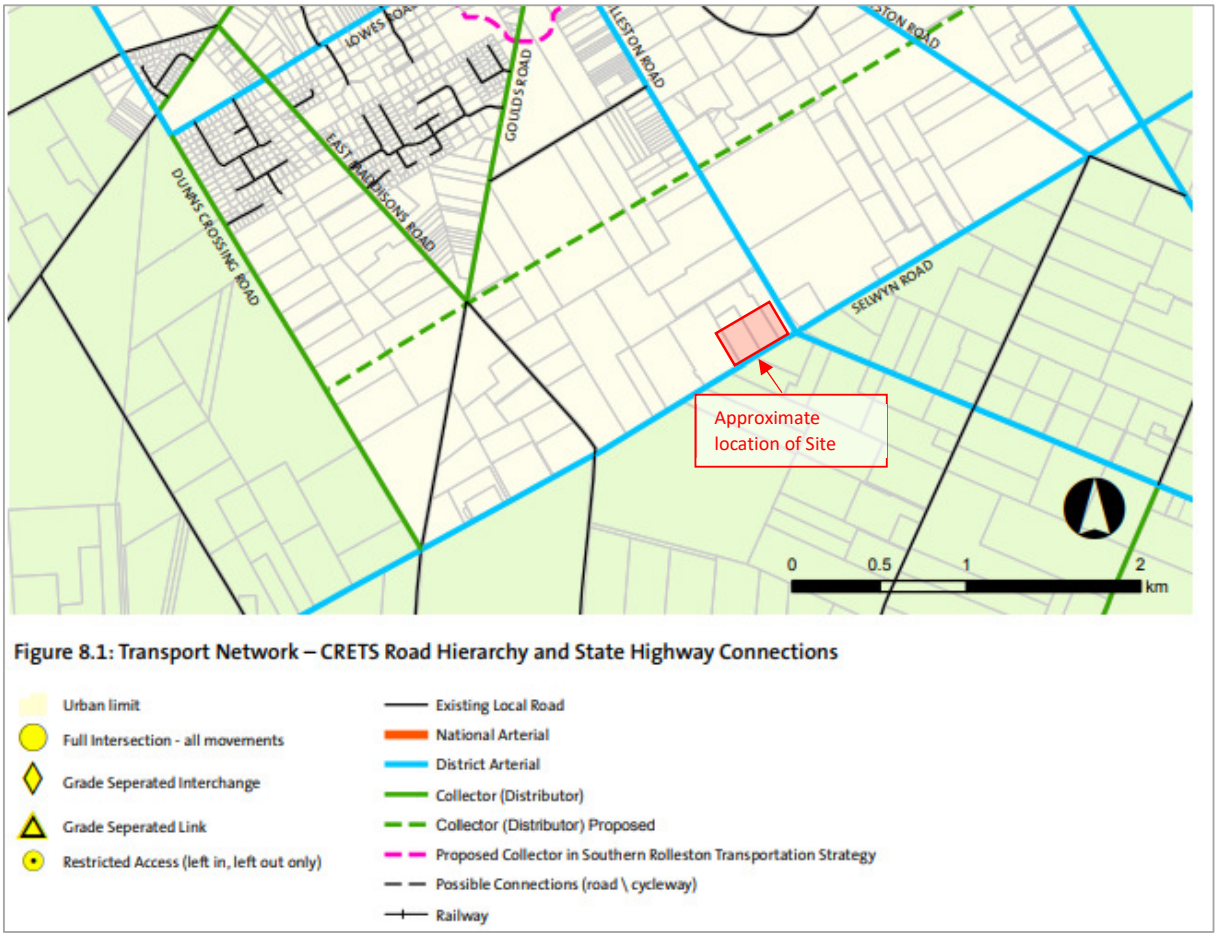

Figure 2.4 CRETS road hierarchy and state highway connections (source: Rolleston Structure Plan - Selwyn District Council)

Although there are no existing dedicated cycling facilities within the frontage, **Figure 2.5** shows that cycle routes are planned along Springston Rolleston Road and Selwyn Road. These would provide direct cycle connections to both sites from the wider Rolleston urban area. It is not clear from **Figure 2.5** what type of facility is intended.

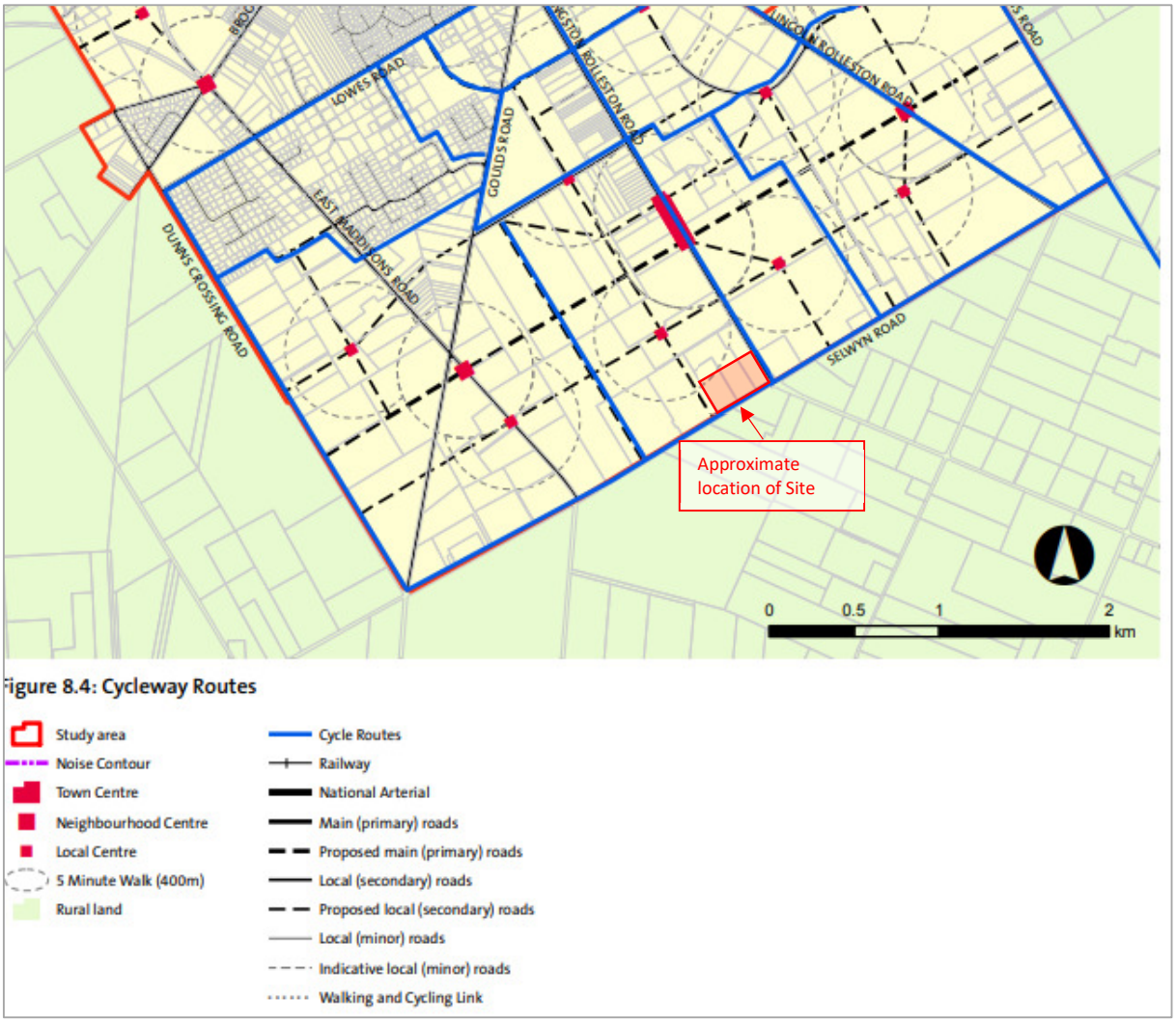

Figure 2.5 Cycleway routes

3. Transport Environment

3.1 Introduction

The proposed site is located in the Faringdon South-East subdivision, which is approximately 3km south from the Rolleston town centre. The road network within the subdivision is under construction and the proposed layout is shown in **Figure 3.1**. It is anticipated that at least the roads fronting the school and linking into the wider roading network, will be constructed by the time the school is due to open.

Springston Rolleston Road and Selwyn Road are existing roads that will likely have enhancements installed before the school opens, such as footpaths and lighting.

Figure 3.1 Roading network around the school site

At this stage no school enrolment catchment or any school site layouts plans are available. It is assumed that an off-street carpark will be provided and that the scale and details of this will be determined at the Outline Plan of Works stage. It is assumed that there will be some form of pick up and drop off facility provided on site however it is expected that some pick up and drop off will occur on the frontage roads even if a facility is provided.

The following section describes the existing and the proposed road network which includes frontage roads, walking and cycling networks and facilities and public transport services and facilities.

3.2 Surrounding Road Network

The surrounding road network in Rolleston is constantly evolving with the large amount of ongoing development. There are two existing roads that the site has frontage to: Selwyn Road and Springston Rolleston Road. There is also a number of planned roads that are under construction that will either provide a frontage to the school or will provide access to the school site, see **Figure 3.2**.

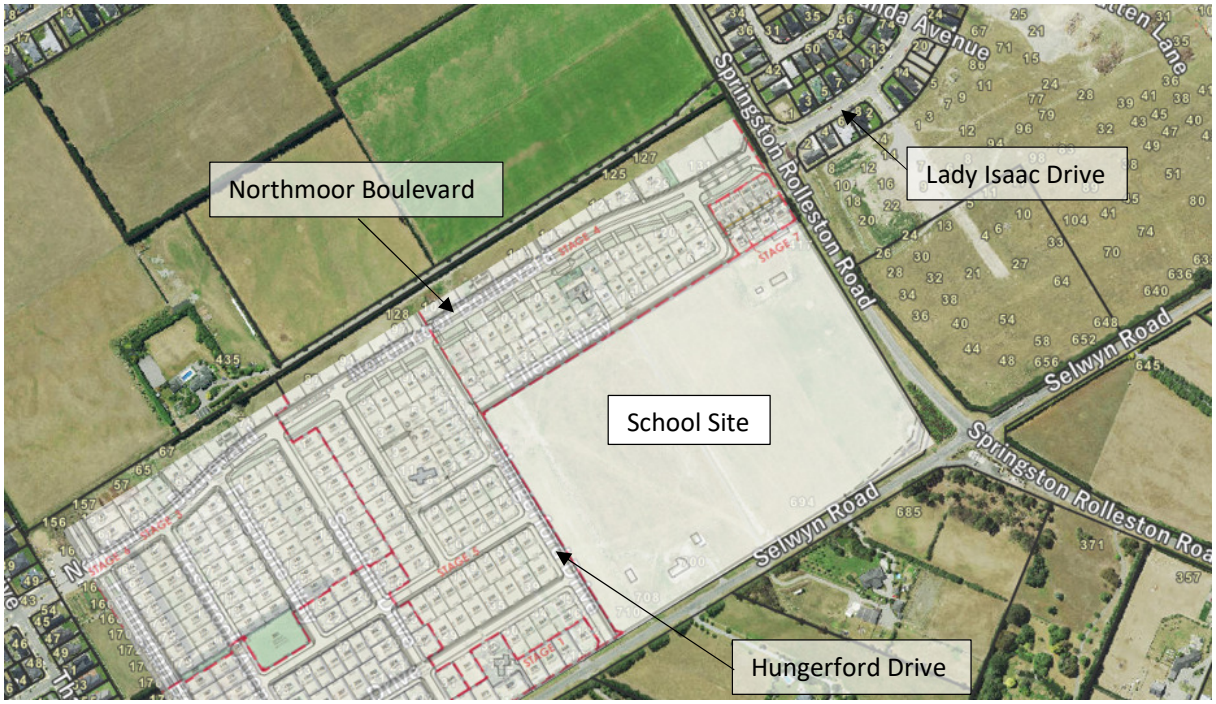

Figure 3.2 Roading layout surrounding the school site

Springston Rolleston Road

The Selwyn District Plan classifies Springston Rolleston Road as an Arterial. Springston Rolleston Road forms a key part of the roading network, connecting Rolleston town centre to Lincoln town centre. It runs between Lowes Road in the north and Shands Road in the south.

The speed limit on Springston Rolleston Road at this location has recently changed to 60km/h. This change is consistent with the development along this road and reflects the more residential area of this road. The speed limit changes to 100km/h just south of the Selwyn Road intersection.

Springston Rolleston Road along the frontage of the site presents like a rural road with no footpaths, no dedicated on-road cycle facilities, no kerb and channel, no lighting and wide grass berms on both sides as shown in **Figure 3.3**. A shared path has been partially constructed from Dynes Road to approximately 90m past Lady Isaac Drive, see **Figure 3.4**.

Figure 3.3 Springston Rolleston Road looking north

It is anticipated that when the Farringdon southeast subdivision is completed the cross section of Springston Rolleston Road will change to include an extension of the 2.3m wide shared path provided on the eastern side of Springston Rolleston Road. It is also anticipated that the street lighting will continue along the road.

Figure 3.4 Springston Rolleston Road looking south

In October 2020, the average weekday traffic volume on Springston Rolleston Road between Dynes Road and Selwyn Road was approximately 4,900 vehicles

Selwyn Road

Selwyn Road has frontage along the southern side of the site and is classified as a local road under the Selwyn District Plan and a secondary collector under the Waka Kotahi One Network Road Classification (ONRC). Like Springston Rolleston Road, Selwyn Road at this location presents like a rural road with no footpaths and no dedicated on-road cycle facilities, no lighting and wide grass berms, see **Figure 3.5**. The speed limit on Selwyn Road has recently changed to 60km/h at this location, which is consistent with the 60km/h speed limit outside of the constructed Faringdon subdivision.

Figure 3.5 Selwyn Road looking east from the site

A 2.3m wide shared path on the northern side has been constructed as part of the constructed Faringdon Subdivision, from East Maddison Road intersection for approximately 460m towards the site, see **Figure 3.6**. It is anticipated that this will continue to the new site. It is also anticipated that the lighting on this side would continue.

Figure 3.6 Selwyn Road at the existing Faringdon subdivision

In August 2018, the average weekday traffic volume on Selwyn Road between Springston Rolleston Road and Longcot Drive (Site 2) was approximately 2,300 vehicles.

Adjacent new roads

To the north and west of the site there is a new proposed roading network, as shown in **Figure 3.7**. Northmoor Boulevard is anticipated to become a Collector road and links Springston Rolleston Road to East Maddisons and Goulds Road. This road does not border the side but will be a key access road into the school site for active modes and road users. Hungerford Road is to the west of the site is anticipated to provide access into the school. Road 1, along the north frontage, is a local road that will provide access to the residential lots, see **Figure 3.7**. It is anticipated that all roads will be subject to a 50km/h speed limit, including Springston Rolleston Road and Selwyn Road adjacent to the school site. SDC are also supportive of school speed zones and the Setting of Speed Limits Rule 2022 requires SDC to set a 30km/h school speed zone for schools on their roading network.

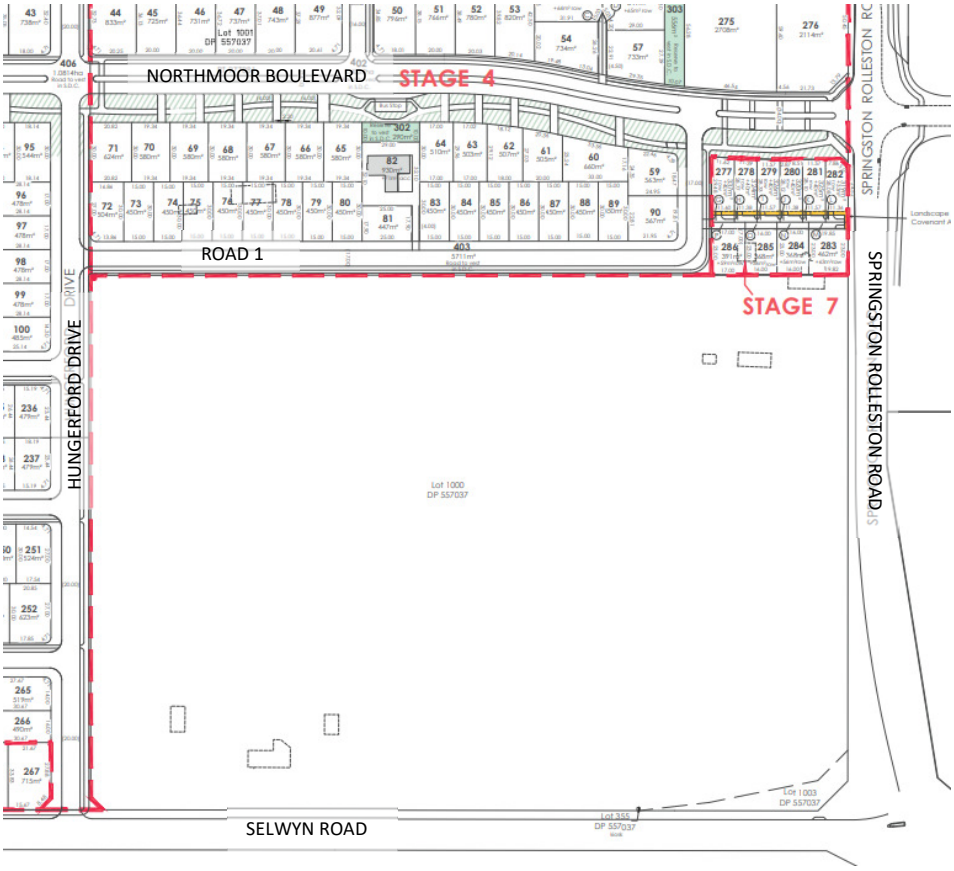

Figure 3.7 Proposed roading layout

Northmoor Boulevard is proposed to be a median divided road. As shown in **Figure 3.8**, it is proposed to have a 6.0m wide carriageway on each side of the road with a 3.0m wide median island in the middle. There will be 2.5m wide footpaths on both sides of the road which will provide a good level of service for pedestrians and cyclists. It is proposed to have a number of pedestrian crossing points along Northmoor Boulevard to facilitate good pedestrian permeability. A 6.0m wide carriageway will allow parking on both sides and at the intersection with Springston Rolleston Road, two lanes can be provided for left and right turning traffic.

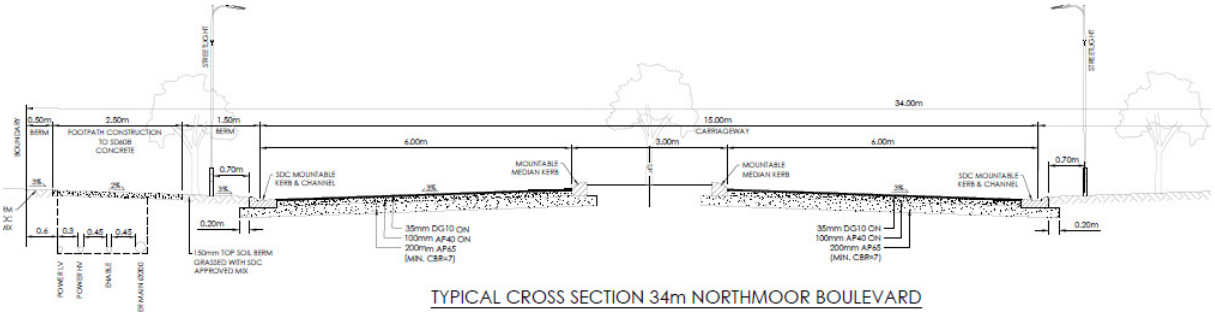

Figure 3.8 Northmoor Boulevard cross section

Hungerford Drive is proposed to have a carriageway of 9.2m which allows for 4.6m lanes in each direction, see **Figure 3.9**. Parking (2.0m wide) can be accommodated on both sides of the road and still allow two-way traffic flow with the remaining carriageway being 5.2m wide. This is also a good width for pedestrians and buildouts could be considered in the future near the school to facilitate a pedestrian crossing.

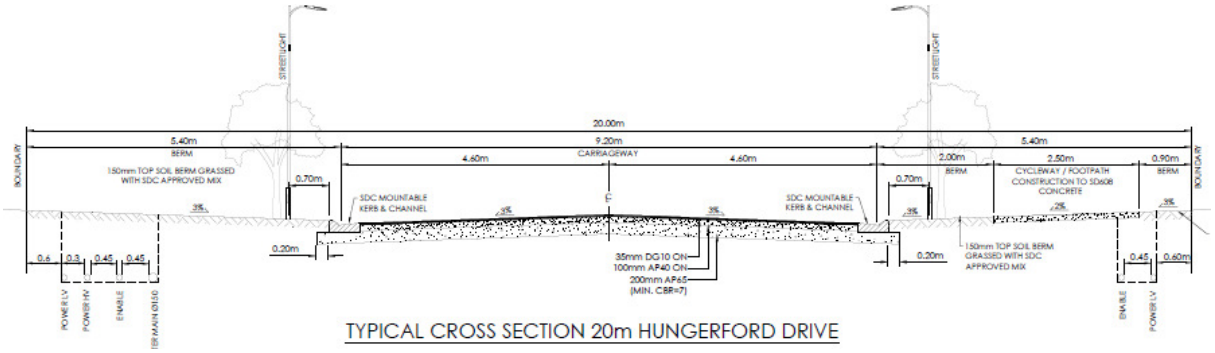

Figure 3.9 Hungerford Drive cross section

Road 1 has a carriageway width of 8.0m, see **Figure 3.10**. When cars are parked on both sides of the road then that will reduce the traffic flow down to one-way. On the south side of Road 1 is the school and on the north side are residential lots. These residential lots are accessed from Road 1 and it is anticipated that the driveways for these properties will create a staggered parking layout along this road. The driveways will allow for passing to occur.

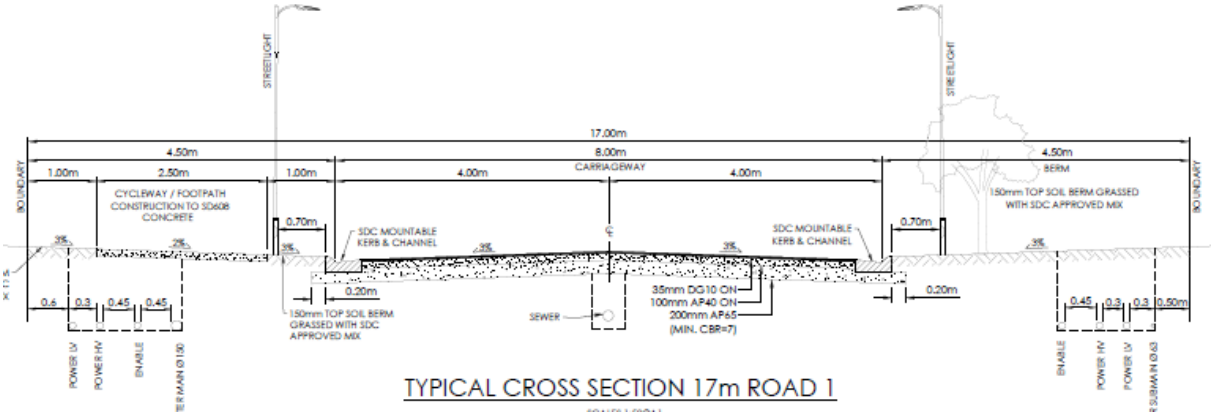

Figure 3.10 Road 1 cross section

3.3 Key intersections

Northmoor Boulevard / Springston Rolleston Road / Lady Isaac Drive

Northmoor Boulevard and Springston Rolleston Road will be a priority four way cross roads intersection, see **Figure 3.11**. Springston Rolleston Road will have priority over the other two roads. Northmoor Boulevard has enough space to allow for a left and right turning lane at this intersection and it is assumed that this will be marked. Lady Isaac Drive has a short length of dual turning and then converts to a single turning lane. It is assumed that there will be dedicated right turning bays on Springston Rolleston Road to allow for safe turning into the side roads. It is unclear where the pedestrian crossing facilities will be for pedestrians to cross Springston Rolleston Road but they will likely be offset from the intersection to allow for the turning bays. The lots surrounding this intersection have been designed to allow for a roundabout in the future but presently this is not planned to be installed.

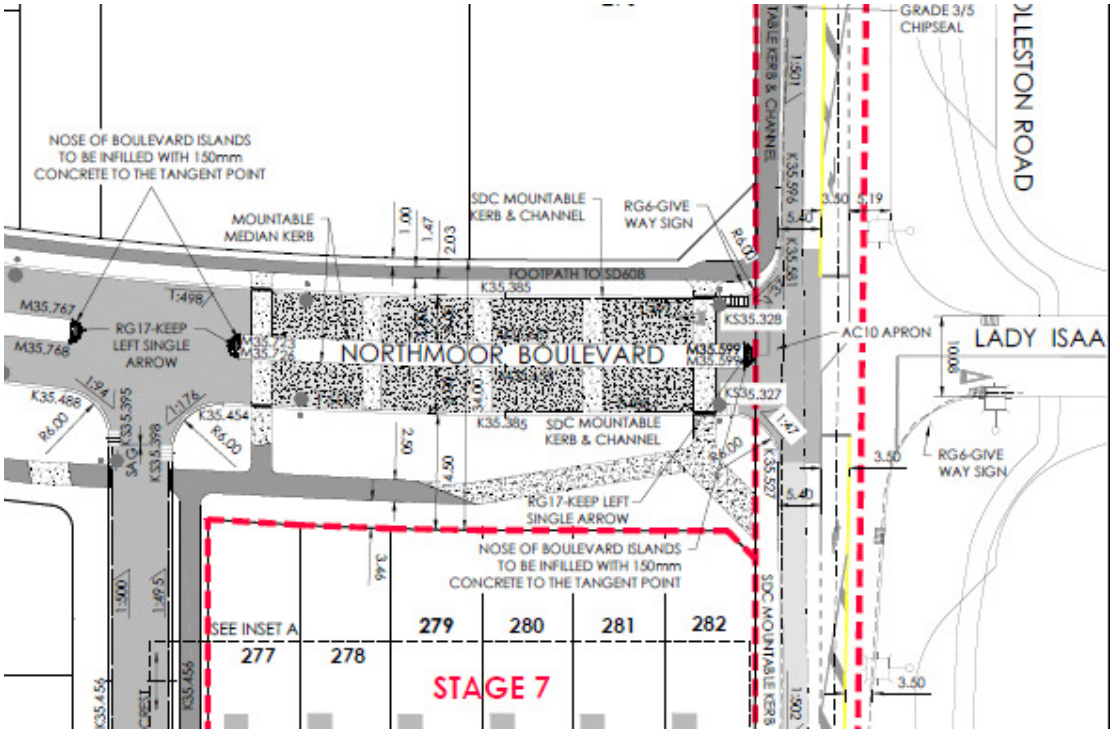

Figure 3.11 Northmoor Boulevard / Springston Rolleston Road / Lady Isaac Drive Intersection layout

Northmoor Boulevard / Hungerford Drive

Northmoor Boulevard and Hungerford Drive will be a priority T-intersection with Northmoor Boulevard having priority. It is assumed that there are single turning lanes on both roads and pedestrian facilities at the intersection, see **Figure 3.12**.

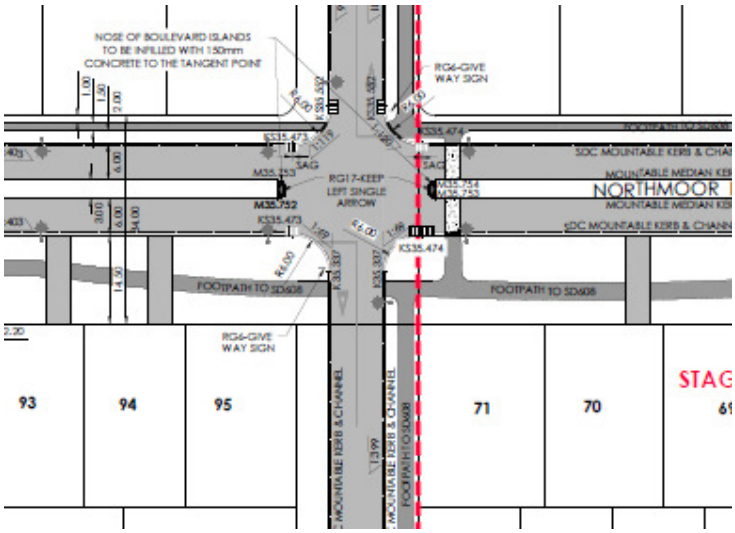

Figure 3.12 Hungerford Drive / Northmoor Boulevard intersection

Hungerford Drive / Selwyn Road

Selwyn Road and Hungerford Drive will be a priority T-intersection with Selwyn Road having priority. It is assumed that there are single turning lanes on both roads and pedestrian facilities on the northern side of the intersection.

Springston Rolleston Road / Selwyn Road

The intersection of Springston Rolleston Road with Selwyn Road is currently a priority controlled four-way crossroads intersection, see **Figure 3.13**. Springston Rolleston Road has priority over Selwyn Road. This existing layout is not conducive to a safe system intersection and has a poor safety record.

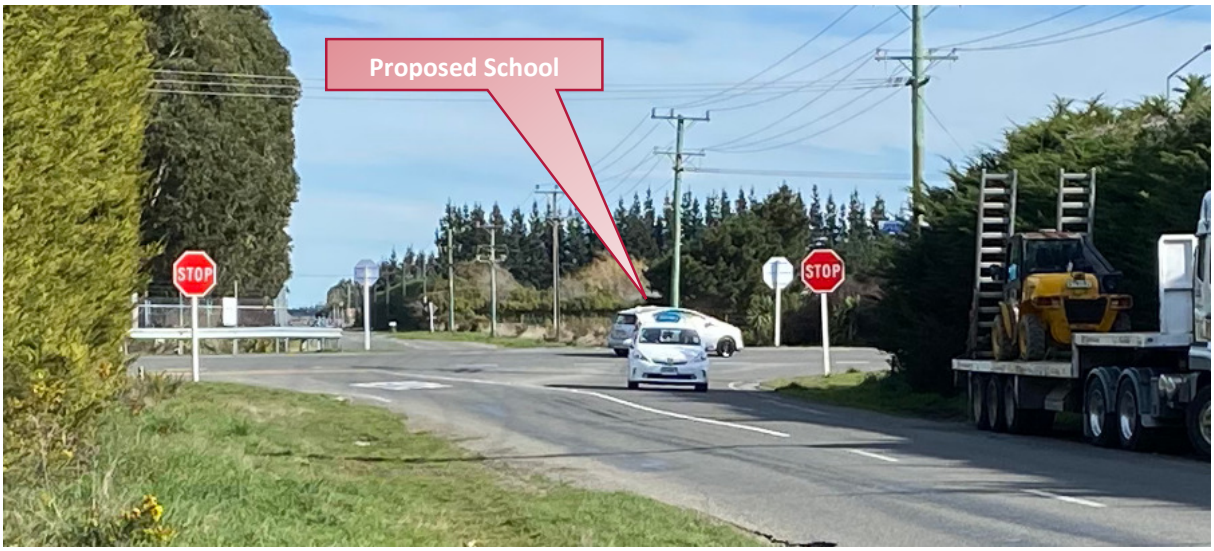

Figure 3.13 Springston Rolleston Road and Selwyn Road intersection looking west on Selwyn Road

According to the documentation attached to the EPA decision, we understand that Selwyn District Council are proposing to upgrade this intersection to a roundabout before 2028. This is also consistent with the base Paramics model for Selwyn District Council which assumes a roundabout at this intersection in 2028. The funding for this roundabout is a condition on the EPA decision that the developer will enter into an agreement with the SDC to proportionally fund the agreed costs of the roundabout. The school site was previously 161 lots and based on 10 trips per household per day this is approximately 1,610 trips per day or 11,270 per week. The trips to the school will be a higher concentration during the school start and finish times but overall, given the lower amount of trips occurring outside of school hours and in the weekends, the school is not anticipated to significantly increase trips at this intersection.

A roundabout as a traffic control device is one of the safest forms of intersection for motor vehicle users compared with traffic signals or stop and give way signs. From a safe system perspective, roundabouts reduce the severity of impacts through:

- Entry and circulating speeds of traffic are moderated by horizontal deflections
- Impact angles in adjacent-direction crashes are lower than at other intersection forms
- the relative simplicity of decision-making at the point of entry
- The reduction in the number of conflict points
- An expectation that entering drivers may have to stop to give way to vehicles within the roundabout may also contribute to lower speeds and increased driver's alertness

It is anticipated that the proposed roundabout at the intersection of Springston Rolleston Road and Selwyn Road will be a well-designed roundabout with appropriate entry and exit angles to control speed and have appropriate pedestrian facilities to allow people to safely cross Springston Rolleston Road.

3.4 Walking and cycling facilities

Introduction

The surrounding environment should be conducive to good transport connectivity. When designing for walking, scooting and cycling the following key components need to be considered:

- **Desire lines –** children who travel by active modes are likely to follow their desire line. Crossing points and paths should be located on desire lines so that they are used. Desire lines can also assist with understanding where the pinch points, warranting detailed attention, will be.
- **Interactions with Other Modes –**The layout of a site needs to be designed so that interactions between children walking, scooting or cycling to school and motor vehicles are minimised. Crossing points and paths also need to be located so that no hazards are introduced along the route.
- **Path and Crossing Design –** Both within the site and outside the school gates, paths need to have the capacity to accommodate the expected flows and mix of uses.

It is anticipated that there will be many pedestrians in the area, with the majority travelling to and from the Faringdon subdivisions and the surrounding subdivisions of Acland Park and Falcons Landing. Therefore, it is important that a continuous walking and cycling connection is made between these subdivisions and the school site. The median island on Northmoor Boulevard should have key pedestrian crossing points to assist people crossing the road. Any surrounding intersections should also have pedestrian crossing points on desire lines to encourage active travel to the school site. It is anticipated that there is a continuous footpath network on the adjacent roads around the school, except on Springston Rolleston Road where the footpath network is on the opposite side of the road.

It is recognised that in the future, further development may occur south of the school and will also require safe and appropriate pedestrian facilities.

Existing

There are no existing footpaths, cycle lanes or shared paths at the site or along the site frontage. However, some of the walking and cycling network surrounding the site has been completed.

There are partially completed shared paths along Selwyn Road and Springston-Rolleston Road as part of the existing Faringdon and Acland Pak subdivisions. It is expected that these paths will continue to the school site. The shared path on Springston Rolleston Road is on the opposite side to the school and a pedestrian crossing facility would be required to provide access across Springston Rolleston Road. The path on Selwyn Road is on the school side and can provide direct access into the school. The wider pedestrian network within the proposed and existing Faringdon subdivision and the surrounding subdivisions provides good connectivity for walking and cycling access to the school.

3.5 Public Transport

Route 820 which links Lincoln to Burnham via Rolleston is the only public bus route that currently services within 1km of the proposed site and passes the site frontage. Buses operate between approximately 6am and 9pm from Burnham to Lincoln and 7am to 9pm in the reverse direction with the headways being approximately 60 minutes in both directions throughout the week. The closest bus stop to the site is located on Lady Isaac Drive, immediately opposite Jean Batten Lane. The bus route and the bus stops in the proximity of the site is shown in **Figure 3.14**.

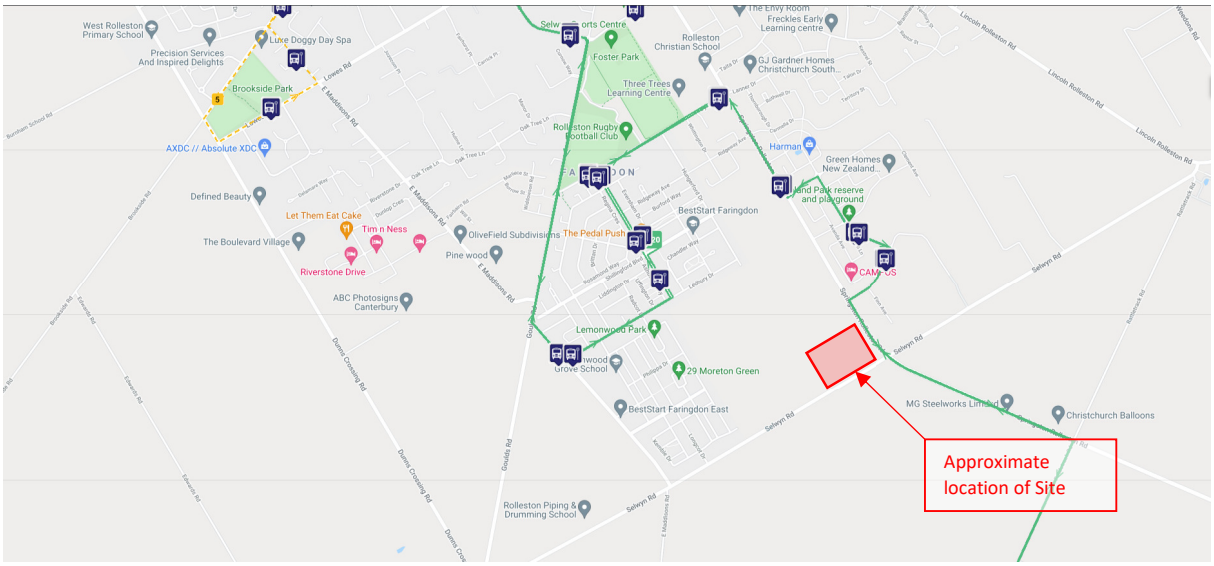

Figure 3.14 Bus Route 820

3.6 Road Safety

In order to understand the existing safety performance of the road network in the vicinity of the site, crashes that were recorded within the last five years (2016 – 2021 inclusive) were obtained through the NZTA Crash Analysis System (CAS) database. The extent of the crash search area is shown in **Figure 3.15**.

A total of sixteen crashes were recorded, of which ten were non-injury crashes. Four were minor injury crashes, one was a serious injury crash and one was a fatal injury crash. The serious injury crashes and the fatal crash were a result of a vehicle not correctly giving way or stopping at the Springston Rolleston Road and Selwyn Road intersection. Ten of the sixteen recorded crashes were located at the Springston-Rolleston Road and Selwyn Road intersection where the school site will be located including the serious and fatal injury crashes.

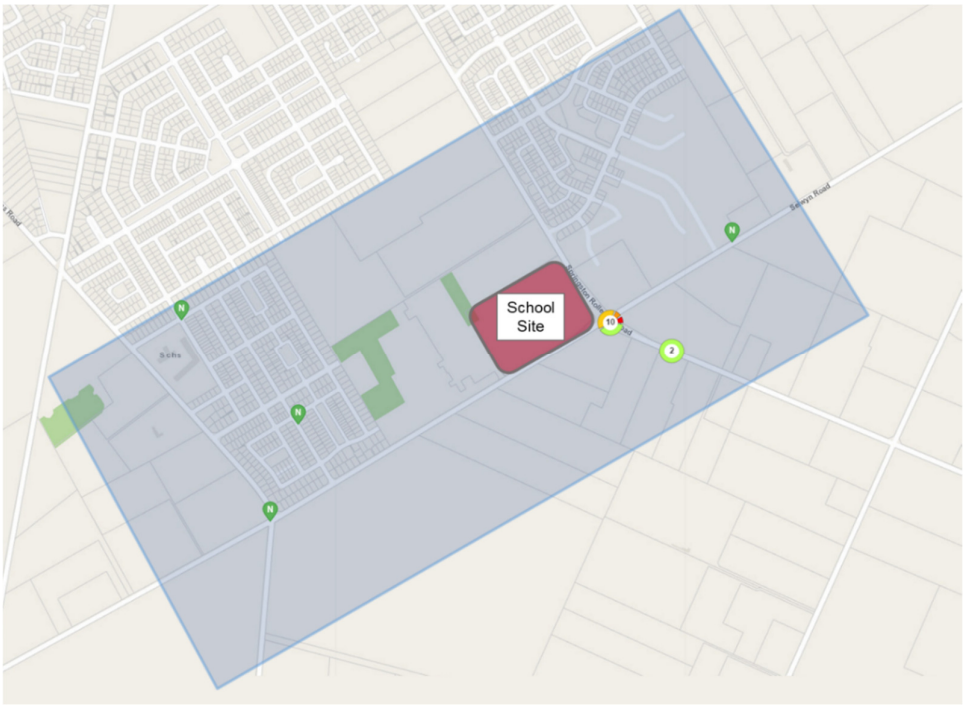

Figure 3.15 Crash search area

The intersection of Springston Rolleston Road and Selwyn Road is a high speed four-way crossroads intersection with Stop controls against Selwyn Road. Given the design of this intersection and the associated speed and volume of traffic through this intersection it is not unexpected that there is a safety concern here. As discussed previously, this intersection is identified in the Selwyn District LTP 2021-31 and is proposed to be upgraded to a roundabout which is considered one of the safest forms of intersection control compared with traffic signals or stop and give way signs in this context.

It is noted that the roading network to the north and west of the site has not been constructed and hence the crash history is not entirely representative of the road safety performance in the immediate vicinity of the proposed school location. However, the proposed roads will be within a residential environment and designed with low speeds which is supported by the crash history within the constructed section of Faringdon. On this basis it is unlikely that the future roading network surrounding the site will have any notable underlying safety concerns which would make developing the school unviable at the proposed location.

4. Strategic Context

4.1 Relevant strategies and policies

Figure 4.1 shows the relevant regional and local plans need to be considered from a transport perspective to ensure consistency with outcomes.

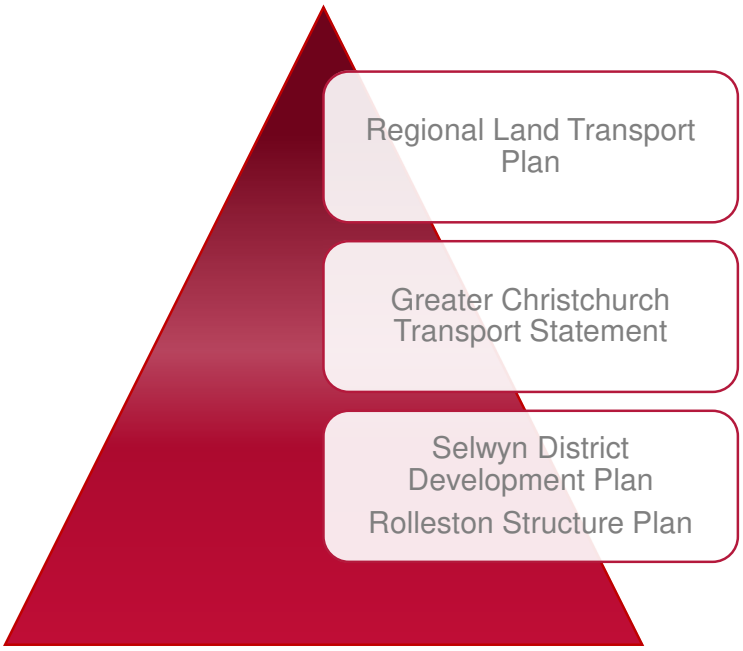

Figure 4.1 Regional and local strategies/plans

From the review of the strategies and plans the following transport aspects need to be considered in the development of the site for use as a school.

Accessibility – The school site needs to have a high level of accessibility by all modes to support travel choice. This means that access by bus, either school bus or public transport is well catered for, and that walking and cycling are provided for through a site that is well connected with the surrounding transport network.

Safety – Access to the school is developed with safety as key criteria. This means measures such as suitable road crossings, access to the bus bays without crossing roads and sufficiently wide shared paths

Efficiency – The traffic generated by the site should not have an unacceptable adverse impact on the surrounding road network in terms of travel time.

These matters are addressed in the Assessment of Effects **section 6** of this report.

5. Predicted Travel Demands

The Hangarau specialist hub will operate outside of the school start and finish times. For example, if school starts at 8.45am the visiting students will arrive at 9am. On that basis the trip generation of this part of the school will not coincide with the general traffic morning (AM) and afternoon (PM) peak periods.

5.1 Vehicle Trip Generation

The assessment assumes the Masterplan roll of 2,200 students although as noted in the following section the transport effects are tested at a higher high school roll of 2,500 pupils as a growth test. The Waka Kotahi School Travel Model (developed from New Zealand Household Travel Survey (NZHTS) data as part of Waka Kotahi Research report 453) was used to estimate the likely modal split of a Canterbury all ages school. The 'all ages' school information was used from the model as the sample size for the high school information was insufficient and not recommended to be used. In the model the NZHTS data has been arranged in a manner that enables a first-cut estimate of likely trip generation of schools depending on region within the New Zealand and school size. **Table 5.1** shows the estimated number of trips by each mode and total number of trips by private motor vehicle.

The model estimates that 49.7% of school trips will be made by private motor vehicle and the remainder by either walking, cycling or public transport. Although the estimated cycle trips are low it is best to consider walking and cycling together as an overall active mode and would include the use of e-scooters. The 5.4% vehicular driver proportion reflects that some Year 13 students will drive to school. The existing Rolleston College has three school buses, two from West Melton and one from Weedons. It is anticipated that this school is likely to have a similar amount of school buses as well and this would likely reduce vehicle passenger and driver usage.

Table 5.1 Projected Trip Generation – 2,200 student roll

Mode	Walk	Cycle	Public Transport	Vehicular Passenger	Vehicular Driver
Share (%)	33.7%	7.7%	7.6%	44.3%	5.4%
All day student vehicle trips				1,041	156
All day staff and service vehicle trips				110	
Morning (AM) peak hour private motor vehicles (8-9am)				903	
Afternoon (PM) peak hour private motor vehicles (3-4pm)				691	

The school roll is assumed to be 300 students. The School Travel Model was used to estimate the likely modal split of a Canterbury primary school.

The model estimates that 67.7% of school trips will be made by private motor vehicle and the remainder by either walking, cycling or public transport. Again, walking and cycling should be considered together as an overall active mode and would include the use of e-scooters.

The surrounding environment will influence the mode split, the model cannot take this into account. For example, over time the road network will become more connected in this area and facilitate better walking and cycling accessibility, but in the short term the proportion of walking and cycling may be lower.

Table 5.2 Proposed Trip Generation - 300 student roll

Mode	Walk	Cycle	Public Transport	Vehicular Passenger	Vehicular Driver
Share (%)	25.1%	1.9%	4.3%	67.7%	0%
All day student vehicle trips				210	
All day staff and service vehicle trips				16	
AM peak hour private motor vehicles (8-9am)				164	
PM peak hour private motor vehicles (3-4pm)				148	

The morning (AM) peak is considered the worst-case scenario for assessing the network effects of traffic generation of a school as it coincides with the commuter peak traffic flow. A 2,200 student high school generates 903 trips on the network in the AM peak and the 300 student school generates 164 trips on the network in the AM peak.

As mentioned above, the trips to the Hangarau specialist hub will be outside of the AM and PM peaks. Students from outside schools using the hub will arrive on chartered school buses at set times. The total number of bus movements per day is not known. However, it is not considered that the trips generated by these buses will affect the network as they will be travelling outside of general peak traffic hours.

An Early Childhood Education (ECE) facility is also proposed at the school site. This will cater for a maximum of 50 students. NZTA Research Report 453 ('Trips and Parking Related to Lane Use) estimates peak hour trip rates, with 1.4 vehicle movements per child and 4.1/child for the daily trip rate. Therefore for 50 students, 70 vehicle movements can be expected in the peak hour and 205 vehicle movements per day, see **Table 5.3**.

Table 5.3 Preschool (ECE) trip rates

Land Use	Pupils	Daily	Peak hour
Preschools	50	205	70

These trips are not all considered to be new trips on the network. Some will be existing trips on the network that will pass by or divert to visit the school site. The AM peak for the ECE will not necessarily coincide with the high school and school AM peak as generally ECE's operate outside of school times. There is also likely to be crossover trips where children are dropped off at both the school and ECE by the same parent.

Table 5.4 School Site Trip summary table

	Daily (vpd)	Peak Hour
Preschool	205	70
School	226	164
High School	1,307	903
Total	**1,738**	**1,137**

Both Springston Rolleston Road and Selwyn Road are planned to be District Arterials in the future. This indicates that they will be anticipated to cater for higher volumes of traffic than lower classification roads and the proposed trip generation of the high school will likely be able to be accommodated on these roads. However, the extra trips associated with both scenarios could affect intersection capacity and safety. This will be discussed in **Section 6.5**.

6. Assessment of transport effects

The NoR has been lodged in advance of construction of the High School, primary school and ECE, with the Ministry requiring certainty as to the designation prior to progressing detailed master planning and design. There is therefore inherent uncertainty, which is reflected in the assumptions this report makes and the high level nature of the assessment undertaken. It is therefore recommended a detailed Integrated Transport Assessment (ITA) is prepared at the Outline Plan stage, when the land use and transport environment information are better known and there is increased certainty. To cover off some of this uncertainty, in the transport modelling analysis there is a sensitivity test of an increased High School roll of 2500 pupils. Given the current levels of growth in Rolleston and recently proposed Plan Changes nearby realistically the roll could increase to its maximum in a shorter time period.

6.1 Access and movement overview

Access Function

Travel modes associated with the school includes private vehicle, public transport by bus, walking and cycling. Accesses to the site will be designed to cater for all these modes of transport. Provision for bus parking on the site will likely be required in some form.

The site will have servicing requirements such as waste collection and goods deliveries. Typically, these activities require heavy vehicles in order to carry out the required service. Accordingly, access points should be designed to accommodate the largest expected service vehicle.

Another important function of accesses is to provide for emergency vehicles such as fire engines and ambulances. All accesses and the internal school movement network should be designed to accommodate emergency vehicles.

Access safety

Appropriate sight distance between drivers exiting the site and approaching drivers on the frontage road should be provided at all accessways. The Austroads Guide to Road Design Part 4A provides the types of sight distance to consider when designing intersections. These include safe intersection sight distance (SISD)[1], approach sight distance (ASD)[2] and minimum gap sight distance (MGSD)[3]. A minimum of 97m SISD, 55m ASD and 69m of left turn MGSD are required for a 50km/h design speed. SISD is considered the minimum sight distance requirement that must be satisfied.

This should be assessed during the Outline Plan of Works stage when the design of the school accesses is confirmed.

6.2 Walking and cycling provision

It is anticipated that there will be some students walking, cycling and scootering to the school, especially in the warmer, drier months. The layout of the school site will need to ensure pedestrian and cyclist movements are well catered for.

In order to minimise conflicts between vehicles and pedestrian/cyclists movements, the vehicle access points should include separate paths. Careful treatment of entry and exit to the shared paths from the road network will be required during the Outline Plan of Works stage.

The proposed road designs can cater for students walking and cycling to the school. There is an existing shared path network in the vicinity of the school, however it does not extend to the school site. It is highly recommended to link the existing shared path networks on Selwyn Road (school side) and Springston Rolleston Road (opposite side) to the school site. This will create a good connection for school aged children to cycle to school. The proposed road and intersection designs need to ensure that pedestrians and cyclists can easily and safely access the school at this site.

[1] Distance for a driver on a major road to observe a vehicle on a minor approach moving into a collision situation and to decelerate to a stop before reaching the collision point.

[2] sight distance on minor road approaches to all intersections to ensure that drivers are aware of the presence of an intersection

[3] distance corresponding to the critical acceptance gap that drivers are prepared to accept when undertaking a turning manoeuvre at intersections.

The new Land Transport Rule Setting of Speed Limits 2022 requires SDC to set a 30km/h school speed zone around schools on their roads. This sets a safe and appropriate speed for active modes like cycling and walking and would be recommended on Selwyn Road, Springston Rolleston Road, Hungerford Drive, Road 1 and Northmoor Boulevard. In conjunction with reduced speeds, raised safety platforms are increasingly being used in New Zealand to improve safety through intersections and crossings by controlling speeds. The roundabout design at Selwyn / Springston Rolleston intersection needs to consider safe and appropriate pedestrian crossing points, such as raised platforms. This will assist school students to safely cross this road. This is also relevant outside of school hours as this crossing is anticipated to be used by a number of cyclists and pedestrians due to its location on the shared path network.

Springston Rolleston Road also has a pedestrian refuge island installed north of the Lady Isaac Drive / Springston Rolleston Road intersection. This island links in with the Acland Park footpath and shared path network. This is a wide pedestrian refuge island that is suitable for large groups of students or people on cycles. It would be recommended to ensure that any school speed zone along the section of road covers this pedestrian refuge island.

When the primary school is operational, it is likely that a formal pedestrian crossing point, such as a kea crossing, will be required. The details around the location of pedestrian crossing points will be finalised in the Outline Plan of Works stage, once the school layout is confirmed. However, it is anticipated that this crossing point will occur on Hungerford Road as this will provide for the pedestrian demand from the west. It would not be appropriate to have a kea crossing on Springston Rolleston Road. The volumes of traffic on this road are too high and it would be difficult for children to communicate with each other to provide a safe crossing point.

6.3 School bus provisions

It is anticipated that the proposed school will operate school buses daily to the school. The existing Rolleston College has three school buses, and it is anticipated that this new high school will have a similar amount. It is also anticipated that students from outside schools using the Hangarau specialist hub will arrive on chartered school buses at set times. The total number of bus movements per day is not known at this time.

Within the school design there should be provision for bus parking within the school site with the capability to expand based on the future roll size. The road that will provide access to the buses needs to be able to accommodate heavy vehicles. The most appropriate road to provide access to the bus parking is Selwyn Road. The details around the provision for bus parking will be determined at the Outline Plan of Works stage when the school design has been confirmed.

6.4 Parking and servicing

Service vehicles requiring access to the school include waste collection trucks, delivery vehicles and mobile health vehicles. Any service accesses should be designed in accordance with the service vehicles likely to use the accesses.

The site may also provide parking areas for staff and drop-off areas for students. The details of the parking design are not addressed in this ITA, this will need to be addressed in the Outline Plan of Works stage following designation. Areas of cycle parking for staff and students should also be provided. However, it is noted that the site is large enough to accommodate an appropriately sized car park with the possibility for the provision of drop off facilities.

The school is located on the edge of the Rolleston Township within the Faringdon south-east subdivision. Appropriate connections for pedestrians/scooters and some cycle connections to and from the school are proposed to be provided by the existing and future Faringdon subdivision and into the Acland Park subdivision. These connections will encourage and facilitate active travel. Providing appropriate active travel connections as well as school travel planning, will assist in reducing the number of students and staff travelling to school by car and therefore needing a car park.

The school site is located so there is the potential for car parking and servicing to be provided on two of the frontage roads. The school site is flat and rectangular and appropriate car parking can be facilitated on site for staff and students. It is anticipated that on-street car parking will be limited to some drop-off and pick up by parents and caregivers.

6.5 School Access

The proposed school site is located with four frontage roads. Access to the site can be catered for on all the road frontages. However, the main entrances to the school which will cater for the largest traffic volumes would be recommended to be on Selwyn Road or Hungerford Road. These roads have lower volumes of traffic than Springston Rolleston Road and the width of the roads is conducive to creating a safe and appropriate access into the school.

Springston Rolleston Road is an arterial road with no residential frontage along it. It is anticipated that this road will carry the largest volume of traffic of all the school frontage roads. There will be a larger amount of through traffic and access to the school from this road will need to be carefully considered. It is likely that turning movements into an access from this road would need to be restricted to create a safe access. Access from the road along the northern frontage will also need to be carefully considered given the narrower road width.

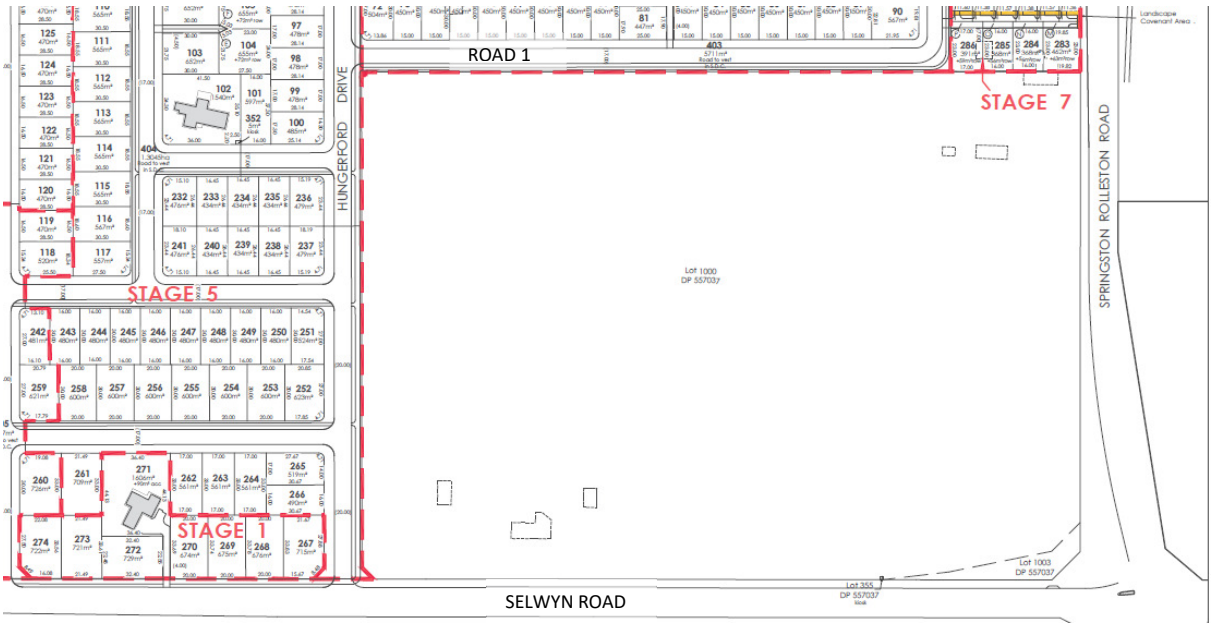

Figure 6.1 Roading network around the school site

Hungerford Drive is assumed to become a local road connecting Selwyn Road to Northmoor Boulevard. This road could provide good vehicular access to the school. It is a straight road with good options along the road for the location of the access, see **Figure 6.1**.

Selwyn Road could also provide vehicular access as it is relatively straight with good options for the location of the access. Although this road will also carry a high amount of traffic a secondary access to the school could be provided with dedicated turning facilities. This road would also present good options to provide bus parking on street. The new proposed roundabout at Springston Rolleston Road and Selwyn Road would provide buses with good turning options.

Selwyn Road, Hungerford Road and the northern road have good options to enable pedestrian access into the site. Springston-Rolleston Road on the other hand is unlikely to provide a safe and appropriate pedestrian access into the school. If a pedestrian access was provided on Springston Rolleston Road then that could encourage parents to drop their children off on Springston Rolleston Road which would not be appropriate. There are also no pedestrian facilities along Springston Rolleston Road on the school side and this is anticipated to remain the same in the near future.

6.6 Summary

The school has four frontage roads, with two of these roads being suitable for providing the main vehicle access to the school and the other two roads have opportunities to provide minor accesses to the school. An appropriate and safe school access location will be able to be provided at this site. The roading network to the north and west of the school is scheduled be constructed in the first half of 2022. The extension of the urban road features, such as lighting and shared paths and footpaths, should be completed on Springston Rolleston Road and Selwyn Road before the school opens.

There is also good provision for pedestrian access if the wider shared path network on Springston Rolleston Road and Selwyn Road is extended to the school site. Pedestrian access can be provided on three of the frontage roads.

It is not anticipated that providing access to the school at this site will have a negative effect on the surrounding roads.

7. Transportation Modelling Network Assessment

Methodology

The Rolleston Transportation Model was developed in 2014 and is used to support transportation planning across the township. The model has been used to assess the impact of traffic associated with the NOR application on the local and wider transport network. The local road links have sufficient capacity to accommodate the additional traffic, therefore the network assessment is presented primarily enables intersection performance to be analysed which has been done for this site by calculating the intersection delays in the vicinity of the school site.

The 'with school' scenario is compared to a baseline which assumes residential activity. If Living Z residential activity were established, it is estimated that the site could accommodate 161 residential units. The trip generation and distribution within the model is matched with an adjacent residential activity zone in the Paramics Model and scaled to represent the 161 units in the baseline.

For this assessment the distribution of trips across the network both for the baseline and the school scenarios are driven by the Paramics model demand matrices. The Paramics model demands have been built from demand imported for the Greater Christchurch strategic transportation models. These have been informed by forecast demographics for the region and so provide a good basis for distribution traffic for the proposed school. The demand for the 'with school' scenario has been calculated assuming a roll of 2,500 pupils which is higher than the 2,200-pupil masterplan roll. This means the modelling assessment undertaken is conservative including the resulting model outputs.

The access arrangements are not yet clear but with the relatively high demands associated with all activities on site there is likely to be drop off and pick up facilities such as that provided at the current Rolleston College. The model is set up with a PUDO arrangement on the Selwyn Road access which will take the highest level of demand in the school scenario. The zones in the Paramics model enable trip distribution to be finely tuned by way of portals and for this assessment 65% of the traffic associated with the school is assumed to be assigned to Selwyn Road while the other 35% is assigned to Hungerford Drive. A further test with a third access on Springston Rolleston Drive has been tested with 60% of the traffic associated with the school is assumed to be assigned to Selwyn Road while 20% is assigned to Hungerford Drive and Springston Rolleston Road. The final route choice of trips to and from the school site will depend on the performance of the network in the model at the time the trip occurs.

The Waka Kotahi School Travel Model referred to in Section 5 is in the process of being refreshed and has a new feature that specifies a peak 30 minute generation. This has helped tailor the demand profile for the school alongside a survey of two primary schools in Rangiora (note there was no similar data available for Rolleston Schools) as the Paramics model distributes the two hour demand into 5 minute slices. The profiles for vehicle arrivals and departures is shown in **Figure 7.2**.

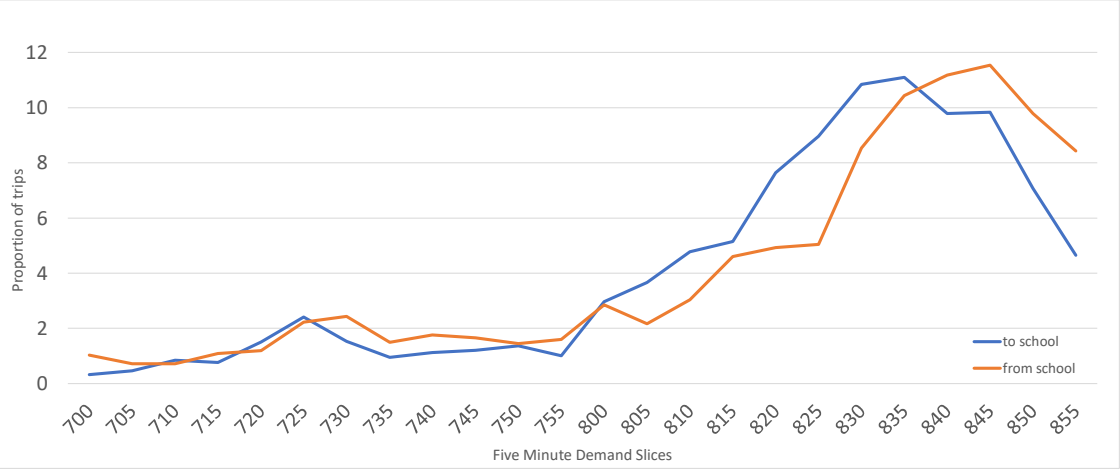

Figure 7.2 Adopted vehicle arrival and departure profiles

The key assumptions from this are that 86.5% of the two hour demand occurs in the 8-9am peak hour and 61.3% occurs in the peak half hour for school related travel.

Results

Comparing the 'with school' and 'baseline' scenarios enables any potential effects to be isolated and assessed. Four intersections have been reported and the detailed outputs are in Appendix A. The outputs include hourly traffic flows, stop-line delays and Level of Service (LoS) for each traffic movement. LoS is a function of delay, and LoS A-D are generally considered to be acceptable in peak traffic periods with LoS E-F corresponding to deteriorating intersection performance and lengthy delays to vehicular traffic. The key intersections included in the assessment are as follows:

- Springston-Rolleston Road / Selwyn Road modelled as a roundabout as per LTP 2021-23
- Springston-Rolleston Road / Northmoor Boulevard as priority controlled
- Selwyn Road / Hungerford Drive as priority controlled
- Selwyn Road / Main School Access as priority controlled

The key intersection near the school is the Springston-Rolleston Road / Selwyn Road roundabout which has a good level of service (LOS) in the 2028 AM peak baseline scenario. With the school demand the roundabout still has a good level of service remaining at LOS A overall. The eastern approach has some additional delay (LOS A to LOS B) with additional right turning opposing traffic from the north however this is still an acceptable level of service in peak periods and is typically for a short period around the school peak. The intersection performance is similar with the inclusion of the third access point on Springston Rolleston Road.

The Springston-Rolleston Road / Northmoor Boulevard intersection was assessed as a priority-controlled intersection. In this scenario on Springston-Rolleston Road there are right turn bays and on the Northmoor Boulevard approach two lanes are provided for a left turn and right turn lane. The left turn lane is short on the Lady Isaac Drive side and longer on the Northmoor Boulevard side reflecting the ranges in carriageway width and localised flaring. Average approach delays increase from a range of 2 to 5 seconds without the school to 4 to 10 seconds with the school and overall at LOS B or better. The intersection performs well with and without the school.

All other access and intersections reported have good performance with and without the school so any effects of the school are negligible for the cases reported. The most at risk movement would be the right turns out of the school via the Selwyn Road access given the highest school demand proportion is assumed there. The baseline right turn demands are around 20 vehicles which increases by around 100 vehicles per hour and even with increased opposing flow from the west the performance is still good overall around the LOS B to LOS C threshold of 15seconds average delay with two or three accesses. It is similar for the right turn in which increases to a higher level of around 200 vehicles per hour in both access scenarios operating at LOS C and average delay of 17 seconds. At Outline Plan stage, the format of the access points can be assessed in more detail including PUDO facilities and on-street drop off.

The model outputs include delay calculations for all other key intersections throughout the Rolleston township and these have been checked after running the model for any other potential issues on the network that may need reporting. This was also combined with visually observing the simulation outputs for any new areas of congestion or pre-existing issues that might be exacerbated by the proposed school traffic. There were no matters identified of concern.

The baseline comparison is simplistic in that the school trips are replaced by a lower amount of residential style trips. However, the town of Rolleston would still have school related activity that would have to use the existing high school or would leave the township for schools in other areas. This means many of the school trips from the proposed site would already be on the network so the analysis is consider to be conservative.

Conclusion

As set out above it is recommended that an Integrated Transport Assessment (ITA) is prepared at the Outline Plan of Works stage, when the receiving transport environment and design/ layout of the school is better known. It is considered that, based on this high level assessment, the potential traffic impacts of the operation of a high school, school and ECE on this site, will be satisfactorily addressed by the appropriate design of the school site and the construction of the new roading network within the proposed subdivisions to link into the wider existing transport network.

The transport network operation with the high demand school scenario operating in the short term indicates that there are minimal effects on the network as a result.

8. Conclusions

The Ministry of Education is seeking to designate land in the Farringdon South-East subdivision for the establishment of a high school, primary school, an Early Childhood Education centre and a Hangarau specialist teaching space.

As set out above it is recommended that an Integrated Transport Assessment (ITA) is prepared at the Outline Plan of Works stage, when the receiving transport environment and design/ layout of the school is better known. It is considered that, based on this high level assessment, the potential traffic impacts of the operation of a high school, primary school and ECE on this site, will be satisfactorily addressed by the appropriate design of the school site and the construction of the new roading network within the proposed subdivisions to link into the wider existing transport network.

It is anticipated that the traffic generation from the proposed school is unlikely to result in any adverse traffic effects. The location, shape of the land parcel, and scale of the school can provide suitable potential access arrangements and car parking. It is also considered that a school on this site can satisfy the outcomes sought by the regional and local transport strategies and plans.

Details surrounding car and cycle parking, access arrangements and pedestrian crossings should be considered during the Outline Plan of Works stage. However, it is noted that the proposed road designs are suitable for vehicular and pedestrian access to the school and the school site is large enough to accommodate an appropriately sized car park.

Overall, it is considered that the school on this site can be supported from a traffic and transportation perspective.

Appendix A
Rolleston Paramics Model Outputs

Rolleston Paramics Model - Intersection Performance Results

Two access Arrangement - 65% Selwyn, 35% Hungerford (2,500 Highschool Roll)

Note: Average delays reported below are stopline based and exclude geometric delays in line with standard Rolleston Model output presentaion

Selwyn Road / Springston Rolleston Road roundabout

		2028 AM Peak Hour 8-9 Baseline					2028 AM Peak Hour 8-9 with Schools				
Approach	**Mvmnt**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**
	Left	52	5	A			45	5	A		
	Thru	219	4	A	4	A	222	5	A	5	A
Rolleston Springston Rd N	Right	47	4	A			157	6	A		
	Left	21	8	A			19	13	B		
	Thru	185	9	A	8	A	243	14	B	14	B
Selwyn Rd E	Right	29	6	A			28	14	B		
	Left	47	4	A			56	6	A		
	Thru	137	4	A	4	A	139	7	A	6	A
Rolleston Springston Rd S	Right	13	5	A			10	5	A		
	Left	55	5	A			160	6	A		
	Thru	227	4	A	4	A	201	4	A	4	A
Selwyn Rd W	Right	113	3	A			111	4	A		
		1143	5		**5**	**A**	1390	7		**7**	**A**

Selwyn Road / Main Access priority intersection

		2028 AM Peak Hour 8-9 Baseline					2028 AM Peak Hour 8-9 with Schools				
Approach	**Mvmnt**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**
	Left	72	4	A	4	A	181	4	A	7	A
School Access N	Right	20	6	A			114	13	B		
	Left	22	1	A	2	A	198	1	A	0	A
Selwyn Rd W	Thru	323	2	A			294	0	A		
	Thru	215	2	A	3	A	249	2	A	8	A
Selwyn Rd E	Right	65	5	A			206	15	B		
		717	6		4	**A**	1241	15		8	**A**

Selwyn Road / Hungerford Dr priority intersection

		2028 AM Peak Hour 8-9 Baseline					2028 AM Peak Hour 8-9 with Schools				
Approach	**Mvmnt**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**
	Left	24	7	A	6	A	35	10	A	12	B
Hungerford Dr N	Right	13	6	A			32	14	B		
	Left	2	2	A	3	A	33	9	A	3	A
Selwyn Rd W	Thru	320	4	A			456	3	A		
	Thru	231	4	A	4	A	317	4	A	5	A
Selwyn Rd E	Right	5	4	A			46	14	B		
		595	4		6	A	919	5		12	**A**

Springston-Rolleston Rd / Northmoor Blvd priority intersection

		2028 AM Peak Hour 8-9 Baseline					2028 AM Peak Hour 8-9 with Schools				
Approach	**Mvmnt**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**
	Left	3	2	A			7	1	A		
	Thru	234	2	A	2	A	315	3	A	4	A
Rolleston Springston Rd N	Right	41	5	A			125	6	A		
	Left	83	4	A			135	6	A		
	Thru	14	6	A	5	A	50	18	C	10	A
Northmoor Blvd E	Right	47	7	A			44	13	B		
	Left	23	1	A			26	1	A		
	Thru	180	0	A	0	A	247	0	A	1	A
Rolleston Springston Rd S	Right	14	3	A			46	4	A		
	Left	32	4	A			61	4	A		
	Thru	14	5	A	4	A	41	10	A	6	A
Northmoor Blvd W	Right	13	5	A			17	7	A		
		697			5	A	1111			10	**A**

Rolleston Paramics Model - Intersection Performance Results

Three access Arrangement - 60% Selwyn, 20% Springston Rolleston, 20% Hungerford (2,500 Highschool Roll)

Note: Average delays reported below are stopline based and exclude geometric delays in line with standard Rolleston Model output presentaion

Selwyn Road / Springston Rolleston Road roundabout

		2028 AM Peak Hour 8-9 Baseline					2028 AM Peak Hour 8-9 with Schools				
Approach	**Mvmnt**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**
	Left	52	5	A			39	5	A		
	Thru	219	4	A	4	A	221	6	A	6	A
Rolleston Springston Rd N	Right	47	4	A			158	6	A		
	Left	21	8	A			21	15	B		
	Thru	185	9	A	8	A	233	15	B	15	B
Selwyn Rd E	Right	29	6	A			49	17	B		
	Left	47	4	A			54	8	A		
	Thru	137	4	A	4	A	138	7	A	7	A
Rolleston Springston Rd S	Right	13	5	A			9	7	A		
	Left	55	5	A			168	7	A		
	Thru	227	4	A	4	A	204	5	A	5	A
Selwyn Rd W	Right	113	3	A			107	4	A		
		1143	5		**5**	**A**	1399	8		**8**	**A**

Selwyn Road / Main Access priority intersection

		2028 AM Peak Hour 8-9 Baseline					2028 AM Peak Hour 8-9 with Schools				
Approach	**Mvmnt**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**
	Left	72	4	A	4	A	170	4	A	9	A
School Access N	Right	20	6	A			120	16	C		
	Left	22	1	A	2	A	198	1	A	0	A
Selwyn Rd W	Thru	323	2	A			311	0	A		
	Thru	215	2	A	3	A	241	2	A	9	A
Selwyn Rd E	Right	65	5	A			211	17	C		
		717	6		4	**A**	1250	17		9	**A**

Selwyn Road / Hungerford Dr priority intersection

		2028 AM Peak Hour 8-9 Baseline					2028 AM Peak Hour 8-9 with Schools				
Approach	**Mvmnt**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**
	Left	24	7	A	6	A	28	8	A	9	A
Hungerford Dr N	Right	13	6	A			18	11	B		
	Left	2	2	A	3	A	21	6	A	3	A
Selwyn Rd W	Thru	320	4	A			481	3	A		
	Thru	231	4	A	4	A	332	4	A	4	A
Selwyn Rd E	Right	5	4	A			27	10	B		
		595	4		6	A	906	4		9	**A**

Springston-Rolleston Rd / Northmoor Blvd priority intersection

		2028 AM Peak Hour 8-9 Baseline					2028 AM Peak Hour 8-9 with Schools				
Approach	**Mvmnt**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**	**Flow**	**Avg Delay**	**LOS**	**Approach delay**	**Approach LOS**
	Left	3	2	A			5	1	A		
	Thru	234	2	A	2	A	373	3	A	4	A
Rolleston Springston Rd N	Right	41	5	A			95	7	A		
	Left	83	4	A			116	7	A		
	Thru	14	6	A	5	A	39	27	D	13	B
Northmoor Blvd E	Right	47	7	A			68	16	C		
	Left	23	1	A			50	1	A		
	Thru	180	0	A	0	A	286	0	A	1	A
Rolleston Springston Rd S	Right	14	3	A			46	4	A		
	Left	32	4	A			58	5	A		
	Thru	14	5	A	4	A	26	14	B	8	A
Northmoor Blvd W	Right	13	5	A			12	10	A		
		697			5	A	1173			13	**B**

T +64 9 486 0898 (Akld)
T +64 3 377 4703 (Chch)
E office@abley.com

Auckland
Level 1, 70 Shortland Street
PO Box 613
Auckland 1140
New Zealand

Christchurch
Level 1, 137 Victoria Street
PO Box 36446
Christchurch 8146
New Zealand

www.abley.com