Rolleston College

RFI Response Memo

Prepared for	Selwyn District Council
Job Number	MED-J040
Version	Final
Issue Date	07 September 2022
Prepared by	Ravindu Fernando, Senior Transportation Engineer Jared White, Principal Transportation Engineer Daisy-Bea Scrase, Graduate Transportation Planner
Reviewed by	Penny Gray, Principal Transportation Engineer

1. Introduction

This technical note responds to the transport related matters raised by Carriageway Consulting on behalf of Selwyn District Council (SDC) regarding the Notice of Requirement (NoR) for Rolleston College. Abley produced an Integrated Transport Assessment (ITA) for education services to support the NoR for designation lodgement. The request for further information was received on 20 June 2022. The responses to these requests are outlined below.

2. RFI Response

The queries raised by Selwyn District Council and our responses to these are noted below.

General

1. **It is noted that the proposal seeks to operate the secondary school as a second campus of the existing Rolleston College. Please can you advise how this will function and whether interaction between the two campuses will result in increased traffic movements, and if so how this might be mitigated (for example, improved walking and cycling facilities).**

   The decisions around how the school will operate, including a split of junior / senior are not yet determined (including the year range), and the designation is seeking to provide for full flexibility in this regard. A more recent roll growth estimates up to 2028 has been provided in the planning response, which in summary states that if year 11 – 13 students are to be accommodated at the new school, the student roll by 2028 will be in the 1,300 – 1,500 students range. This is noticeably less than the full masterplan roll of 2,200 students that the Integrated Transport Assessment (ITA), including the traffic modelling was based on. Accordingly, realisation of the full masterplan roll will be a significant time away, at which point the wider roading network is expected to have significantly improved given the continuing rapid growth in the wider Rolleston area. Therefore, the assessment of network operations provided within the ITA is highly conservative.

As noted in the ITA, 'all ages' school information (that is averaged mode split from primary, secondary and high schools) was used from Waka Kotahi School Travel Model to determine the school modal split (which formed the abasis for the traffic modelling) as the sample size for the high school information was insufficient and not recommended to be used. Therefore, the traffic modelling presents a highly conservative scenario given that a high school typically has a higher active transport mode share with a lower number of pickups/ drop offs. If the site will be developed as a senior campus, this will likely mean a further reduction of vehicular traffic as older students are less likely to be dropped off and picked up. While a senior campus could mean a higher percentage of students driving to school, during the peak hour this presents fewer conflicts as vehicles would only involve a single trip (as opposed to a pickup or drop off scenario which involves both entry and exit trips). Overall, the traffic modelling presented in the ITA is highly conservative, and in reality the number of vehicle movements are likely to be less than what the modelling has assumed.

Whether there will be student and staff movement between the campuses and if so to what extent is difficult to be determined at this stage given there is minimal detail or clarity around the school operation between the two campuses. Any vehicular movements between the two campuses, if any, are likely to be minor and will occur outside the AM and PM peak periods. There are also good walking connections between the two campuses. Further details will be considered as part of a future OPW, when it is expected there will be more certainty around school operations.

Transport

2. **The ITA notes that the site "is located in the Farringdon South-East subdivision". However, the application to the EPA shows that this area was not included, as shown below. It is also not within the site boundaries of the approved EPA plan of the area.**

   This has been responded to in the main document.

3. **The ITA notes that "roundabout control is proposed at Springston Rolleston and Selwyn Road intersection". It is understood that there is presently no funding available for this scheme, and therefore please provide comment as to potential effects at this intersection if the schools were to open with the current intersection geometry remaining in place.**

   Although no funding is presently available for this intersection upgrade the roundabout is shown within the Rolleston Transport Model. It should also be noted that in the formal written comment from SDC on the application to the EPA states that the intersection is planned to be upgraded to a roundabout – *"The intersection of Springston Rolleston Rd and Selwyn Rd is on two arterial routes. It is planned to be upgraded to a roundabout to address the rapidly increasing safety risks it poses from additional traffic in the area, in particular the Selwyn Rd arterial route"*. The document further states that the Selwyn District Council has produced a concept design for a roundabout at the intersection with more detailed design option analysis and a preferred option being identified. It is also mentioned that discussion with Waka Kotahi has identified the intersection upgrade should occur in the 2024-2027 period – *"In previous discussions with the NZ Transport Agency it was identified that this upgrade project should occur in the 2024-2027 period, based on normally expected future traffic use and increasing safety issues."* This would align well with the school build timeframes, given that when the school first opens it will not be at its full student roll. So, although no funding is currently available, it is expected that this roundabout will be funded, and the intersection will be upgraded.

That said, there are two concerns with this intersection in regard to all road users (including school users). One is the underlying and future safety concerns and the second is the form of intersection control.

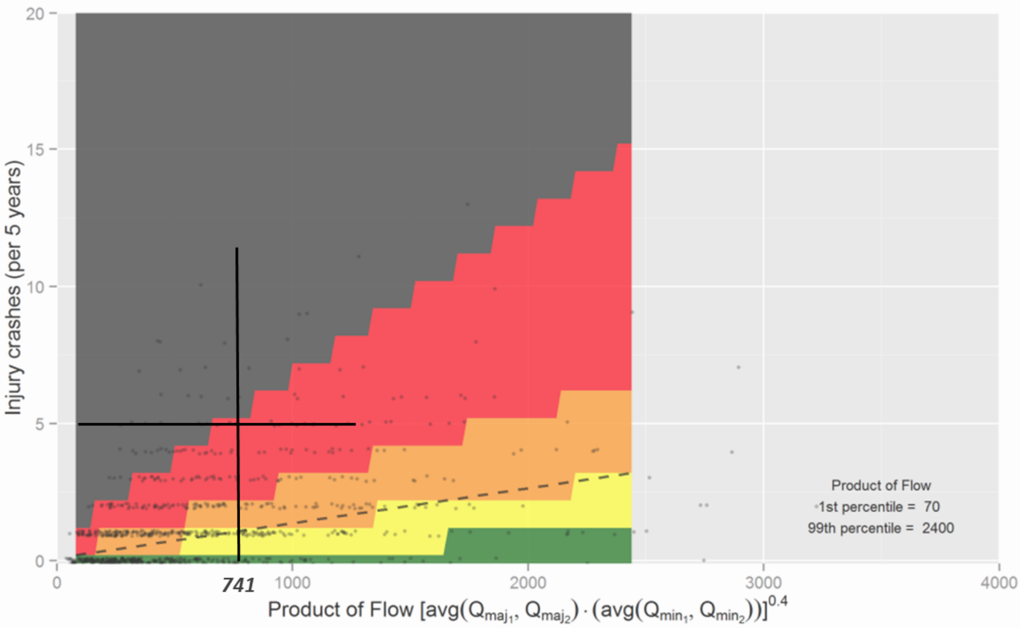
Intersection Safety

The intersection has a poor safety record. A total of nine crashes have occurred at the intersection in the past 10 years including one fatal crash, one serious injury crash and four minor injury crashes. All but one crash have occurred as a result of vehicles on the Selwyn Road approaches failing to stop at the intersection or failing to notice a vehicle. The commonality among the crashes clearly points towards an underlying safety concern at the intersection. Furthermore, the number of crashes has increased over time, with no crashes in the 2012 – 2015 period, one crash each in 2016 and 2017, two crashes each in 2018 and 2019 and three crashes in 2020. It should be noted that 2020 was during Covid lockdowns when traffic volumes were lower than usual. Considering that there had been significant growth in Rolleston over the past few years, this trend in the number of crashes is indicative of an increasing risk as the exposure to an underlying safety concern increase. Noting that significant further growth is expected in Rolleston, particularly in the vicinity of this intersection, the prevailing road safety risk is expected to worsen in future if no interventions are implemented.

Regardless of the historical crash record, rural priority-controlled crossroad intersections are considered one of the highest risks on our road network. Under the Safe systems principles, (The Safe System is a proactive road safety philosophy adopted as part of the Road to Zero, NZ national road safety strategy) T-Bone crashes (which is typically the most prominent crash type at priority controlled crossroad intersections) are considered highly likely to result in a death or serious injury where vehicle speeds are above 50km/h. The current speed limit on Springston Rolleston Road is 60km/h.

The High-Risk Intersection Guide produced by Waka Kotahi provides an assessment framework to identify the Level of safety service (LoSS) of any given intersection. LoSS is a measure of the historic intersection safety performance relative to that expected based on a statistical analysis of New Zealand intersections. It identifies intersections that perform poorly relative to similar intersections of the same configuration, taking into account the speed environment, intersection form and amount of traffic travelling through the intersection. As shown in the figure below LoSS at the intersection is classified as LoSS IV which means the observed injury crash rate is worse than 70% of similar intersections and better than 10% (70 – 90 percentile).

Figure A 5-2: LoSS bands for urban priority controlled crossroad intersections



Note: Based on a sample size of 860 intersections.
The dashed line shows the expected 50%ile. Use this line to assess the potential for improvement with existing control.

<u>Intersection Operational Efficiency</u>

Two sensitivity test model runs have been undertaken so that the existing intersection control at the Springston Rolleston and Selwyn Road intersection can be tested with and without the school. The results of the testing is shown in Table 2-1. This compares the baseline volumes and the full roll school (2,500 high school, 300 primary school and 50 ECE students) volumes with the existing priority intersection control. It should be noted that it is unlikely that the schools will be at full capacity in 2028 and this is considered the worst case scenario. The build roll for the high school is 1,600 students which is a lot less than the 2,500 students accounted for in the model. Therefore, it is anticipated that in 2028 the level of service will be better than that shown in the table.

Table 2-1 2028 Selwyn Road / Springston-Rolleston Road intersection modelling results with existing control

Road		Baseline					With School				
		Volume (veh/hr)	AvgDly (sec)	LOS	AppDly (sec)	App LOS	Volume (veh/hr)	AvgDly (sec)	LOS	AppDly (sec)	App LOS
Rolleston Springston Rd N	L	74	1	A	1	A	79	1	A	2	A
	T	246	1	A			258	1	A		
	R	42	4	A			193	5	A		
Selwyn Rd E	L	19	5	A	9	A	22	18	C	26	D
	T	169	10	A			217	28	D		
	R	56	10	A			40	24	C		
Rolleston Springston Rd S	L	42	2	A	2	A	52	2	A	2	A
	T	146	2	A			143	2	A		
	R	11	4	A			12	5	A		
Selwyn Rd W	L	51	8	A	11	B	138	47	E	50	E
	T	202	13	B			185	53	F		

Road		Baseline					With School				
	R	89	10	A			69	48	E		
Intersection	All	1145	5		11	B	1407	20		50	E

In the baseline the stop-controlled approaches of Selwyn Road have 9 seconds and 11 seconds of average delay for the east and west approaches respectively. With the school demand the average approach delays increase from 9 seconds to 26 seconds on the east approach and 11 seconds to 50 seconds on the west approach. The critical approach in the morning peak is the Selwyn Road west approach which has a level of service (LOS) of LOS B in the baseline and this changes to LOS E in the with school scenario. This is perhaps not surprising as the school demand is more concentrated than the baseline and anecdotally school demand can result in localised periods of queuing and delay that occur for a short duration of time. The through movement from the west has only just passed the threshold for LOS F (50 sec is the threshold).

It should be noted that the full demand of the schools was assigned in the model for the existing intersection control test which is considered conservative as the roll will increase over time and it is not anticipated that in 2028 the schools will be at full capacity. It is more likely that lower levels of demand from the school would be present if the current intersection control is in place at the Springston Rolleston and Selwyn Road intersection in the short term.

It should also be noted that the model was based on 65% of school traffic using Selwyn Road, if the school traffic was dispersed by providing accesses on the other adjacent roads then the intersection would likely also perform better than shown.

4. **Please comment on the ability of Hungerford Drive and Road 1 to accommodate additional traffic associated with the schools (or alternatively, should access to the school site be prohibited from either/both?).**

As noted within Section 3.1 of the ITA, Hungerford Drive is proposed to have a 9.2m wide carriageway, which will allow two-way traffic flow even if both sides of the road are occupied with on-street parking. Hungerford Drive is a local road and the road environment supports low speeds through high access and intersection density. There are three intersections on the non-school side of Hungerford Drive and one on the school side. There are opportunities to provide a school access off Hungerford Drive. Hungerford Drive links Selwyn Road and Northmoor Boulevard which both provide access to the wider arterial roading network. This provides parents and caregivers opportunities to drop children off along this road without having to U-turn or use other residential streets. Access into the school from Hungerford Drive is also considered to be acceptable given the road environment and ability to maintain 2-way traffic flow through the use of no stopping restrictions if required.

Road 1, however, has a carriageway width of 8m and if vehicles are parked on both sides of the road the traffic will only be able to operate in one-way. Road 1 provides access to the residential lots north of the school. It is not anticipated that the road will be used as a through road and therefore traffic volumes are expected to be low. Also, the design of the road encourages low speeds, with the narrow carriageway and 90deg bend in the road. A low volume (e.g., staff access) could be provided from Road 1, if around the access two-way flow can be maintained on Road 1. This could be achieved through the installation of no stopping restrictions. The regularly spaced residential driveways on the non-school side of Road 1 will also provide passing opportunities for traffic using this road.

Overall, we consider, that both roads can accommodate additional school traffic and school accesses can be provided from both roads. The details of this can be resolved at the Outline Plan stage.

5. **It is noted that "buildouts could be considered in the future near the school to facilitate a pedestrian crossing". Please advise whether this measure is proposed as part of the provisions of the designation. On the same topic, the ITA mentions a number of transportation provisions that are assumed to be implemented on the roading network. However, it is important that there is certainty that any measures that are relied upon will indeed be implemented. To that end, please provide details of what roading/transportation measures are proposed to form part of the designation conditions, which measures are confirmed as being provided by others, and which are not confirmed or funded. By way of just one example (and there are many others), under para 3.4 it is noted that "any surrounding intersections should also have pedestrian crossing points on desire lines to encourage active travel to the school site". Who is responsible for implementing these?**

   There are no infrastructure changes proposed to form part of the designation conditions. The Transport Management Plan (TMP) condition requires engagement with SDC during OPW stage and the details around any additional infrastructure can be discussed at this time when the design of the school has been formalised.

   Table 2-2 shows the constructed and future works around the school network that were mentioned in the ITA. At the time of writing the ITA the roading and connectivity comments around the school were based on the engineering plans supplied by the developer. Now, the roads surrounding the school have been constructed and houses are being built and therefore the majority of the 'proposed' transport measures have actually been implemented.

Table 2-2 Transportation Provisions for school

Infrastructure	Who is responsible	Timeline
Springston Rolleston Road / Selwyn Road – roundabout intersection control	Developer, SDC	Future
Northmoor Boulevard - pedestrian crossing points	Developer	Constructed
Northmoor Boulevard / Springston Rolleston / Lady Isaac Drive - Right turn bays - Pedestrian refuge island north of intersection that links shared use paths on Springston Rolleston Road	Developer	Constructed
Northmoor Boulevard / Hungerford Drive intersection – pedestrian crossing facility	Developer	Constructed
Hungerford Drive / Selwyn Road – pedestrian crossing facility	Developer	Constructed
Northmoor Boulevard median island – pedestrian crossing points	Developer	Constructed
Footpath network adjacent to the school - Hungerford Drive - Road 1 - Selwyn Road	 - Developer - Developer - MoE	 - constructed - constructed - School design MoE
Acland Park subdivision shared path on Springston Rolleston Road	Developer	Under construction
Pedestrian Crossing facility across Springston / Rolleston Road near Selwyn Road	SDC	Future – construction as part of roundabout change

Kea Crossing – Hungerford Drive	SDC / MoE	Future (if primary school is developed on site)

6. **It is noted that the site was previously expected to have 161 lots, as noted above but under the application to the EPA, the site was not included within Faringdon South-East. Please clarity (this matter might be more easily addressed under the first point above).**

   Refer response to RFI query 1. It should also be noted that based on the household density of the surrounding areas it would be anticipated that 161 lots would be a sensible estimate for this area.

7. **Please comment on whether, because of travel patterns being suppressed due to Covid-19 related restrictions, a slightly longer timeframe should be considered for the safety assessment.**

   Please refer response to RFI query 2.

8. **It is noted that the specialist hub will operate outside of school hours – however, is this confirmed, and will there be a condition on the designation to ensure this? If not, please comment on whether the traffic should be taken into account.**

   A specialist hub is a common facility covered by the education designation. The proposed hub at this school site does not have any unique operations. The specialist hub will be used by students from the proposed school as well as students from other schools in the vicinity. Students arriving from other schools will arrive from their respective schools as groups in buses, rather than being individually dropped off or picked up at the specialist hub. Given school start and finish times are relatively consistent, the group arrivals and departures will not coincide with the school peak pick up and drop off times. A condition is not considered necessary as its practical operation model will ensure the trips do not coincide with the peak school pickups and drop off periods.

9. **Please clarify whether the figures in the tables are one-way trips or two-way (that is, whether the 903 trips reflect 903 vehicles entering and 903 vehicles exiting, or 451 vehicles entering and 451 vehicles exiting). With 1,041 students travelling by car, 903 vehicles entering would mean an average of 1.15 students per car, whereas 451 vehicles entering would mean an average of 2.3 students per car. The latter seems very high…?**

   The 903 vehicles in the peak hour is not a direct calculation of the total students travelling by car. The 1,041 student passenger trips factors in a rate of 1.26 students per car. Then the 903 vehicles is actually all the students, staff and deliveries that arrive during the AM peak.

   There will be slightly more arrivals than departures. This is due to the staff and student drivers remaining on site, whereas the vehicles dropping students off will exit the site. It should also be noted that not all students will be dropped off within the school grounds and some drop off will occur on the surrounding road network.

   As mentioned in the ITA 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. For this project we also have the Rolleston Transport Model that has school trips incorporated into it.

   The model estimates that 710 vehicles enter the school site and 558 vehicles exit the site in the AM peak. The access with 65% of the traffic shows 438 cars entering and 351 exiting and the access with 35% of the traffic shows 272 cars entering and 207 car exiting. That is a total of 1,268 car movements in the AM peak.

10. Below Table 5.3 is a comment regarding pass-by trips, shared travel etc. Please confirm whether any reductions have been made for this.

There was already a school in the Rolleston Travel Model that was factored up to represent the predicted school roll. We have not applied any further diverted or passer-by trips. This is a highly conservative assumption, particularly in the AM peak as most parents are likely to drop off students on the way to work.

11. Para 6.2 notes 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. Please advise as to the responsibility for providing this connection.

The majority of the school catchment is predicted to come from north of Selwyn Road given the location of the residential development in Rolleston. On Springston Rolleston Road, the shared path is on the eastern (non-school) side of the road. There is a pedestrian refuge island north of Lady Isaac Drive that is expected to be used by the majority of students coming from the north of the school site. This crossing links in with the shared path into the school site via Road 1. South of Lady Isaac Drive the shared path continues on the eastern side, this is currently under construction. Near the intersection with Selwyn Road the shared path follows the proposed roundabout boundary layout and does not continue to the existing cross roads intersection. There is no shared path on the school side of Springston Rolleston Road adjacent to the school or to the north of Northmoor Boulevard. It is recommended that a footpath or a shared path is not provided along the school frontage (i.e., on the school side) of Springston Rolleston Road in the short to medium term. This is primarily to avoid any pick up/ drop off on Springston Rolleston Road as it is not appropriate from both a road safety and an operational perspective given that Springston Rolleston Road is an arterial road carrying high volumes of traffic with a speed limit of 60km/h.

A shared path has been constructed on Selwyn Road up to Hungerford Drive. This links in with the shared path along the school side of Hungerford Drive. It is proposed that the Ministry of Education, through the school building phase, continues the shared path along Selwyn Road. The main purpose of this path is to provide access into the school site from Selwyn Road for students coming from the west. If the Selwyn Road / Springston Rolleston Road intersection is not upgraded when this path is constructed, then it is recommended to terminate the path before the intersection. The speed limit on Springston Rolleston Road changes from 80km/h to 60km/h just south of the Selwyn Road intersection. This southern section of Springston Rolleston Road is rural in nature and the residential development does not start until Selwyn Road. If the shared path on Selwyn Road was extended to Springston Rolleston Road before the intersection upgrade then it will encourage people to cross at the cross roads intersection. Given the predicted operating speeds this would not be a safe location for people to cross. The upgrade to a roundabout will provide traffic islands so people can cross the road in two-stages. Depending on the design, the roundabout could also include speed calming measures, such as raised platforms, which would be consistent with a safe system design. This would provide a safe crossing location for people and would link the Springston Rolleston Road shared path with the Selwyn Road shared path.

12. Para 6.2 also notes the provision of a Kea Crossing. Again, please advise of the responsibility for implementing any works associated with this.

The need for a Kea crossing will be confirmed at the outline plan stage. A kea crossing is a crossing facility for the use of primary school aged children. As stated in Para 6.2 the likely location of a kea crossing would be on Hungerford Drive. A kea crossing requires specific line marking and signage. It is not appropriate to install this until the kea crossing is operational, which requires the primary school to be constructed. If required, the responsibility of implementation would be confirmed in the Outline Plan of Works phase (see RFI query 4).

13. Given that NPS-UD has now removed parking ratios, please comment on the number of on-site spaces that will be provided and whether a parking ratio will form part of the designation conditions.

The TMP will set the parking rates for the site. Parking ratios are determined based on a wide range of factors and the appropriate time to address this is OPW stage. The site is of a sufficient size to have the ability to cater for a large car park/s if required.

14. Since having a pedestrian access onto Springston Rolleston Road is not appropriate, will this be prohibited through the designation conditions?

It is expected that there will be widespread residential development in the vicinity of the site beyond the immediately proposed Farrington South-East Subdivision. The wider Rolleston area is also expected to continue to grow. Whilst providing pedestrian and cycling access from Springston Rolleston Road is unsafe at present, this may change in future with improvements to infrastructure and the overall road and speed environment as residential growth in the area continues. As such, it is preferred that flexibility is retained to provide pedestrian access onto Springston Rolleston Road if and when it would be safe to do so.

15. The traffic model is stated has having been set up with Selwyn Road being the main access. However, para 6.5 says that "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". If that's the case, has a scenario been tested assuming Hungerford Drive to be a main entrance?

At the time of modelling the Selwyn Road access point was considered to be the most likely main access and secondary access activity would occur on Hungerford Drive and hence the Selwyn Road access has the largest demand proportion. However, to answer this query the demand proportions have been switched in a sensitivity test (65% of the total school traffic at Hungerford Drive and 35% at Selwyn Road). The structure of the model setup was retained apart from separating out the turns from the Hungerford exit lane into two separate lanes.

The performance of the turning movement into and out of the Hungerford access is shown below in Table 2-3. The access itself performs well. It shows that the majority of vehicles come from the north and exit towards the north, when Hungerford Drive is the main access.

The other intersections previously reported operate with similar levels of service as before. There are no adverse changes as a result of switching the main access to Hungerford Drive, so this gives some comfort and flexibility in the analysis at this stage.

Table 2-3 2028 Hungerford Access turning movement modelling results

Road		Existing School Scenario					Hungerford as Main Access				
		Volume (veh/hr)	AvgDly (sec)	LOS	AppDly (sec)	App LOS	Volume (veh/hr)	AvgDly (sec)	LOS	AppDly (sec)	App LOS
Hungerford Egress	L	54	3	B	3	A	98	0	A	2	A
	R	153	3	A			254	3	A		
Hungerford Dr N	L	199	0	A	0	A	319	1	A	1	A
Hungerford Dr S	R	73	7	A	7	A	111	10	B	10	B
Worst Approach	All		7	A	7	A		10	C	10	B

*Note that through movements on Hungerford Drive are low at around 10veh/hr and are not reported

16. Please can further details be provided of the new school travel model. If it is relied upon, but has not been subject to testing (or indeed publication) then can it be considered to be reliable?

The data that informs the new school travel model is based on 2017/2018 household travel survey data and in all likelihood if it was investigated separately for this specific project could have yielded similar results. It should be noted that the school travel model is not used to determine traffic generation for the site and only helps to determine aspects of the demand to convert from separately calculated peak one hour demand to the two hour demand in the model and peaking within the peak hour itself. Without this information an estimate would have been made anyway on traffic generation from 7-8am. In previous modelling, using the Rolleston Transport Model, this would have been 10% occurring in this period so the 13.5% from the school model aligns well.

Also, without the peaking data the school demand would have been assumed to occur relatively flat across the peak hour in a similar fashion to static transport modelling software. We consider that the demand profile for the proposed school would have shown a better level of service using the flat peak hour and hence the additional peak data offers a more conservative approach to traffic generation. Also, there was not another data source available to give any better guidance. See the paragraph below from Waka Kotahi on the school travel model feature.

The Waka Kotahi School Travel Model 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 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.

17. Has the primary school arrival data been applied to the high school? If so, what basis has been used for assuming that the patterns of primary school and high school trips are the same?

Primary school trips have been calculated separately as noted in Table 5.2 and while there are primary school trips in the mix the high school is more dominant in the overall traffic generation. As stated in the previous response the new school travel model was used to determine the proportion of trips occurring in the peak half hour and this was based on high school information that itself was determined from 2017/2018 household travel survey data. In any case the new school travel model indicates the proportion of trips in the peak half hour are quite similar for primary and high schools during the morning peak. In the afternoon period they are not so similar as high school pupils generally have more after school activities, so the peak departures are more spread out. The surveys of the two primary schools were used to help define the coarser high school based data discussed earlier into a finer profile of 5 minute slices. As previously stated using a previous model school profile would have meant the peak hour demand was more flat in nature so the profile developed for this analysis will be more conservative as it has a concentrated peak. We consider that the profile for primary schools is more likely to have a prominent peak within the peak hour compared to high school rather than the other way around again making the analysis more conservative.

Prior to addressing the last two queries we need to acknowledge that an incorrect results output was attached to the ITA which were based on a lower generation scenario for the development. To some extent this has caused the queries to be raised however the responses are informed by referring to the correct output which has been appended to this note.

18. Appendix A. One feature of any area-wide transport model is that this will inevitably divert traffic away from congested areas. Looking at the first table:

- The scenario tested is 65% of trips using Selwyn Road

- Earlier in the ITA, it is noted a 2,500 high school will generate 1,026 trips (factoring table 5.4), the 300-student primary school generates 164 trips and the ECE generates 70 trips. Thus 1,260 trips total.

- 65% of this equal 819 trips

- The modelling shows that in the 2028 base + school, Selwyn Road carries 928 vehicles (two-way). Of these, 819 vehicles must be associated with the school, meaning that 109 vehicles are passing traffic.

- However, the 2028 baseline shows that without the school, Selwyn Road carries 674 vehicles (two-way). Consequently, 565 of these existing vehicles must divert to use an alternative route (this then leaves 109 vehicles, to which the 819 school trips are added, making the 928 vehicles seen)

- Is it likely that 84% of traffic on Selwyn Road would divert onto other routes?

The calculation done in this instance is too simplistic as it assumes that all of the school traffic demand turns in and out from the same direction (ie to/from the roundabout side) and doesn't take into account the trips in the baseline from the residential component. These values are all attainable from the intersection performance tables that were in appendix A and updated tables are included with this note.

From the updated values the baseline two-way traffic flow on Selwyn Road is 639vph east of the access and 571vph west of the access. With the proposed school these increase to 965vph east of the access and 922vph west of the access and this net change is 326vph and 351vph respectively.

In the baseline, residential traffic coming from the Selwyn Road access point is 102vph east of the access and 34vph west of the access. Given that the residential demand is removed and then replaced with the school demand the effective changes on Selwyn Road is 428vph east of the access and 385vph west of the access. This total effective change is in the baseline the effective two way flow on Selwyn Road is 813 trips which is in line with the anticipated demand of the school access on Selwyn Road. This indicates that there is actually minimal diversion of existing trips on the Selwyn Road corridor.

19. Appendix A

- At the main school access - it is assumed that the baseline traffic relates to the expected 161 residential lots (but note comments above in respect of this)

- Thus, the traffic flow on the school access under the 'with schools' scenario simply equates to the traffic generation of the school, which is a total of 699 vehicles (181+114+198+206).

- However, the trip generation previously calculated suggests that this should be 819 trips.

- Please clarify the reason for the difference, noting that this is simply traffic turning into and from the school, so intuitively the modelled figure should be similar to the previously calculated figure.

The reviewer is right that the modelled figure for access use on Selwyn Road should be similar to the calculated figure and it was the incorrect output sheet that has caused this discrepancy. The analysis for the response above indicates the use of the access is as expected with an increase on Selwyn Road of 813 vehicles.