VARGA TRAFFIC PLANNING Pty Ltd
Transport, Traffic and Parking Consultants
ACN 071 762 537 ABN 88 071 762 537

11 February 2021
Ref 19090

The Department of Planning and Industry
12 Darcy Street
PARRAMATTA NSW 2150

Attn: Ms Karen Harragon

Dear Karen,

ST LUKE'S GRAMMAR SCHOOL
PROPOSED *SENIOR SCHOOL* CAMPUS & SPORTS CENTRE (SSD-10291)
TRAFFIC & PARKING MATTERS
RESPONSE TO SUBMISSIONS

I refer to your letter dated 11 August 2020 regarding the proposed expansion of St Luke's Grammar School.

This *Response to Submissions* has been prepared in respect of traffic and parking matters raised by DoPIE, TfNSW and Northern Beaches Council raised in their submissions.

DoPIE has requested that a transport pattern (travel mode) survey for both staff and students should be conducted to determine the future travel demands of the expansion proposal, and to inform the preparation of the Work Place Travel Plan.

In conjunction with the abovementioned transport surveys, additional traffic and parking surveys were also undertaken as follows:

- a survey of the school's existing drop-off and pick-up characteristics was undertaken at 210 Headland Road, over a period of 5 consecutive days, and

- a survey of traffic activity generated by the existing uses of the site at 800 Pittwater Road was also undertaken, over a period of 5 consecutive days.

Importantly, the results of the transport mode surveys and drop-off/pick-up surveys of the existing school have been disaggregated into 3 categories as follows:

- *Junior School* (pre-school to Year 6 students)
- *Middle School* (Year 7 to Year 9 students), and
- *Senior School* (Years 10 to 12)

The distinction between the *Junior*, *Middle* and *Senior Schools* is important because, whilst the *Junior School* generates the most traffic, *no change* is proposed in *Junior School* enrolments and accordingly, there will be *no change* in the traffic and parking demands generated by the *Junior School* component. The *Junior School* is not the subject of this application.

It was therefore important to disaggregate the survey results to more accurately quantify the traffic generation characteristics of the *Middle school* and the *Senior School*. The increase in enrolments proposed at those two components of the school are as follows:

- *Middle School*: increase from 719 students to 1000 students (+281 students)
- *Senior school*: increase from 303 students to 600 students (+297 students)

In addition, the increase of 281 *Middle School* students at the existing campus (at 210 Headland Road) will be largely offset by the relocation of the 303 *Senior School* students away from the existing campus to the new senior campus proposed at 800 Pittwater Road, resulting in a nett decrease in total enrolments at the existing campus in Headland Road.

Lastly, it is pertinent to note that the finishing times of the various components of the school are staggered in the afternoon to minimise delays, as part of the *School Traffic Management Plan*. In particular, the *Junior School* component has introduced 3 staggered finishing times to further reduce delays, as set out below:

•	Pre-school:	21 students:	*Junior School*	8:30am-2:45pm
•	Kindergarten to Year 2:	138 students:	*Junior School*	8:30am-2:55pm
•	Year 3 to Year 6:	205 students:	*Junior School*	8:30am-3:05pm
•	Year 7 to Year 9:	355 students:	*Middle School*	8:30am-3:20pm
•	Year 10 to Year 12:	303 students:	*Senior School*	8:30am-3:20pm

The results of the new surveys are summarised below, followed by:

- response to submission raised by the Council (**Annexure 1**)
- response to submission raised by TfNSW (**Annexure 2**)
- response to submission raised by DoPIE (**Annexure 3**)
- Workplace Travel Plan **(Annexure 4)**.

Transport Mode Split Survey Results

The results of the transport mode split surveys are summarised in the graphs below, revealing that:

- approximately 92% of *Junior School* student are driven to/from school, noting that 57% of the students travelled with another student in the car

- the largest proportion of *Middle School* students, approximately 50%, travel to/from school by bus using either school buses or regular STA buses (the latter including the 132 bus and the new B-Line bus service)

- approximately 40% of *Middle School* students were driven to/from school, noting that 27% of the students travel with another student in the car

- the largest proportion of *Senior School* students, approximately 48%, travel to school by bus, using either school buses or regular STA bus services (including the 199 bus and the new B-Line service)

- approximately 35% of *Senior School* students are driven to/from school, noting that 22% of the students travelled with another student in the car.

In summary, the transport mode split survey results indicate that the proportion of students being driven to/from school *decreases* as their age *increases*, and that the proportion of students travelling by public transport or active transport (i.e. walking) increases as students get older. The results of the transport mode split surveys have been used to inform the Work Place Travel Plan, as detailed in **Annexure 4**.

Figure 1: Junior School Travel Mode

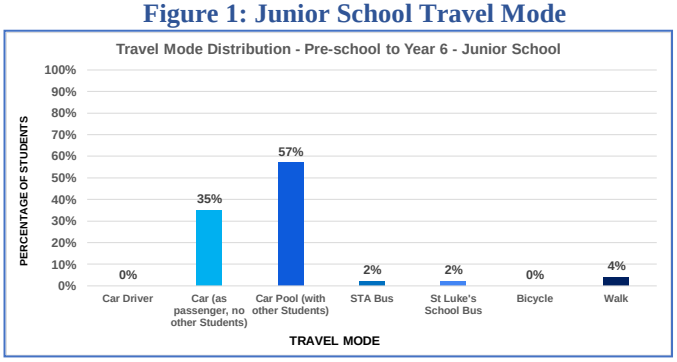


Figure 2: Middle School Travel Mode

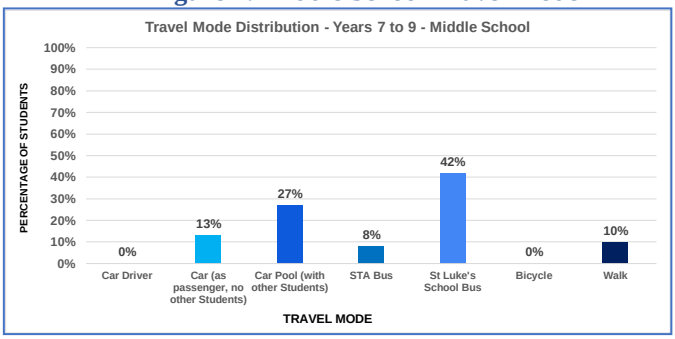
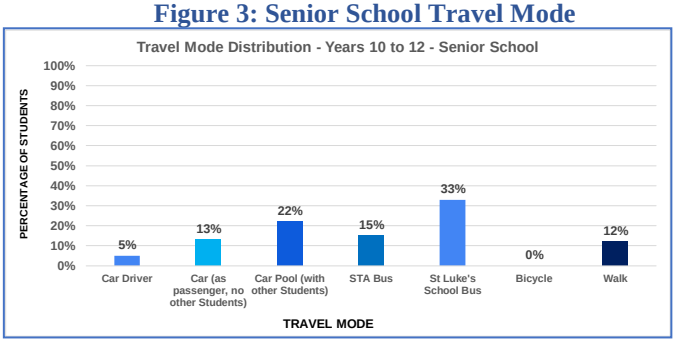


Figure 3: Senior School Travel Mode



Drop-Off and Pick-Up Survey Results

Drop-offs in the morning are quick and efficient, with a typical dwell time of 30 seconds per car. There are *no queues* in the morning extending beyond the existing drop-off/pick-up facilities provided in Headland Road and in Tango Avenue. This can be confirmed by site inspection.

Pick-ups in the afternoon are slower, with a typical dwell time of 70 seconds per car. It is acknowledged that some queuing still occurs in the afternoon during the *Junior School-Up*. However, the extent of that queuing has been reduced with staggered finishing times, particularly since the introduction of a third *Junior School* finishing time (i.e. for K2 Year-2 at 2:55pm).

Significantly however, the *Junior School* queuing is completely dissipated by about **3:15pm** and ***does not coincide*** with *Middle School* (and currently, also the *Senior School*) traffic activity which does not commence until 3:20pm. There are *no queues* extending beyond the existing drop-off/pick-up facilities *after* 3:20pm. This can be confirmed by site inspection.

A survey of the school's existing drop-off and pick-up characteristics were undertaken over a period of 5 consecutive days. The results of those surveys are summarised at 5-minute intervals in the graphs below, revealing that:

- the *Junior School* generates substantially more traffic than both the *Middle School* and *Senior School* components combined

- the *Junior School* generates distinct peak periods between 8:00am-8:30am and between 2:55pm-3:15pm

- *Middle School* traffic activity is significantly lower than that of the *Junior School*, and its pick-up activity in the afternoon *does not coincide* with the peak traffic activity generated by the *Junior School*

- the *Senior School* generates the least amount of traffic activity, and is the most widely dispersed, with less distinctive "peak" periods. It is noted in this regard that some 65% of *Senior School* students attend additional classes "before" or "after" school hours, arriving as early as 7am and departing as late as 4:30pm.

Figure 4: Results of Drop-off & Pick-up Surveys - Junior School (Number of Cars per 5 Minutes)

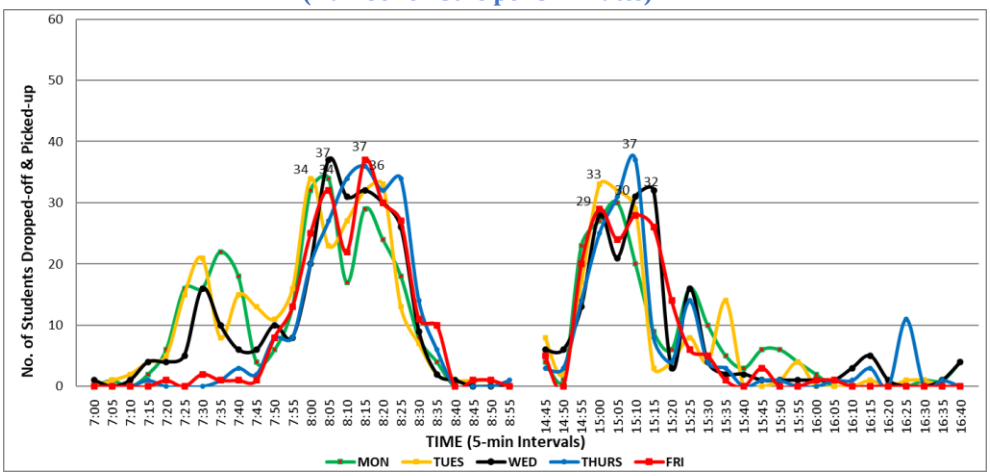


Figure 5: Results of Drop-off & Pick-up Surveys - Middle School (Number of Cars per 5 Minutes)

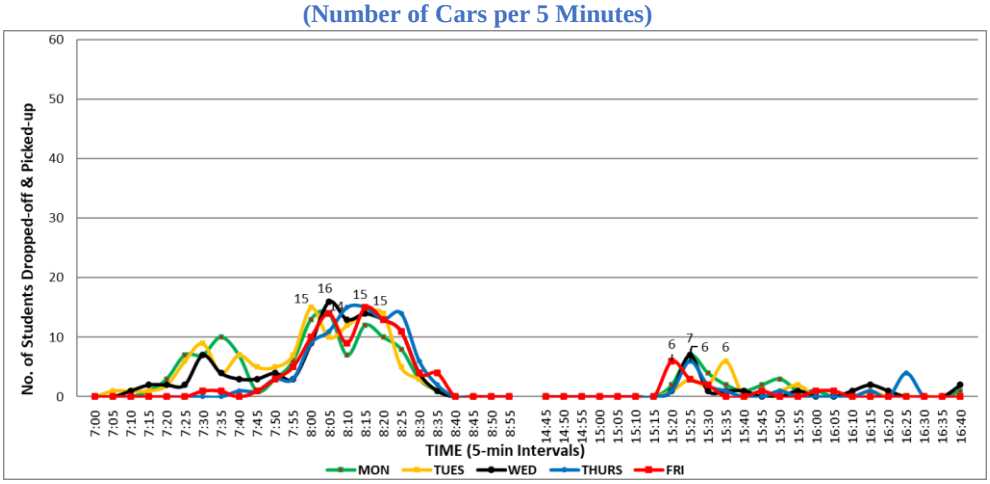
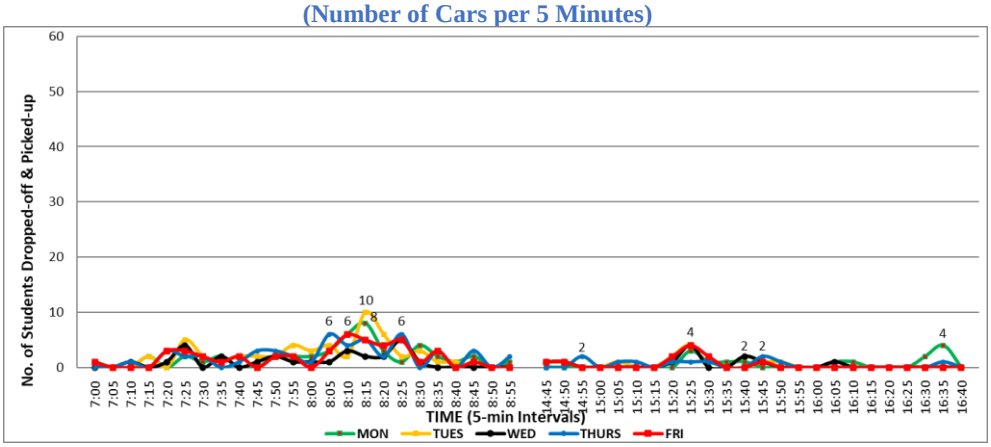


Figure 6: Results of Drop-off & Pick-up Surveys - Senior School (Number of Cars per 5 Minutes)



Projected Future Drop-Offs and Pick-Ups

As noted in the foregoing, there will be *no increase* in *Junior School* enrolments. The increase in enrolments is proposed in the *Middle School* and in the *Senior School* only, as follows:

- *Middle School*: increase from 355 students to 636 students (+281 students)
- *Senior school*: increase from 303 students to 600 students (+297 students)

The existing traffic flows generated by the *Middle School* and the *Senior School* (Stages 2 & 3) have been extrapolated on a pro-rata basis at 5-minute intervals to determine the total cumulative traffic flows expected to be generated upon achieving their maximum enrolments, as set out in the graphs below.

Figure 7: Projected Future Middle School Drop-Offs & Pick-Ups (Number of Cars per 5 Minutes)

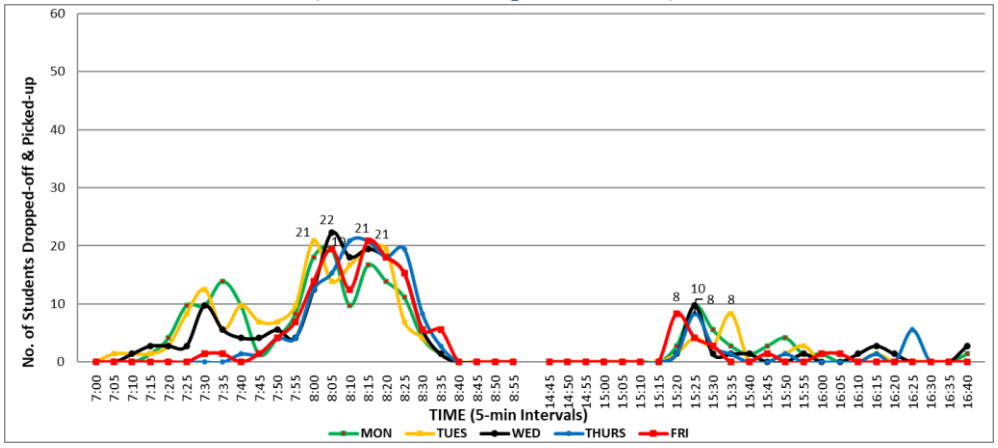


Figure 8: Projected Future Senior School Drop-Offs & Pick-Ups in Stage 2 (Number of Cars per 5 Minutes)

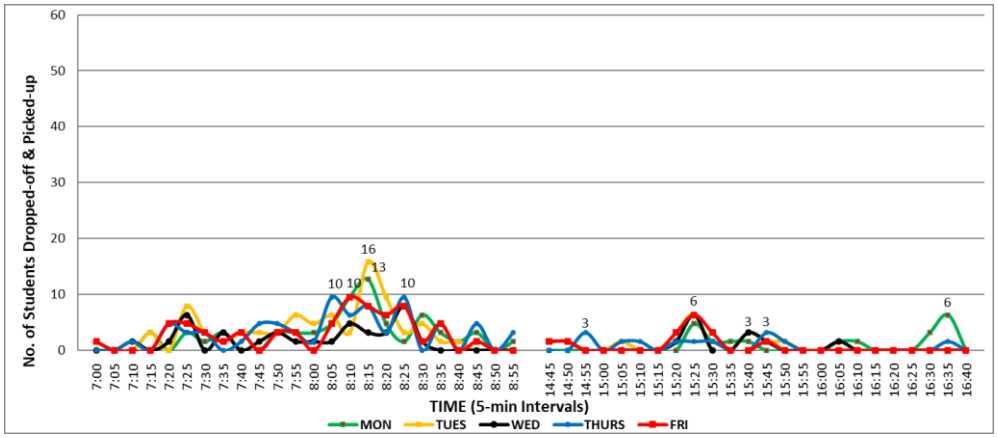
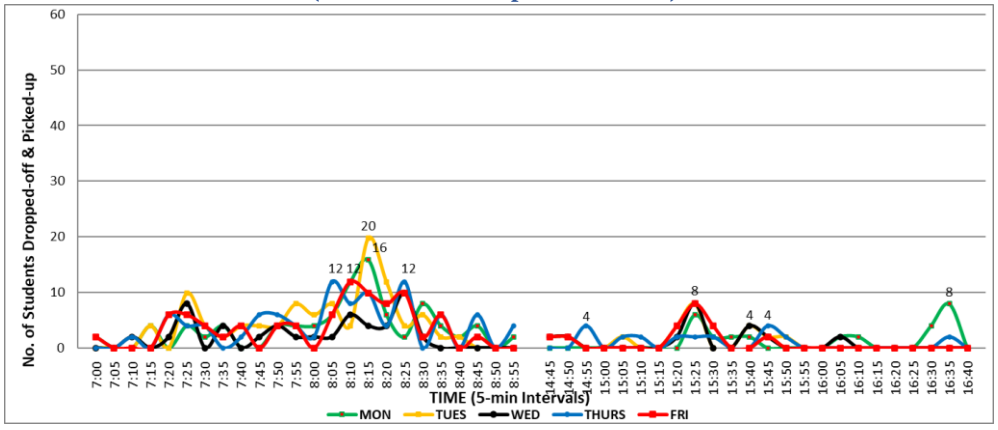


Figure 9: Projected Future Senior School Drop-Offs & Pick-Ups in Stage 3 (Number of Cars per 5 Minutes)



Senior School Drop-Off & Pick-Up Bay Assessment

An analysis of the drop-off and pick-up characteristics of the relocated *Senior School* has been undertaken at 5-minute intervals to determine the average number of cars that will be stopped to drop-off or pick-up *Senior School* students in each 5-minute period. The analysis is based on:

- projected future *Senior School* drop-off and pick-up demands illustrated on Figure 8 (Stage 2) and Figure 9 (Stage 3)

- a proposed *Senior School* drop-off/pick-up bay capacity of 7 cars in Stage 2, and a capacity of 12 cars in Stage 3, (with queuing for a further 4 cars available in both stages *without* disrupting other traffic flows in/out of the site)

- a drop-off duration of 30 seconds per car in the morning and a pick-up duration of 70 seconds per car in the afternoon recorded at the existing indented bay in Tango Avenue

- an increase in existing enrolments from 303 students to 480 students proposed in Stage 2, and to 600 students proposed after completion of Stage 3 at the new campus.

The results of the *Senior School* drop-off and pick-up bay assessment are summarised on Figures 10 & 11 below, indicating that:

- the peak **drop-off** demand in **Stage 2** will be 1.6 cars, occurring at 8:15am (Figure 10)
- the peak **pick-up** demand in **Stage 2** will be 1.4 cars, occurring at 3:25pm (Figure 10)
- the peak **drop-off** demand in **Stage 3** will be 2.0 cars at 8:15am (Figure 11)
- the peak **pick-up** demand in **Stage 3** will be 1.9 cars at 3:25pm (Figure 11).

Figure 10 - Number of Cars Stopped to Drop-Off or Pick-Up: Senior School Students in Stage 2

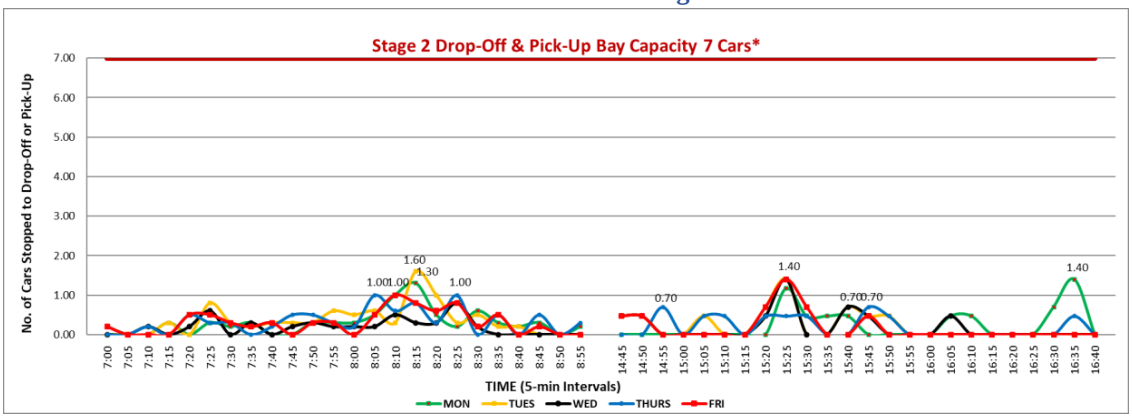
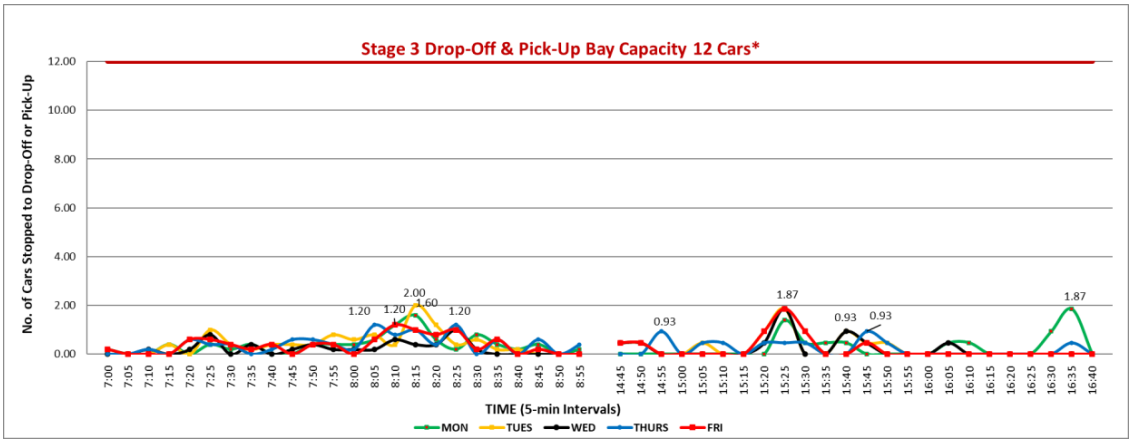


Figure 11 - Number of Cars Stopped to Drop-Off or Pick-Up: Senior School Students in Stage 3



** Plus additional queuing for 4 cars on the driveway*

The layout of the drop-off/pick-up bay proposed on the *Senior School* site in Stage 2 is illustrated on Figure 12 and makes provision for the following:

- a projected peak drop-off/pick-up demand of 1.6 cars and 1.4 cars respectively (rounded-up to 2 cars), shown in red
- a spare capacity of a further 5 cars in the drop-off/pick-up bay, shown in green
- an overflow capacity of a further 4 cars on the driveway which can be accommodated ***without*** disrupting other traffic flows in or out of the site, shown in yellow
- the capacity to accommodate a total of 11 cars without disrupting other traffic flows in/out of the site

By way of comparison, the drop-off/pick-up bay proposed on the *Senior School* site in Stage 2 will have the *same capacity* as the school's existing indented bay in Tango Avenue, but will cater for *less than one-third the number of students*, whilst noting also that those *Senior School* students will generate substantially less traffic activity than both the *Middle School* and *Junior School* students.

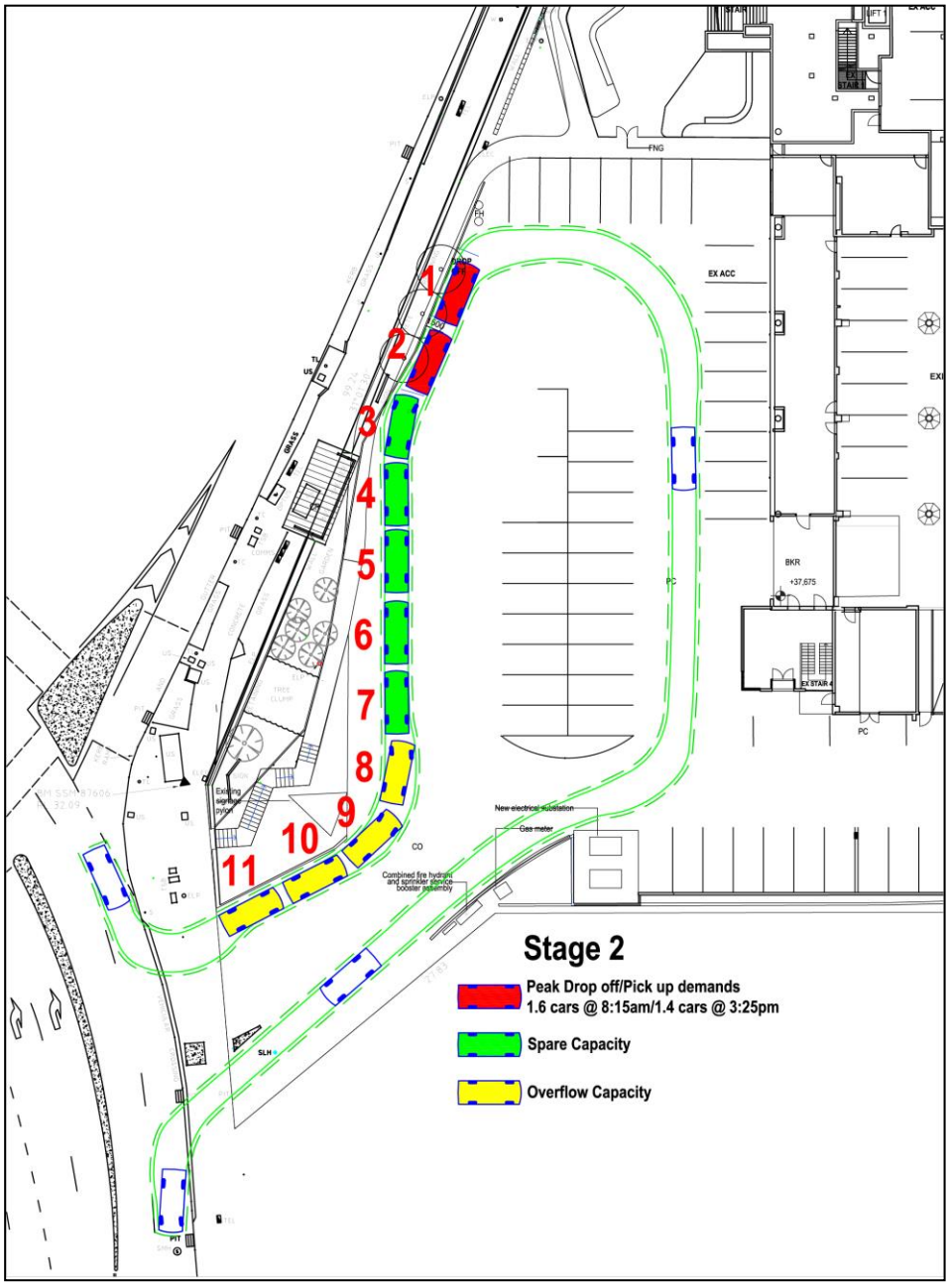


Figure 12 – Proposed Stage 2 *Senior School* Drop-Off/Pick-Up Bay

The layout of the drop-off/pick-up bay proposed on the *Senior School* site in Stage 3 is illustrated on Figure 13 and makes provision for the following:

- a projected peak drop-off/pick-up demand of 2.0 cars and 1.9 cars respectively (rounded-up to 2 cars), shown in red
- a spare capacity of a further 5 cars in the drop-off/pick-up bay, shown in green
- an overflow capacity of a further 4 cars on the driveway which can be accommodated ***without*** disrupting other traffic flows in or out of the site, shown in yellow
- the capacity to accommodate 16 cars without disrupting other traffic flows in/out of the site

By way of comparison, the drop-off/pick-up bay proposed on the *Senior School* site in Stage 3 will have a *greater capacity* than the school's existing indented bay in Tango Avenue, but will cater for approximately *half the number of students*, whilst noting also that those *Senior School* students will generate substantially less traffic activity than both the *Middle School* and *Junior School* students.

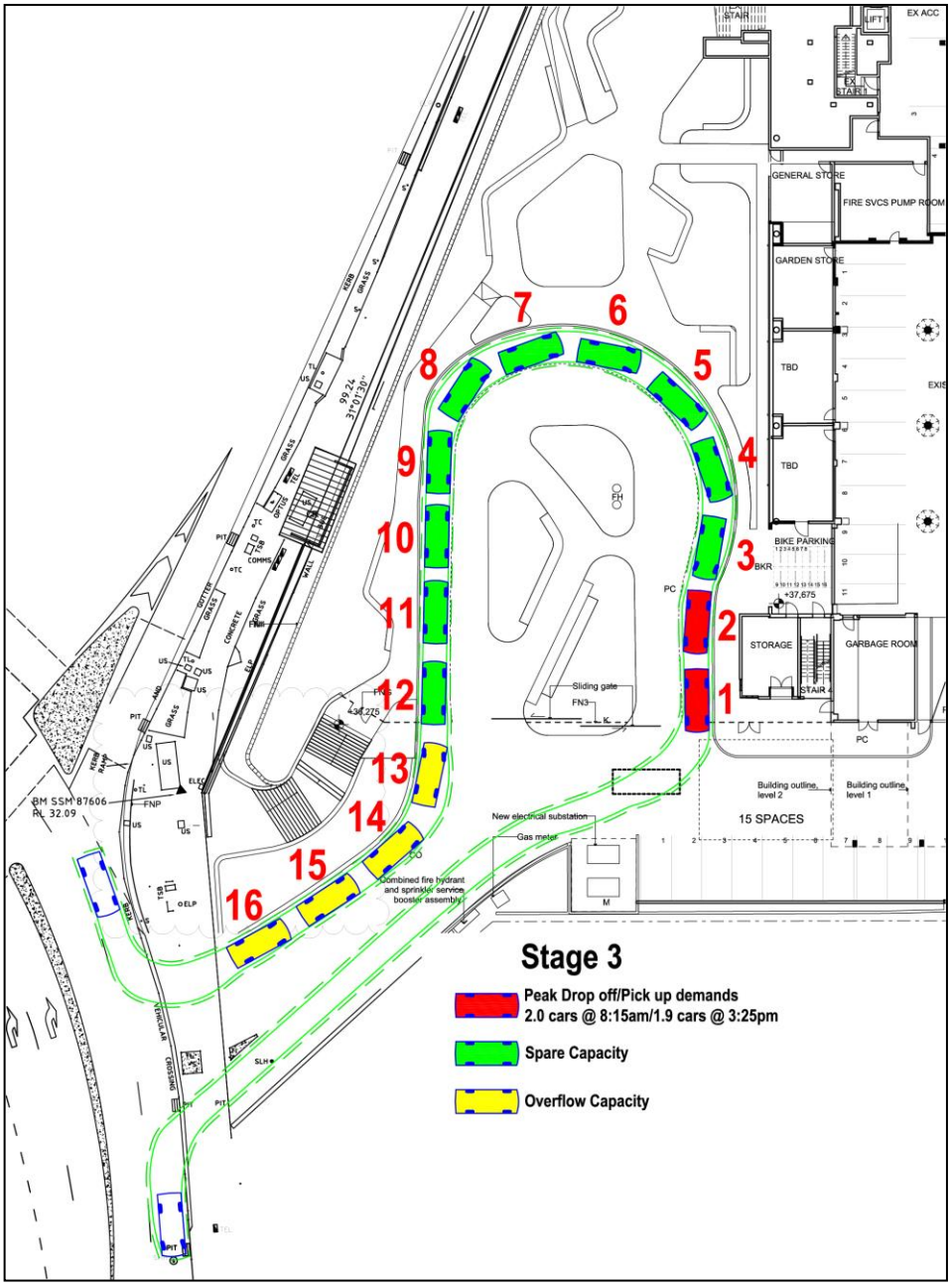


Figure 13 – Proposed Stage 3 *Senior School* Drop-Off/Pick-Up Bay

In summary, the analysis confirms that the *Senior School* drop-off and pick-up demands can be *fully accommodated* by the drop-off/pick-up bays proposed within the 800 Pittwater Road site in Stages 2 & 3, with substantial spare capacity, such that there is no risk of cars queuing into the signalised intersection.

Projected Nett Change in Traffic Activity at 210 Headland Road

A comparison of the *school peak* hour traffic flows generated by the existing 303 *Senior School* students (to be relocated at 800 Pittwater Road) with the new 281 *Middle School* students that will replace them is set out in Table 1 below. Whilst there are some variations from day-to-day, the analysis indicates that the increase of 281 *Middle School* students will be largely offset by the relocation of the 303 *Senior School* students to the new campus, as set out in Table 1 below.

Table 1 - Nett Change in Drop-Offs & Pick-Ups at 210 Headland Road During the AM & PM School Peak Hours Vehicles per Hour (vph)

	Nett Increase in Middle School Drop-Offs & Pick-Ups Generation		**Less Existing Senior School Drop-Offs & Pick-Ups to be Relocated***		***Nett Change* in Drop-Offs & Pick-Ups at 210 Headland Rd**	
	AM	**PM**	**AM**	**PM**	**AM**	**PM**
Monday	40 vph	10 vph	30 vph	8 vph	+10 vph	+2 vph
Tuesday	41 vph	6 vph	40 vph	10 vph	+1 vph	-2 vph
Wednesday	38 vph	12 vph	20 vph	9 vph	+18 vph	+3 vph
Thursday	32 vph	16 vph	35 vph	8 vph	-3 vph	+8 vph
Friday	31 vph	10 vph	32 vph	9 vph	+-1 vph	+1 vph
Five Day Average	**36 vph**	**11 vph**	**31 vph**	**9 vph**	**+5 vph**	**+2 vph**

* Does not include *Senior School* students who will continue to be dropped-off or picked-up at 210 Headland Road with their younger siblings

In summary, there will be no nett change in the level of traffic activity using the existing drop-off/pick-up facilities at 210 Headland Road, particularly after 3:20pm (which is the subject of this application).

Less Intensive Use of the Site at 800 Pittwater Road in Traffic Flow terms

Additional traffic surveys were conducted over a period of 5 consecutive days to accurately quantify the level of traffic activity generated by the existing commercial uses of the 800 Pittwater Road site (Table 2).

Additional surveys were also conducted over a period of 5 consecutive days at the existing school to enable the traffic generation characteristics of the *Middle School* and the *Senior School* to be accurately identified (Table 3), noting that there will be no change in *Junior School* enrolments or traffic activity.

A comparison of the traffic survey results of the existing commercial uses and the proposed future use of 800 Pittwater Road as a *Senior School* campus is set out in Table 4 below, revealing that:

- the existing commercial uses of the site generate more than 3200 vehicles per day
- the projected future uses of the site as a *Senior School* is expected to generate approximately 644 vehicles per day.

Table 2 - Results of Traffic Surveys Existing Commercial Uses at 800 Pittwater Road Vehicles Per Day (vpd)			
	In	**Out**	**Total**
Monday	1,674 vpd	1,692 vpd	3,366 vpd
Tuesday	1,739 vpd	1,758 vpd	3,497 vpd
Wednesday	1,592 vpd	1,611 vpd	3,203 vpd
Thursday	1,537 vpd	1,527 vpd	3,064 vpd
Friday	1,475 vpd	1,517 vpd	2,992 vpd
Five Day Average	**1,603 vpd**	**1,621 vpd**	**3,224 vpd**

Table 3 - Projected Future Traffic Flows* Proposed Senior School at 800 Pittwater Road Vehicles Per Day (vpd)			
	In	**Out**	**Total**
Monday	327 vpd	327 vpd	654 vpd
Tuesday	339 vpd	339 vpd	678 vpd
Wednesday	297 vpd	296 vpd	592 vpd
Thursday	329 vpd	329 vpd	658 vpd
Friday	319 vpd	319 vpd	638 vpd
Five Day Average	**322 vpd**	**322 vpd**	**644 vpd**

** Includes after-hours community uses of the pool*

In summary, the analysis indicates that here will be a very substantial reduction in the daily traffic flows generated by the 800 Pittwater Road site following its conversion from *commercial uses* to a *Senior School* campus, from approximately 3,224 vpd to 644 vpd, a reduction of 2,580 vpd, as set out in Table 4 below.

Table 4 - Nett Reduction in Traffic Flows As a Consequence of the Proposed Senior School at 800 Pittwater Road Vehicles Per Day (vpd)			
	In	**Out**	**Total**
Existing Commercial Uses	1,603 vpd	1,621 vpd	3,224 vpd
Proposed Senior School Campus	322 vpd	322 vpd	644 vpd*
Nett Reduction in traffic	**-1,281 vpd**	**-1,299 vpd**	**-2,580 vpd**

** Includes after-hours community uses of the pool*

In particular, it is noted that the majority of the projected future daily traffic flows expected to be generated by the *Senior School* campus will occur during the morning and afternoon *"school peak"* periods, with little or no traffic activity during the day-time, or after 4:30pm in the afternoons (apart from community uses of the pool).

A similar comparison has also been made between the existing and projected future uses of the site during the 1-hour *"school peak"* period as set out below, revealing that:

- the existing commercial uses of the site generate in the order of 190 vph to 251 vph during the AM & PM *"school peak"* hours respectively (Table 5)

- the proposed future uses of the site as a *Senior School* is expected to generate in the order of 188 vph & 135 vph during the AM & PM *"school peak"* hours respectively (Table 6).

Table 5 - Results of Traffic Surveys
Existing Commercial uses at 800 Pittwater Road
Vehicles Per Hour (vph)

	AM School Peak Hour			PM School Peak Hour		
	In	**Out**	**Total**	**In**	**Out**	**Total**
Monday	98 vph	81 vph	179 vph	148 vph	123 vph	271 vph
Tuesday	93 vph	94 vph	187 vph	132 vph	99 vph	231 vph
Wednesday	88 vph	78 vph	166 vph	139 vph	119 vph	258 vph
Thursday	102 vph	93 vph	195 vph	117 vph	125 vph	242 vph
Friday	116 vph	108 vph	224 vph	127 vph	126 vph	253 vph
Five Day Average	**99 vph**	**91 vph**	**190 vph**	**133 vph**	**118 vph**	**251 vph**

Table 6 - Projected Future Traffic Flows*
Proposed Senior School at 800 Pittwater Road
Vehicles Per Hour (vph)

	AM School Peak Hour			PM School Peak Hour		
	In	**Out**	**Total**	**In**	**Out**	**Total**
Monday	117 vph	60 vph	177 vph	58 vph	65 vph	123 vph
Tuesday	146 vph	80 vph	226 vph	62 vph	85 vph	147 vph
Wednesday	104 vph	40 vph	144 vph	60 vph	88 vph	148 vph
Thursday	131 vph	70 vph	201 vph	54 vph	58 vph	112 vph
Friday	127 vph	64 vph	191 vph	60 vph	88 vph	148 vph
Five Day Average	**125 vph**	**63 vph**	**188 vph**	**59 vph**	**77 vph**	**136 vph**

** Includes arrival of first swim school class / community uses of the pool at 4pm*

The results of the analysis indicate that the change of use proposed at 800 Pittwater Road from *commercial uses* to a *Senior School* campus will result in a reduction in traffic flows generated during the *"school peak"* hours (i.e. 7:30am-8:30am and 3:20pm-4:20pm) of approximately 2 vph and 116 vph respectively, as set out in Table 7 below.

Table 7 - Nett Reduction in Traffic Flows
As a Consequence of the Proposed Senior School at 800 Pittwater Road
Vehicles Per Hour (vph)

	AM School Peak Hour			PM School Peak Hour		
	In	**Out**	**Total**	**In**	**Out**	**Total**
Existing Commercial Uses	99 vph	91 vph	190 vph	133 vph	118 vph	251 vph
Proposed Senior School Campus	125 vph	63 vph	188 vph	59 vph	77 vph	135 vph
Nett Reduction	**+26 vph**	**-28 vph**	**-2 vph**	**-74 vhp**	**-41 vph**	**-116 vph**

In addition, it is also pertinent to note that the reduction in traffic activity generated by the site later the afternoon, during the *"road peak"*, will be even more substantial, down from the existing commercial uses of more than 300 vph to just 84 vph associated with the swim school/community uses of the pool.

Less Intensive Use of the Site at 800 Pittwater Road in Parking Terms

Parking for the school uses proposed on the site is to be provided in accordance with Council's DCP parking requirements. This will result in the number of car parking spaces being reduced from an existing 182 spaces to 131 spaces in Stage 2 (whilst *Officeworks* remains on the site), and then down to 90 spaces when the *Senior School* campus is fully developed, as set out in Table 8 below.

Table 8 - Existing & Proposed Off-Street Parking 800 Pittwater Road			
	Existing	**Stage 2**	**Stage 3**
Radiology Clinic	34 spaces*	n/a	n/a
Fitness First Gym	114 spaces*	n/a	n/a
Officeworks	40 spaces*	40 spaces*	n/a
School Staff	n/a	48 spaces	60 spaces
Visitors & Builders	n/a	28 spaces	5 spaces
Year 12 Students	n/a	15 spaces	25 spaces
TOTAL	**182 spaces**	**131 spaces**	**90 spaces**

* In accordance with DA Consent Conditions for each use

Conclusion

The proposed development will involve the relocation of the existing *Senior School* (currently 303 students) to a new *Senior School*-only campus for 600 students located at 800 Pittwater Road, Dee Why. Relocation of the *Senior School* campus will enable enrolments in the *Middle School* to be increased with an additional 281 students at 210 Headland Road.

A number of additional surveys have been undertaken to identify the transport mode split of students and staff. A number of additional surveys have also been undertaken over a period of 5 consecutive days to identify the traffic generation characteristics of the existing school, as well as the existing commercial uses of the site at 800 Pittwater Road. These additional surveys have informed the preparation of a Workplace Travel Plan, and allowed the projected future traffic generation characteristics of the proposed development to be more accurately quantified.

Key findings of this assessment are:

- the transport mode split surveys indicate that the proportion of students being driven to/from school *decreases* as their age *increases*, and conversely, that the proportion of students travelling by public transport or active transport (i.e. walking) increases as students get older (see Figures 1, 2 & 3)

- the *Junior School* generates the most traffic, with distinctive peak periods between 8:00am-08:30am and between 2:55pm-3:15pm, resulting in *some queues* for a brief period in the afternoons before 3:15pm (see Figure 4). However no changes are proposed to *Junior School* enrolments

- the *Senior School* generates the least traffic activity, and is the most widely dispersed, with less distinctive "peak" periods, noting that a large proportion of *Senior School* students attend additional classes *before* or *after* school, arriving as early as 7:00am and departing as late as 4:30pm (see Figure 6)

- the existing traffic flows have been extrapolated on a pro-rata basis to determine the total or cumulative traffic flows expected to be generated by the *Middle School* and the *Senior School (Stages 2 and 3)* upon achieving their maximum enrolments (Figures 7, 8 and 9)

- the proposed increase of 281 *Middle School* students at the existing campus will be largely offset by the relocation of the 303 *Senior School* students to the new campus, with *no nett change* in the level of traffic activity using the existing drop-off/pick-up facilities at 210 Headland Road (Table 1)

- analysis of the projected future *Senior School* traffic demands indicates that the peak drop-off and pick-up demands will be in the order of 1.6 cars in Stage 2 and 2 cars in Stage 3 stopped in the proposed *Senior School* drop-off/pick-up bay (see Figures 10 & 11)

- the drop-off/pick-up bay proposed on the *Senior School* site will have a capacity of 7 cars in Stage 2, increasing to 12 cars in Stage 3 (with queueing for a further 4 cars available in both stages *without* disrupting other traffic flows in and out of the site) as illustrated in Figures 12 & 13.

In essence, the drop-off/pick-up bay proposed on the *Senior School* site will have a greater capacity than the school's existing indented bay in Tango Avenue, but will cater for just over half the number of students, whilst noting also that those *Senior School* students will generate the least amount of traffic activity.

In addition, it is also pertinent to note that the proposed relocation of the *Senior School* campus to the new site at 800 Pittwater Road will result in a much less intensive use of the site in traffic and parking terms as follows:

- daily traffic flows generated by commercial uses of the site will be reduced from approximately 3,224 vehicles per day (Table 2) to 644 vpd (Table 3) upon completion of the *Senior School* campus, a reduction of some 2,580 vpd (Table 4)

- traffic flows generated by the site during the *"school peak"* hours will also be reduced, by approximately 2 vph and 116 vph in the morning and afternoon respectively (Table 7)

- the amount of car parking on the site will be progressively reduced from an existing 182 spaces down to 131 spaces in Stage 2 and 90 spaces in Stage 3 (Table 8).

Please do not hesitate to contact me on telephone 9904 3224 should you have any enquiries.

Yours sincerely

Robert Varga
Director
Varga Traffic Planning Pty Ltd

ANNEXURE 1

Response to Submissions
Matters Raised by Northern Beaches Council

Access via Pittwater Road

The preference of Council is that the access be provided on Pittwater to avoid the potential of rear end collisions when turning from Pittwater Road onto Harbord Road, being that the access point is close to the intersection.

An access directly off Pittwater Road would provide better accessibility and improve safety. Further, the reconfiguration would support the possibility for additional parking capacity.

TfNSW have advised that it will not accept a new entry/exit driveway off Pittwater Road. In addition, an access directly off Pittwater Road would likely result in the loss of off-street car parking as additional ramps would be required within the existing basement car parking area. It is noted in this regard that the current car parking arrangements propose to provide car parking for the school in accordance with Council's DCP requirements.

A number of other options for providing access to the site have been investigated as indicated on the Traffic Access Plan prepared by *TZG Architects,* however none of these options were feasible because:

- they required additional property acquisition and/or
- there were insurmountable geometric design problems, such as a height difference of 20m, which could only be resolved with lengthy ramping arrangements that would dominate the *Senior School* site, and
- the lengthy ramping arrangements would require *demolition* of the existing building on the site. This would prevent adaptive reuse of the existing building as well as substantially reducing the floor area that would be available for educational purposes.

The existing vehicular access arrangements are therefore considered the most appropriate, given that:

- the existing driveway has been in use for many years, and caters for all vehicle sizes, including large 12.5m long HRV trucks and/or buses
- there will be a very substantial reduction in traffic flows using the existing driveway, from an average of 3,200 vehicles per day (vpd) at present to 640 vpd in the future.

Traffic volumes and RMS input

The traffic volumes assumed for the Senior Campus, are deemed adequate. RMS input in the assessment of the application is required as the proposal will directly impact a set of signals and the state road network.

The anticipated net decrease in traffic generation of the site is deemed beneficial on the network.

A detailed analysis demonstrating the reduced traffic flows expected to be generated by the site is provided in the introduction to this report.

In summary, the analysis indicates that here will be a very substantial reduction in the daily traffic flows generated by the 800 Pittwater Road site following its conversion from *commercial uses* to a *Senior School* campus, from approximately 3,224 vpd to 644 vph, a reduction of 2,580 vpd, as set out in Table 4 below.

Table 4 - Nett Reduction in Traffic Flows
As a Consequence of the Proposed Senior School at 800 Pittwater Road
Vehicles Per Day (vpd)

	In	Out	Total
Existing Commercial Uses	1,603 vpd	1,621 vpd	3,224 vpd
Proposed Senior School Campus	322 vpd	322 vpd	644 vpd
Nett Reduction	**-1,281 vpd**	**-1,299 vpd**	**-2,580 vpd**

The results of the analysis also indicate that the change of use would also result in a reduction in traffic flows generated during the *"school peak"* hours (i.e. 7:30am-8:30am and 3:20pm-4:20pm) of approximately 2 vph and 116 vph respectively, as set out in Table 7 below.

Table 7 - Nett Reduction in Traffic Flows
As a Consequence of the Proposed Senior School at 800 Pittwater Road
Vehicles Per Hour (vph)

	AM School Peak Hour			PM School Peak Hour		
	In	Out	Total	In	Out	Total
Existing Commercial Uses	99 vph	91 vph	190 vph	133 vph	118 vph	251 vph
Proposed Senior School Campus	125 vph	63 vph	188 vph	59 vph	77 vph	135 vph
Nett Reduction	**-26 vph**	**-28 vph**	**-2 vph**	**-74 vhp**	**-44 vph**	**-116 vph**

<u>Further information</u>

There is insufficient information provided with the application and additional information is required to address the below issues:

-How the increase in the student numbers at No. 210 Headland Road will impact the local traffic network, particularly in regard to pick-up/drop-off periods. The following information is required:

- ***Comparison of the existing student mix at No.210 Headland Road would suggest that approximately 27% of the junior students and 17% of the senior students, arrive by car.***
- ***This this would indicate that once the senior campus operates at 100% capacity, 1,000 students will be attending the Junior Campus at the above rate of drop-off and pick-up.***
- ***This would relate to an increase of almost 300 students to the junior campus.***
- ***In accordance with the rates adopted in the applicant's traffic report, the rate of drop-off and pick-up will increase by approximately 50 movements in the peak 1 hour.***

- ***This will have a significant impact on the local area, particularly as the current School Traffic Management Plan is still not seen as operating at optimum performance. This is noted through a number of site visits, observations and local concerns raised whereby queueing has been seen to extend near to No. 224 Headland Road from the drop-off/pick-up bay on Tango Avenue.***
- ***The afternoon service appears to operate to a near satisfactory level, albeit the impact only occurs for approximately 15min in the afternoon and is therefore within tolerance levels.***

It is acknowledged that queuing beyond the capacity of the indented bay in Tango Avenue still occurs for a brief period in the afternoons, before 3:15pm, associated with the *Junior School* pick-up.

However, the extent of that *Junior School* queuing has been substantially reduced following implementation of the revised *School Traffic Management Plan* in 2019 which enabled 12 cars to pick-up simultaneously, with students called by name *before* their parent's/carer's car arrives at the designated car space in the indented bay.

The extent of that queuing has been further reduced in 2020 the introduction of a *third* staggered *Junior School* finishing time (i.e. for K to Year-2 at 2:55pm).

In any event, the queueing associated with the *Junior School* is not the subject of this application, and will not be affected by the proposed relocation of the *Senior School*.

Significantly, *Junior School* queuing is completely dissipated by about **3:15pm**, and ***does not coincide*** with *Middle School* (and currently, also with the *Senior School*) traffic activity which commences at ***3:20pm***.

Traffic activity generated by the *Middle School* (and currently, the *Senior School*) is much lower than *Junior School* traffic activity, and any queuing is minimal and is always *fully contained* within the existing indented bay in Tango Avenue. This is easily confirmed by site inspection after ***3:20pm*** on any afternoon.

A comparison of the peak hour traffic flows generated by the existing 303 *Senior School* students (to be relocated at 800 Pittwater Road) with the new 281 *Middle School* students that will replace them is set out below.

Whilst there are some variations from day-to-day, the analysis indicates that the proposed increase of 281 *Middle School* students will be largely offset by the relocation of the 303 *Senior School* students to the new campus, as set out in Table 1 below.

Table 1 - Nett Change in Drop-Offs & Pick-Ups in the Tango Avenue Indented Bay During the AM & PM School Peak Hours Vehicles per Hour (vph)

	Nett Increase in Middle School Drop-Offs & Pick-Ups		**Less Existing Senior School Drop-Offs & Pick-Ups to be Relocated**		***Nett Change* in Drop-Offs & Pick-Ups at 210 Headland Rd**	
	AM	**PM**	**AM**	**PM**	**AM**	**PM**
Monday	40 vph	10 vph	30 vph	8 vph	+10 vph	+2 vph
Tuesday	41 vph	6 vph	40 vph	10 vph	+1 vph	-2 vph
Wednesday	38 vph	12 vph	20 vph	9 vph	+18 vph	+3 vph
Thursday	32 vph	16 vph	35 vph	8 vph	-3 vph	+8 vph
Friday	31 vph	10 vph	32 vph	9 vph	-1 vph	+1 vph
Five Day Average	**36 vph**	**11 vph**	**31 vph**	**9 vph**	**+5 vph**	**-2 vph**

In summary, there will be no nett change in the level of traffic activity using the existing drop-off/pick-up indented bay in Tango Avenue, particularly after ***3:20pm*** (which is the subject of this application).

The existing *School Traffic Management Plan* will be retained and will continue to be developed and refined to manage the operation of traffic activity associated with the existing campus at 210 Headland Road.

A separate, new *School Traffic Management Plan* shall be developed to manage traffic on the proposed *Senior School* campus at 800 Pittwater Road.

- ***Confirmation of the number of parking spaces 'required' by students needs to be summarised in a table. It is unclear on what basis the applicant has determined 25 parking spaces to be sufficient for 600 senior students, particularly when public parking is minimal due to the location of the Senior Campus.***

- ***Whilst the Green Travel Plan appears to promote the use of public transport for students, it is stated that approximately 17% of the existing senior students will arrive by car however, it does not indicate the number of senior students parking, both on and off-street. Further clarification is required as this will determine whether the proposed 25 parking spaces for Senior Staff will be adequate on the new senior campus.***

The parking demands generated by self-drive Year-12 students is highly variable, comprising approximately 5% of students at the beginning of the Year-12 school year increasing to approximately 60% of students in the final weeks before the HSC exams as time pressures on Year-12 students become acute.

The median parking demand generated by Year-12 students is typically in the order of 40% of students and the off-street parking provisions are proposed to accommodate that demand in accordance with Council's DCP requirements as set out in Table 9 below.

Table 9 - Proposed Year-12 Off-Street Parking Provisions

210 Headland Road	Existing (To be Retained)	17 spaces
224 Headland Road	Proposed Sports Centre	39 spaces
800 Pittwater Road	Proposed Senior School Campus	25 spaces
TOTAL		**81 spaces**

ANNEXURE 2

Response to Submissions Raised by TfNSW

Vehicle Access to 800 Pittwater Road

1. <u>Comment</u>

The proposed development is likely to increase student movements along Harbord Street at a location where some of the right turning vehicles from Pittwater Road need to enter and exit the driveway located in close proximity to the Pittwater Road/Warringah Road/Harbord Road intersection. The following comments are made in relation to the proposed access arrangement to the school:

- ***The proposed activities associated with the development would likely to increase pedestrian / vehicle conflicts and cause pedestrian related incidents at the entrance to the school with the increase in pedestrian movements. and***

- ***The proposed school arrangement would have potential impact on the safety and operation efficiency of the Pittwater Road / Warringah Road signalised intersection as the proposed school activities such as off-street parking and pick up and drop off activities on site would likely to cause queuing onto Harbord Road, which results in immediate obstruction to the operation of the signalised intersection. As such, Transport for NSW does not support the vehicle access driveway from Harbord Road to the proposed development.***

<u>Recommendation</u>

It is requested that the Proponent:

- ***Investigates an alternate access to Harbord Road driveway within the closure of this access in consultation with TfNSW during the preparation of the applicant's response to submission.***

TfNSW's advice that it will not agree to a new entry/exit driveway off Pittwater Road as suggested by the Council is accepted.

A number of other options for providing access to the site have been investigated as indicated on the Traffic Access Plan prepared by *TZG Architects* however none of these options were feasible because:

- they required additional property acquisition and/or

- there were insurmountable geometric design problems, such as a height difference of 20m, which could only be resolved with lengthy ramping arrangements that would dominate the *Senior School* site, and

- the lengthy ramping arrangements would require the *demolition* of the existing building on the site. This would prevent adaptive reuse of the existing building as well as substantially reducing the floor area that would be available for educational purposes.

The existing vehicular access arrangements are therefore considered the most appropriate, given that:

- the existing driveway has been in use for many years, and caters for all vehicle sizes, including large 12.5m long HRV trucks and/or buses

- there will be a very substantial reduction in traffic flows using the existing driveway, from an average of 3,200 vehicles per day (vpd) at present to 640 vpd in the future.

Traffic Impact

2. <u>Comment</u>

The traffic report did not include supporting information to demonstrate that the pickup and drop-off activities on the proposed pickup and drop-off area will not have adverse impact on the adjacent road network. TfNSW is concerned that the vehicle queuing at the proposed pickup and drop-off area will overflow to Harbord Road, which results in obstruction at the signalised intersection.

<u>Recommendation</u>

The Proponent is requested to provide analysis and information to address the potential queuing issue at the proposed pickup and drop-off area.

An analysis of the drop-off and pick-up characteristics of the relocated *Senior School* has been undertaken at 5-minute intervals to determine the average number of cars that will be stopped to drop-off or pick-up *Senior School* students in each 5-minute period. The analysis is based on:

- projected future *Senior School* drop-off and pick-up demands illustrated on Figure 8 (Stage 2) and Figure 9 (Stage 3)

- a proposed drop-off/pick-up bay capacity of 7 cars in Stage 2, and 12 cars in Stage 3, (with queuing for a further 4 cars available in both stages *without* disrupting other traffic flows in/out of the site)

- a drop-off duration of 30 seconds per car in the morning and a pick-up duration of 70 seconds per car in the afternoon recorded at the existing indented bay in Tango Avenue

- an increase in existing enrolments from 303 students to 480 students proposed in Stage 2, and to 600 students proposed after completion of Stage 3 at the new campus.

The results of the *Senior School* drop-off and pick-up bay assessment are summarised in the graphs below, indicating that:

- the peak **drop-off** demand in **Stage 2** will be 1.6 cars, occurring at 8:15am (Figure 10)

- the peak **pick-up** demand in **Stage 2** will be 1.4 cars, occurring at 3:25pm (Figure 10)

- the peak **drop-off** demand in **Stage 3** will be 2 cars at 8:15am (Figure 11)

- the peak **pick-up** demand in **Stage 3** will be 1.9 cars at 3:25pm (Figure 11).

Figure 10 - Number of Cars Stopped to Drop-Off or Pick-Up: Senior School Students in Stage 2

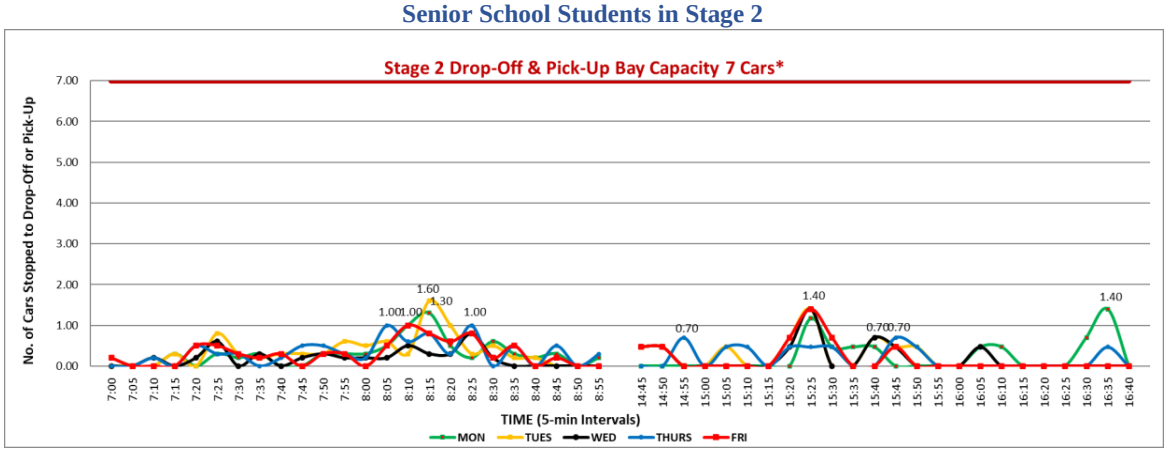
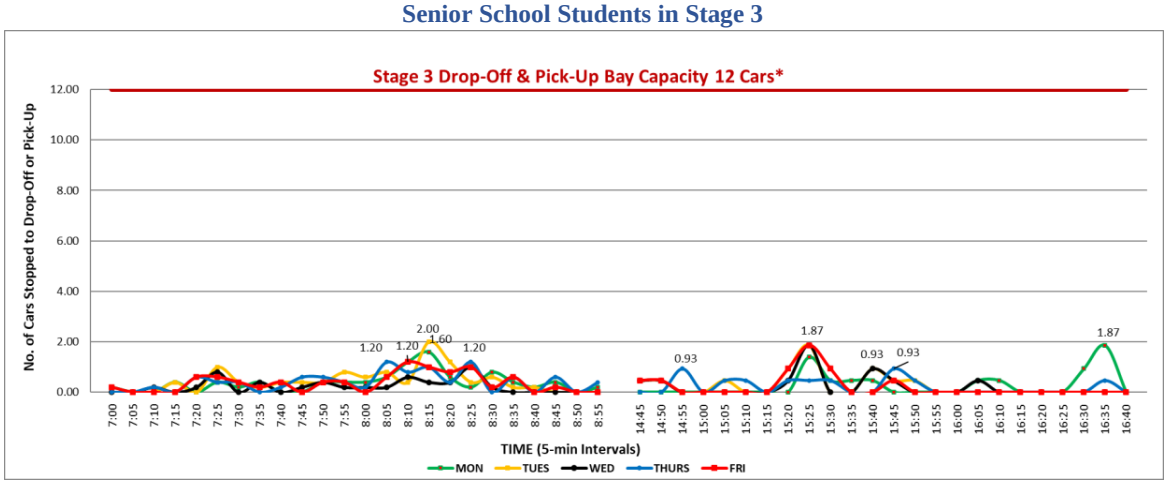


Figure 11 - Number of Cars Stopped to Drop-Off or Pick-Up: Senior School Students in Stage 3



The layout of the drop-off/pick-up bay proposed on the *Senior School* site in Stage 2 is illustrated on Figure 12 and makes provision for the following:

- a projected peak drop-off/pick-up demand of 1.6 cars and 1.4 cars respectively, shown in red
- a spare capacity of a further 5 cars in the drop-off/pick-up bay
- an overflow capacity of a further 4 cars on the driveway which can be accommodated ***without*** disrupting other traffic flows in or out of the site.

By way of comparison, the drop-off/pick-up bay proposed on the *Senior School* site in Stage 2 will have the *same capacity* as the school's existing indented bay in Tango Avenue but will cater for *less than one-third of the number of students*, noting also that those *Senior School* students will generate substantially less traffic activity than both the *Middle School* and *Junior School* students.

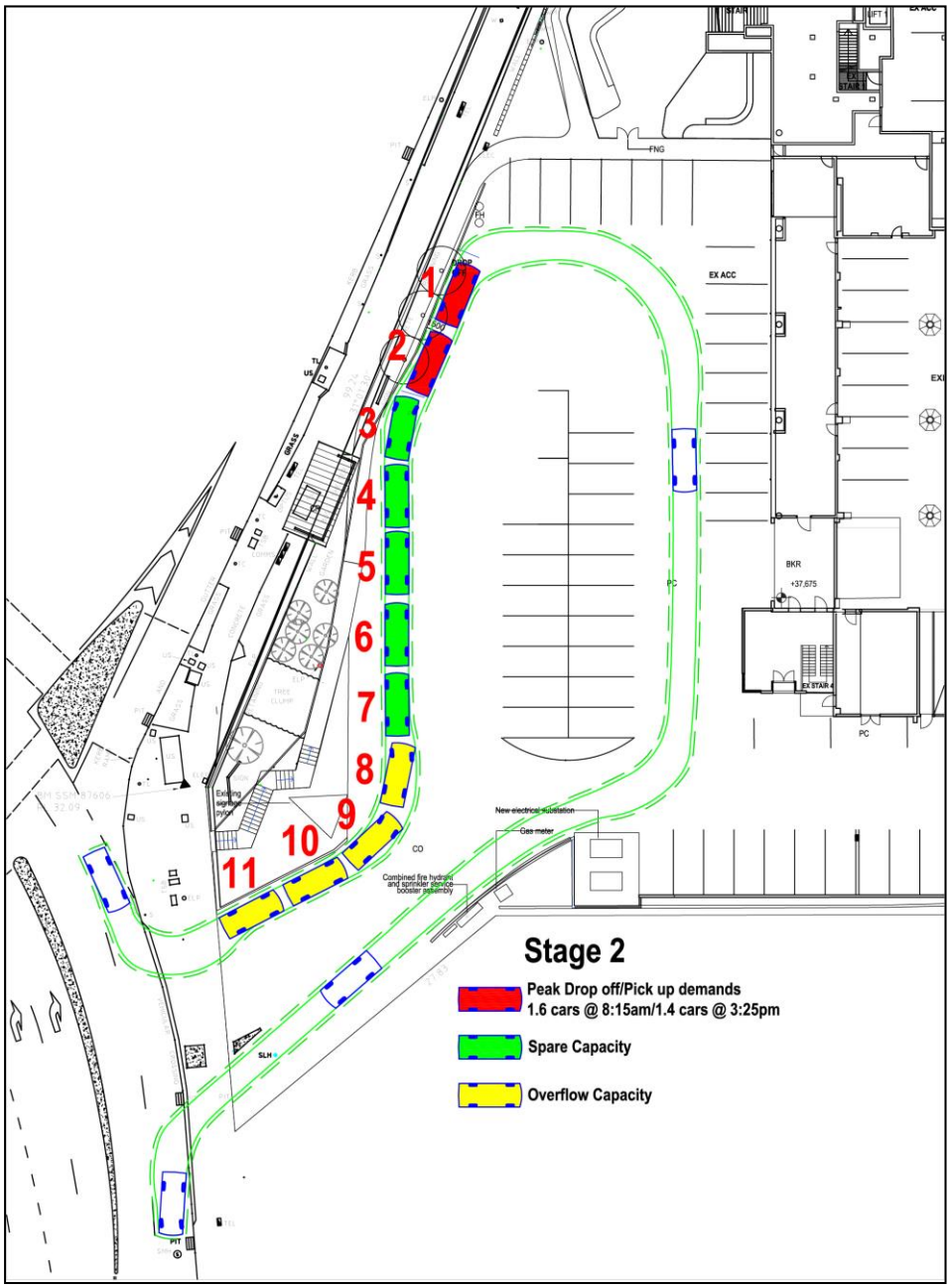


Figure 12 – Proposed Stage 2 *Senior School* Drop-Off/Pick-Up Bay

The layout of the drop-off/pick-up bay proposed on the *Senior School* site in Stage 3 is illustrated on Figure 13 and makes provision for the following:

- a projected peak drop-off/pick-up demand of 2.0 cars and 1.9 cars (rounded-up to 2 cars) respectively, shown in red

- a spare capacity of a further 5 cars in the drop-off/pick-up bay

- an overflow capacity of a further 4 cars on the driveway which can be accommodated ***without*** disrupting other traffic flows in or out of the site.

By way of comparison, the drop-off/pick-up bay proposed on the *Senior School* site in Stage 2 will have a *greater capacity* than the school's existing indented bay in Tango Avenue but will cater for approximately *half the number of students*, noting that those *Senior School* students will generate substantially less traffic activity than both the *Middle School* and *Junior School* students.

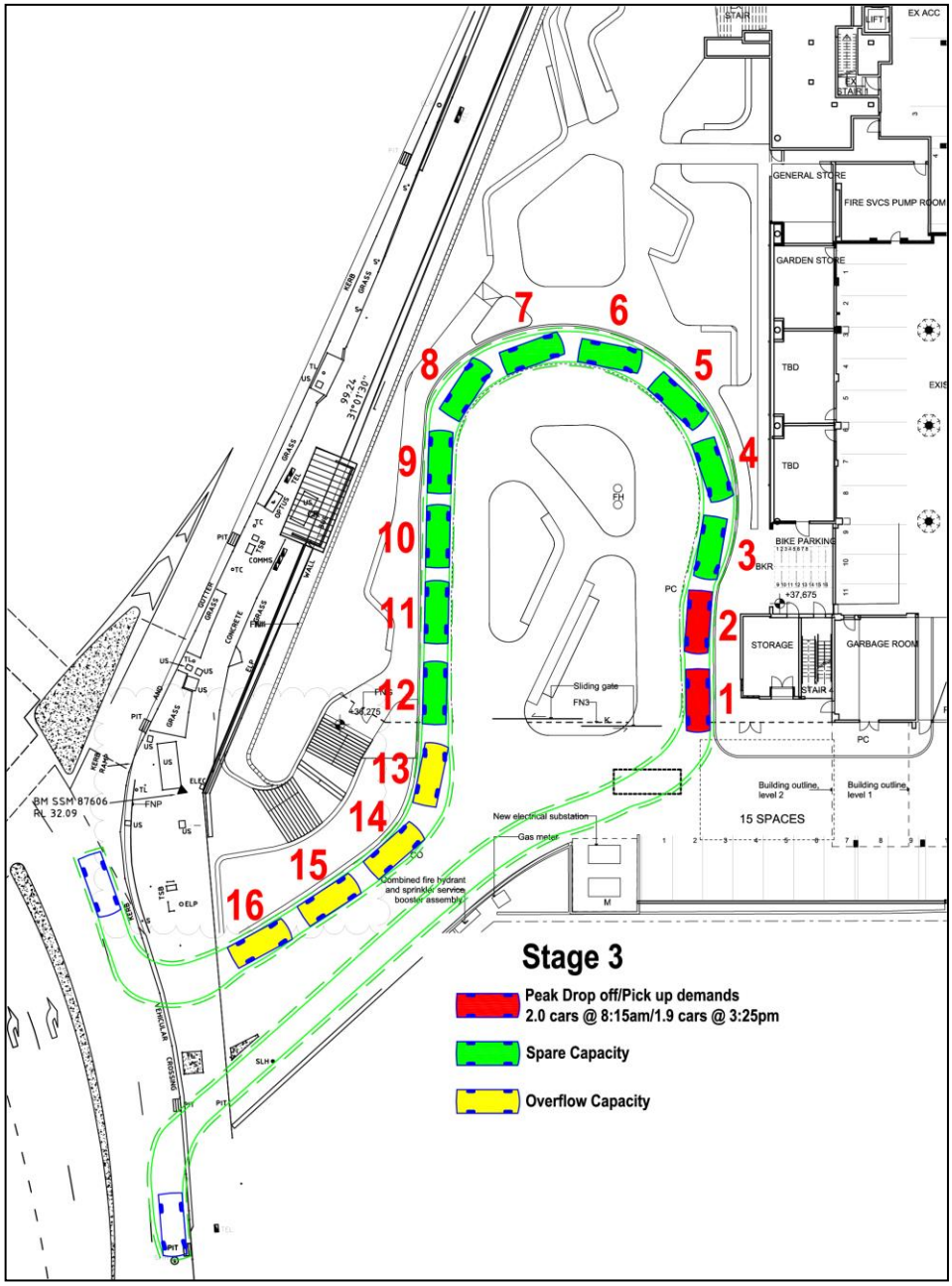


Figure 13 – Proposed Stage 3 *Senior School* Drop-Off/Pick-Up Bay

In summary, the analysis indicates that the maximum drop-off and pick-up demands can be *fully accommodated* by the drop-off/pick-up bays proposed within the 800 Pittwater Road site in Stages 2 & 3, with substantial spare capacity.

3. <u>Comment</u>

The traffic report did not include the assessment of existing and future travel demands.

<u>Recommendation</u>

The Proponent is requested to undertake further transport pattern survey for both staff and students to determine the future travel demands and the adequacy of existing and future transport infrastructure.

The results of the transport mode split surveys are summarised in the graphs below (Figures 1, 2 & 3), revealing that:

- approximately 92% of *Junior School* student are driven to/from school, noting that 57% of the students travelled with another student in the car

- the largest proportion of *Middle School* students, approximately 50%, travel to/from school by bus using either school buses or regular STA buses (the latter including the 132 bus and the new B-Line bus service)

- approximately 40% of *Middle School* students were driven to/from school, noting that 27% of the students travel with another student in the car

- the largest proportion of *Senior School* students, approximately 48%, travel to school by bus, using either school buses or regular STA bus services (including the 199 bus and the new B-Line service)

- approximately 35% of *Senior School* students are driven to/from school, noting that 22% of the students travelled with another student in the car.

In summary, the transport mode split survey results indicate that the proportion of students being driven to/from school decreases as their age increases, and that the proportion of students travelling by public transport or active transport (i.e. walking) increases as students get older. The results of the transport mode split surveys have been used to inform the Work Place Travel Plan, as detailed in **Annexure 4**.

Figure 1: Junior School Travel Mode

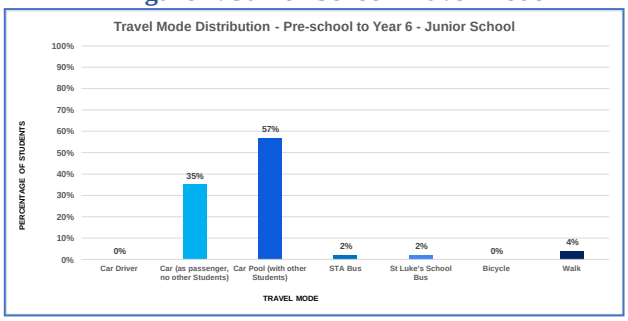


Figure 2: Middle School Travel Mode

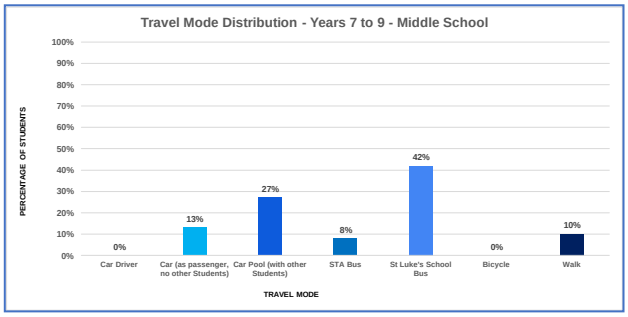
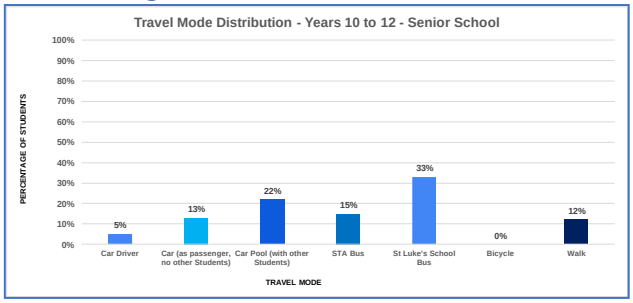


Figure 3: Senior School Travel Mode



4. Comment

The swept path diagrams in the traffic report indicate that the manoeuvre of a HRV encroaches the pickup and drop-off area. In particular during Stage 2, these pickup and drop-off spaces will be likely occupied by the vehicles associated with the Officeworks during off-peak period. This will potentially obstruct the vehicle movement on site and result in potential vehicles queuing back to Harbord Road.

Recommendation

The Proponent is requested to revised the design of the car parking area allowing manoeuvre of a HRV without any encroachment.

The existing parking area located in front of the building is *not used* by *Officeworks* trucks, and could not accommodate the swept turning path requirements of either MRV or HRV trucks in any event.

Trucks servicing the *Officeworks* loading dock currently make a 3-point turn using the end of the existing car park aisle, and then reverse back to the loading dock as illustrated on Figure 14.

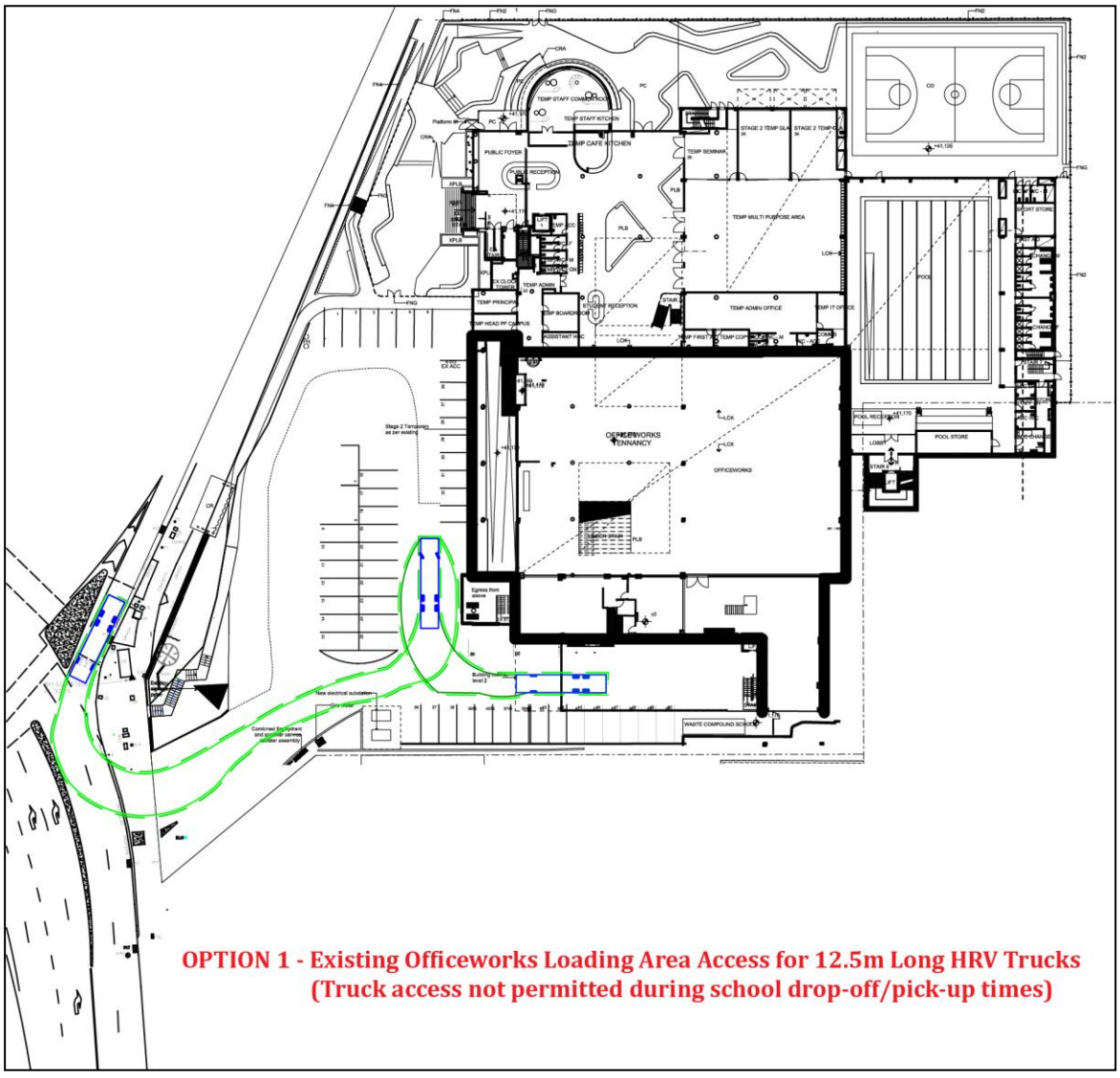


Figure 14 – Existing *Officeworks* Loading Area Access

The Stage 2 car parking area proposed in front of the building has been designed to accommodate the swept turning path requirements of HRV trucks (ie: large buses for school excursions), outside drop-off/pick-up times before/after school and could also be used by *Officeworks* as illustrated on Figure 15.

Parking for *Officeworks* will comprise 40 spaces in accordance with the *Officeworks* DA Consent Conditions. Parking spaces for *Officeworks* and *Senior School* uses will be clearly identified by the linemarkings and/or signposting. Parking in the drop-off/pick-up bay will not be permitted.

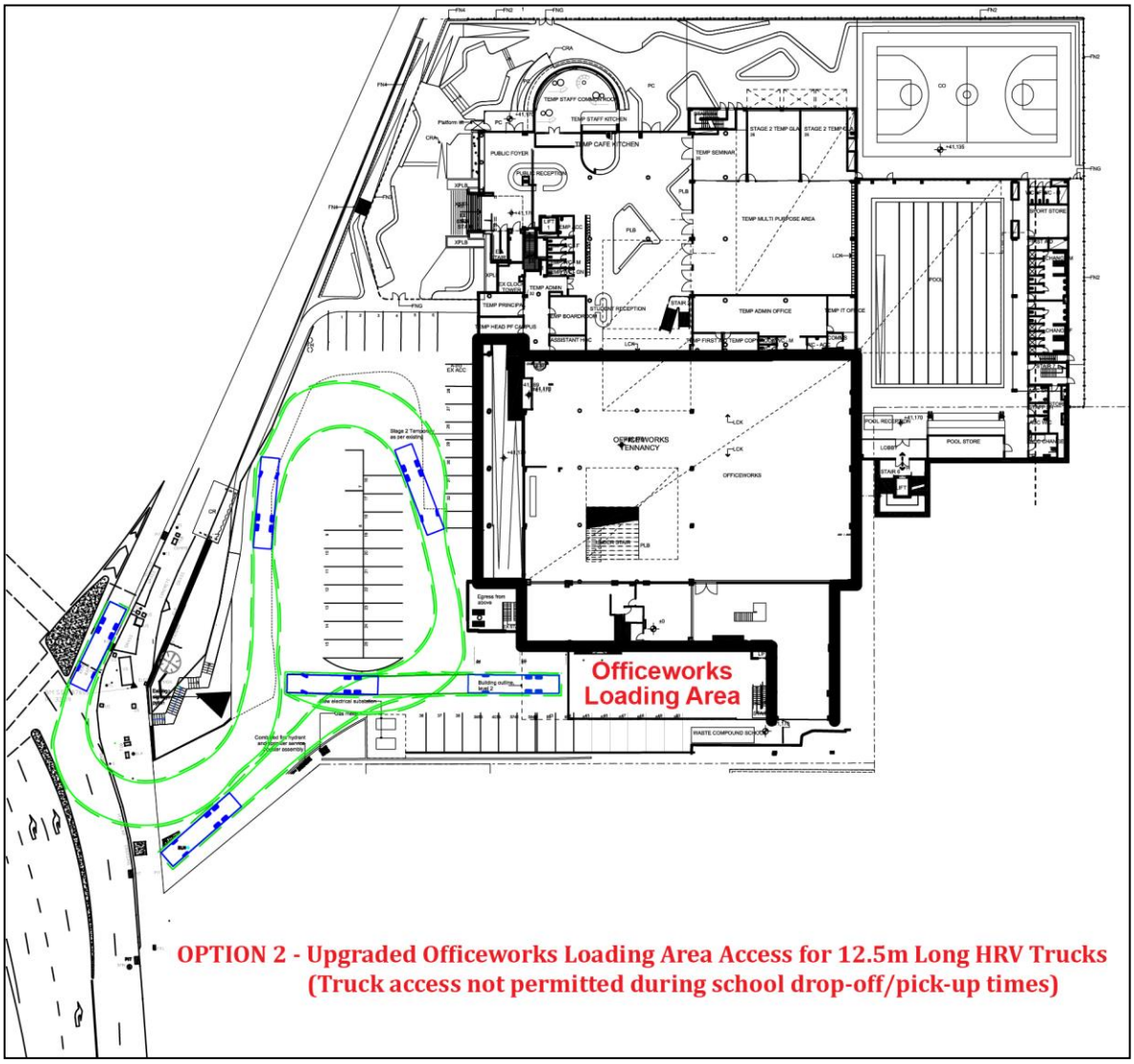


Figure 15 – Upgraded *Officeworks* Loading Area Access

Surveys conducted at the *Officeworks* loading dock over a period of 5 consecutive days between 6:30am-7:30pm have identified 2 heavy vehicle deliveries. Both of these heavy vehicle deliveries occurred between 9am-3pm when there will be little or no traffic activity generated by the school on the site. A number of other deliveries were made by smaller trucks, and the majority of those deliveries also occurred between 9am-3pm.

It is proposed to prepare a *Plan of Management* with *Officeworks* to ensure that no heavy vehicle deliveries occur during the peak drop-off/pick-up times of 7am-8:30am and 3:00pm-4:30pm on school days.

5. ***Comment***

The development proposes a total of 130 parking spaces on site. However no further analysis is provided to demonstrate that these parking supply will be adequate to accommodate the parking demand on each development stage.

Recommendation

The Proponent is requested to assess the impacts of cumulative parking demands including after school hours uses, as well as during Stage 2 when Officeworks is still in operation.

Parking in Stage 2 for *Officeworks* will be provided for 40 spaces in accordance with Council's development consent conditions (DA97/59).

Parking for the school uses proposed on the site is to be provided in accordance with Council's DCP parking requirements. This will result in the number of car parking spaces being reduced from an existing 182 spaces to 131 spaces in Stage 2 (whilst *Officeworks* remains on the site), and then down to 90 spaces when the *Senior School* campus is fully developed, as set out in Table 8 below.

Table 8 - Existing & Proposed Off-Street Parking
800 Pittwater Road

	Existing	**Stage 2**	**Stage 3**
Radiology Clinic	34 spaces*	n/a	n/a
Fitness First Gym	114 spaces*	n/a	n/a
Officeworks	40 spaces*	40 spaces*	n/a
School Staff	n/a	48 spaces	60 spaces
Visitors & Builders	n/a	28 spaces	5 spaces
Year 12 Students	n/a	15 spaces	25 spaces
TOTAL	**182 spaces**	**131 spaces**	**90 spaces**

* In accordance with DA Consent Conditions for each use

Traffic Modelling

6. ***Comment***

The traffic modelling results summarised in Table 3.1 and Table 3.2 of the Traffic and Parking Assessment Report (Traffic Report) show that the Pittwater Road/Warringah Road/Harbord Road will experience less vehicle delays with the introduction of 40km/h speed limit, which does not replicate the reality.

Recommendation

Further information and assumptions should be provided to support this claim.

The SIDRA traffic modelling indicates that the existing intersection currently operates at an average speed of 33.4 km/h in the AM school peak, and 33.3 km/h in the PM school peak.

Traffic modelling of the "proposed" traffic conditions (i.e. at the completion of Stage 3) indicates that the intersection will operate at 32.0 km/h during the AM school peak and 33.0 km/h during the afternoon school peak.

In essence, the traffic modelling shows that, *if* a 40 km/h school zone speed limit was applied, it would have little practical effect on the current operating performance of the intersection during the school peak periods, because it is already operating at *less than 40 km/h* in any event.

7. Comment

The parking survey results in the traffic report indicate that the traffic generation is intense and occurring in 15min peak periods during school time. However, the traffic generated by the proposed development is modelled in flat peak hour, which under-assess the impact of the pickup and drop-off activities on the adjacent road network.

Recommendation

The traffic model should be updated with appropriate peak hour factors. The SIDRA modelling files should be submitted to TfNSW for review.

The original traffic modelling was undertaken with a peak flow period of 30 minutes, and has now been updated to reflect a peak flow period of 15 minutes. The results of that analysis are summarised in Table 10 below.

Traffic Generation

8. Comment

The development is proposed to be completed in multiple stages. However, the traffic report only includes traffic generation estimation on the final stage when the development is completed. It is noted that the Stage 2 of the development may generate more vehicle traffic due to the remained trading of the Officeworks on site.

Recommendation

The Proponent should estimate trip generation of each development stage. And the impact of the traffic generation of each development stage should also be assessed in traffic modelling with the following scenarios:

- ***year 2019,***
- ***completion of Stage 1,***
- ***completion of Stage 2,***
- ***completion of Stage 3, and***
- ***10 years after completion of Stage 3.***

The traffic modelling has been updated to include a peak flow factor or 15 minutes as detailed above, and the updated results are summarised in Table 10 below.

Table 10 - Results of SIDRA Capacity Analysis
Pittwater Road and Harbord Road Intersection

	AM School Peak			PM School Peak		
	LoS	**AVD**	**DoS**	**LoS**	**AVD**	**DoS**
Existing Year 2019	D	47.5	0.835	D	52.8	0.805
Completion of Stage 1 (no change)	D	47.5	0.835	D	52.8	0.805
Completion of Stage 2	D	50.0	0.861	D	52.8	0.805
Completion of Stage 3	D	49.9	0.852	D	51.8	0.798

LoS: Level of Service; AVD: Average Vehicle Delays; DoS: Degree of Saturation

The results of the SIDRA capacity analysis confirm that the intersection will continue to operate at current levels of service under the projected future traffic demands, with no appreciable change in average vehicle delays.

As the intersection currently operates at or near capacity, there is no potential for growth in traffic flows during peak periods. Any increase in traffic flows through the intersection (eg. an increase in AADT volumes) would therefore occur outside peak periods, during business hours or after hours, when the *Senior School* will generate little, if any traffic, and all commercial traffic activity generated by the site is reduced (in Stage 2) or has ceased (in Stage 3).

In addition, it is likely that some *reductions* in traffic flows will occur on Pittwater Road in later years following the completion of the tunnel and upgrade of Wakehurst Parkway to dual carriageway. The *Northern Beaches Link*, the upgraded Wakehurst Parkway and the grade separated Wakehurst Parkway/Warringah Road intersection will then provide a superior alternative to the Pittwater Road route for traffic with an origin or destination outside the Northern Beaches LGA.

9. <u>Comment</u>

It is noted that the development proposes the allowance of community using the swimming pool and sports centre after school hours, which will also generate additional traffic during road network peak periods. However, the traffic report did not include the impact assessment of these additional traffic generated by the after school hour facilities.

<u>Recommendation</u>

The Proponent is requested to undertake traffic modelling with these additional traffic generated by the after school hour facilities. In order to assess the impact of the proposed development on Pittwater Road/Warringah Road/Harbord Road intersection during road network peak hours.

The traffic modelling included the arrival of the first swim-school class/community use during the afternoon *school peak* hour, comprising the arrival of approximately 42 vph for the first swim-school.

The after-hour swim-school will operate between 4pm-7pm and will comprise 3 classes of 1-hour duration each. Each class is expected to generate 84 vph (42 vph IN and 42 vph OUT).

That projected traffic activity expected to be generated by after-hours community users of the pool will be *substantially less than* the existing commercial uses of the site which typically generate in the order of 300 vph during the afternoon road network peak hour.

Community use of the basketball courts in the sports centre at 224 Headland Road is expected to comprise 10 persons per court. Based on a vehicle occupancy rate of 1.2 people/vehicle, the use of the sports centre is anticipated to generate approximately 33 vph between 4pm and 7pm.

Car parking

10. <u>Comment</u>

It is noted that the development involves the alteration of the existing car park. However, the assessment of the remaining car park layout and the alteration is not included in the traffic report.

<u>Recommendation</u>

The Proponent is requested to assess the layout of the proposed car parking areas associated with the subject development (including, driveways, grades, turn paths, sight distance requirements in relation to landscaping and/or fencing, aisle widths, aisle lengths, and parking bay dimensions) in accordance with AS 2890.1-2004, AS2890.6-2009 and AS 2890.2 – 2002 for heavy vehicle usage. The swept path of the longest vehicle (including garbage trucks, building maintenance vehicles and removalists) entering and exiting the subject site, as well as manoeuvrability through the site, shall be in accordance with AUSTROADS.

All changes to the existing car park layout have been designed to comply with all aspects of AS2890.1 – 2004, AS2890.2 – 2002 and AS2890.6 – 2009.

The swept turning path of the longest vehicle expected to access the site (a 12.5m long HRV garbage truck) is illustrated on Figure 16. Garbage collection will be restricted to after-hours only, consistent with the existing arrangements at the existing campus at 210 Headland Road.

It should be noted that truck access will not be permitted during drop-off/pick-up times and that deliveries and servicing of the site will be minimal, apart from garbage collection services.

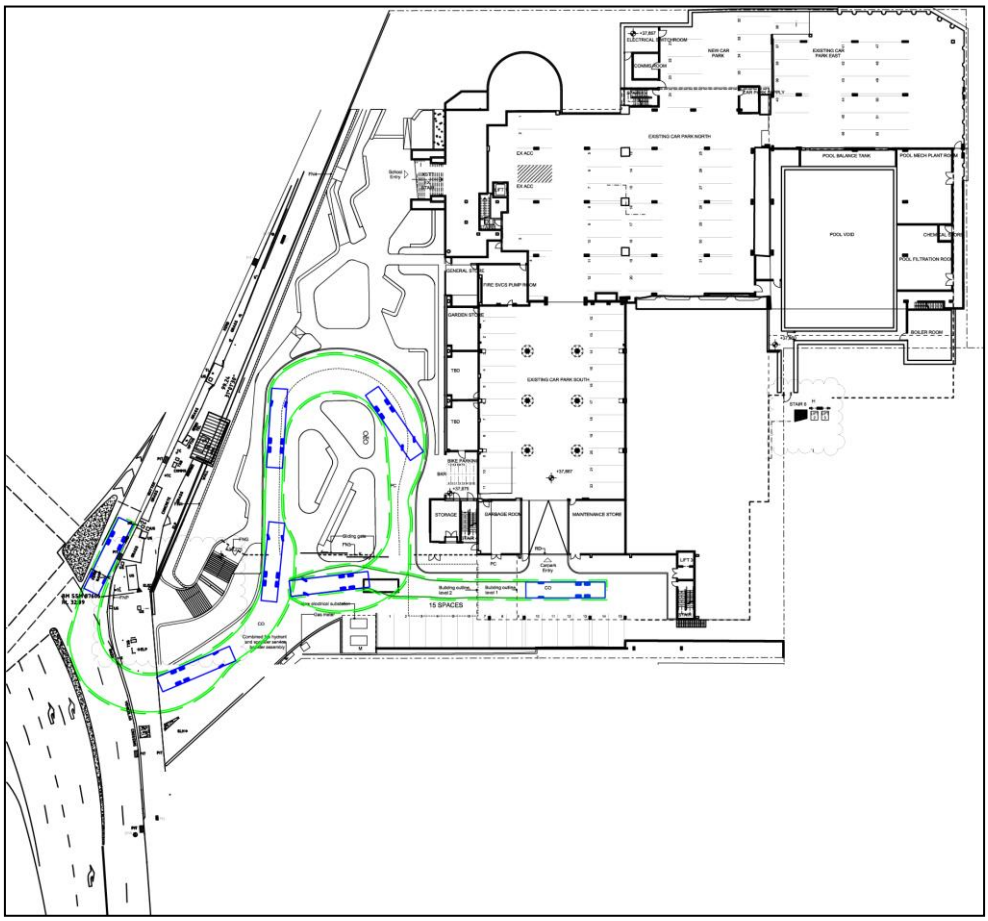


Figure 16 – Swept Turning Path of Longest Vehicle to Access the Site

Construction Pedestrian and Traffic Management

11. <u>Comment</u>

It is noted that the construction working hours are proposed from 7am-6pm Monday to Friday. Construction activities for the expansion of the school are expected to occur while students are on site during the operation of Stage 2. 12.5m HRVs would not be able to turnaround within the site and need to reverse out of the site during the construction and operation of Stages 2 and 3.

It is advised that construction vehicle movements from the development could have potential impact on general traffic and bus operations within the vicinity of the School, as well as the safety of pedestrians and cyclists particularly during school time and commuter peak periods.

It is noted that a preliminary Construction Traffic and Pedestrian Management Plan has been submitted, however greater detail is required to determine the likely impacts to the road network and public transport operation (if any).

<u>Recommendation</u>

It is requested that the applicant be conditioned to update the Construction Pedestrian and Traffic Management Plan (CPTMP) in consultation with TfNSW and submit a copy of the final CPTMP to the Principal Certifying Authority (PCA), prior to the issue of any construction certificate.

Both stages of construction have been designed to enable large 12.5m long HRV rigid trucks to turn around and exit the site in a forward direction as illustrated on Figures 17 & 18.

It is agreed that the applicant be conditioned to provide a CPTMP prior to the issue of any Construction Certificate, taking into account each stage of construction.

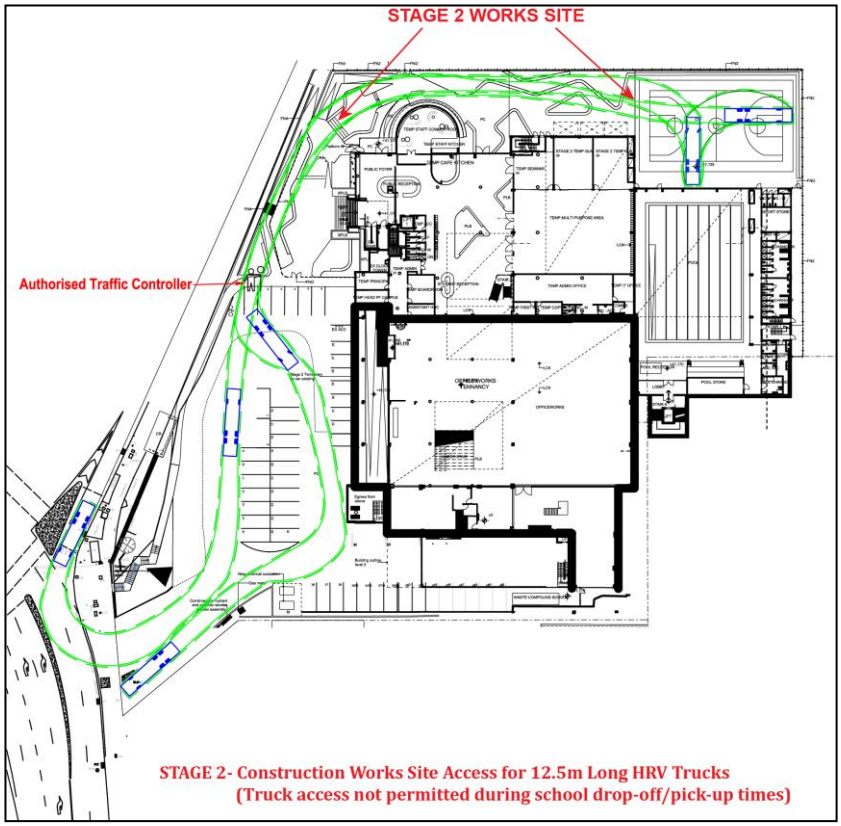


Figure 17 – Stage 2 Construction Access for 12.5m Long HRV Trucks

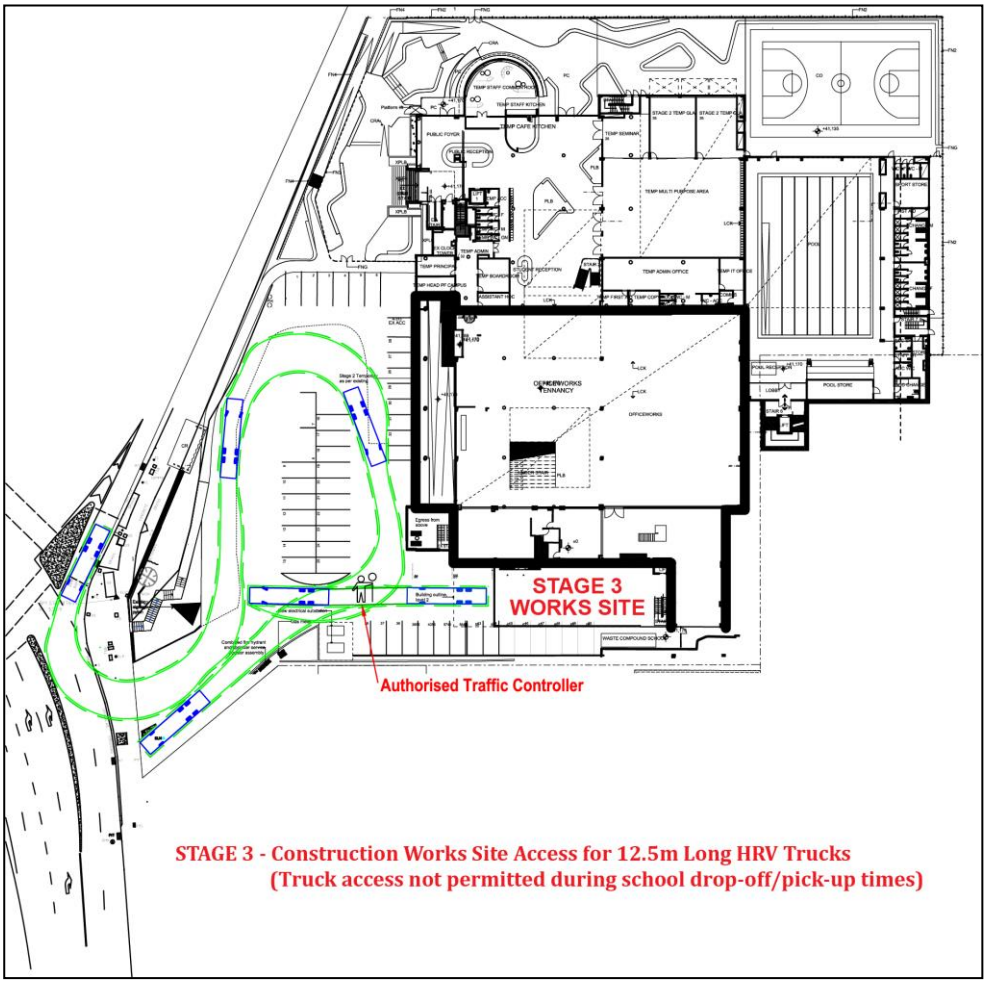


Figure 18 – Stage 3 Construction Access for 12.5m Long HRV Trucks

Green Travel Plan

12. <u>Comment</u>

It is noted that an overview of the Travel Plan for the development, which outlines actions and strategies that could be implemented to encourage staff, students and visitors to travel to the School using public and active transport has been provided as part of the development application.

<u>Recommendation</u>

It is requested the applicant be conditioned to update the Green Travel Plan in consultation with TfNSW and submit for endorsement of the PCA, at least six (6) months prior to the commencement of operation of the new school.

A Work Place Travel Plan for staff and students has been prepared (see Annexure 4).

Access to School Bus Services

13. <u>Comment</u>

School buses are expected to pick up and drop off students from Headland Rd and Quirk St school frontage.

<u>Recommendation</u>

It is requested that the applicant provide the details of condition and capability of the pedestrian path from the senior campus to Headland Road for senior students to access the school buses as part of the applicant's Response to Submissions.

The pedestrian footpath around the perimeter of the 210 Headland Road site has recently been widened and upgraded in accordance with Council's DA Consent Conditions (MOD2018/0412).

Additional improvements to the pedestrian link are also proposed between 210 Headland Road and 224 Headland Road in accordance with Council's DA Consent Conditions for works proposed at Units 3, 4 and 7 at No. 224 Headland Road (DA2019/0977).

These approved works will provide an upgraded pedestrian path between the *Senior School* and the school bus stops in Headland Road.

School Operational Management Plan

14. <u>Comment</u>

It is noted that pedestrian access on the south-west corner of the site at 800 Pittwater Road would lead to high number of students and parents waiting at the corner of a busy intersection with limited waiting area. This would have the potential for pedestrians to use travel lanes for waiting area and cause pedestrian related incidents.

It is advised that any direct pedestrian access onto multi-lane road should be avoided where possible. The existing north-west pedestrian access can still provide direct connection to the school entry from the protected pathway to Pittwater Road.
<u>Recommendation</u>

It is requested that the applicant be conditioned to prepare a School Operational Management Plan, in consultation with TfNSW, to manage student movements safely within and in the vicinity of the site and other transport related issues, prior to the issue of the occupation certificate.

It is agreed that a new *School Traffic Management Plan* shall be prepared for the *Senior School* campus. The new *School Traffic Management Plan* for the *Senior School* will include staff supervision at the drop-off/pick-up area and also at footpath area at the bottom of the stairs, near the site access driveway and the signalised pedestrian crossing.

A pedestrian fence is proposed along the kerb line from the termination of the existing pedestrian fence (north of the heritage bus shelter) to the existing driveway in Harbord Road, with a suitable gap in the pedestrian fence aligned with the signalised crossing.

In addition, the design of the new stairs proposed within the school site has been modified, with the stairs moved further back into the school site to create additional waiting areas for pedestrians at street level.

Arrival and departure of *Senior School* students is widely dispersed, with less distinctive peak periods than either the *Junior School* or the *Middle School*, because approximately 65% of students attend additional classes or activities "before" or "after" school.

Analysis of travel mode data suggests that approximately 190 *Senior School* students are likely to either walk to school, or walk to/from STA bus stops in Pittwater Road. Pedestrians walking to school are likely to use the following routes:

- east, towards the residential catchment area located east of the school, using the connection through the proposed Stage 1 *Sports Centre* to access Headland Road

- north, towards residential catchment areas and the B-Line bus stops located in Dee Why, via the existing pedestrian-only gate located at the north-western corner of the site to access Pittwater Road

- west, via the proposed new stairs, using the signalised pedestrian crossings to access the STA bus stops in Pittwater Road and the residential catchment areas located to the west and south-west of the site.

In terms of vehicle/pedestrian conflicts on the driveway there in Harbord Road will be few, if any, pedestrians using the new stairs with an origin/destination to the south in Harbord Road because the residential catchment in that area is very limited, with that precinct being dominated by industrial uses.

Thus, there will be few, if any pedestrians walking across the existing vehicular access driveway in Harbord Road.

This contrasts with the existing arrangement where students currently accessing the signalised pedestrian crossings and/or STA/B-Line bus services via the existing pedestrian path which links Headland Road and Harbord Road (located on the southern side of No. 267 Harbord Road) have *no alternative* but to walk along the footpath and across the existing driveway which is currently used by much higher volumes of traffic.

The travel mode surveys found that 27% of *Senior School* students walk to/from school or walk to/from STA bus stops in Pittwater Road and the WTP has targeted an increase to 32% or approximately 190 students.

The *Senior School* pedestrian movements will be widely dispersed, over a period of at least 1 hour, because a large proportion of students attend additional classes or activities "before" or "after" school.

If it is conservatively estimated that, say, approximately half of the 190 *Senior School* students will walk via the proposed new stairs to access the signalised pedestrian crossings, this equates to less than 5 pedestrians per cycle of the traffic signals at the Pittwater Road/Harbord Road intersection.

Whilst there will obviously be some variability in pedestrian numbers in each cycle of the traffic signals, it is nevertheless clear that the number of pedestrians that could be safely accommodated in the unusually wide footpath area located immediately adjacent to the existing signalised pedestrian crossings will substantially exceed actual demands.

As noted above the new *School Traffic Management Plan* for the *Senior School* will include staff supervision at the drop-off/pick-up area and also at footpath area at the bottom of the stairs, near the site access driveway and the signalised pedestrian crossing.

ANNEXURE 3

Response to Submissions Raised by DoPIE

- ***The Department notes that Transport for NSW (TfNSW) have raised concerns regarding the increase in pedestrian / vehicle conflicts associated with the Harbord Road driveway providing access to the senior school campus at 800 Pittwater Road. The Department agrees with the above concern. Noting the proposed change of use of the premises, the Department requires you to:***

  - ***investigate the feasibility of an alternative access point to the site, including the closure of the Harbord Road driveway. Or***

  - ***demonstrate that the existing driveway can operate safely in the future ameliorating the identified risks.***

TfNSW's advice that it will not agree to a new entry/exit driveway off Pittwater Road as suggested by the Council is accepted.

A number of other options for providing access to the site have been investigated as indicated on the Traffic Access Plan prepared by *TZG Architects* however none of these were feasible because:

- they required additional property acquisition and/or

- there were insurmountable geometric design problems, such as a height difference of 20m, which could only be resolved with lengthy ramping arrangements that would dominate the *Senior School* site, and

- the lengthy ramping arrangements would require the *partial demolition* of the existing building on the site. This would prevent adaptive reuse of the existing building as well as substantially reducing the area that would be available for educational purposes.

The existing vehicular access arrangements are therefore considered the most appropriate, given that:

- the existing driveway has been in use for many years, and caters for all vehicle sizes, including large 12.5m long HRV trucks and/or buses

- there will be a very substantial reduction in traffic flows using the existing driveway, from an average of 3,200 vpd at present to 640 vpd in the future.

In terms of vehicle/pedestrian conflicts on the driveway in Harbord Road there will be few, if any, pedestrians using the new *Senior School* stairs with an origin/destination to the south in Harbord Road because the residential catchment in that area is very limited, with that precinct being dominated by industrial uses.

Thus, there will be few, if any pedestrians walking along the footpath and across the existing vehicular access driveway in Harbord Road.

This contracts with the existing arrangement where students currently accessing the signalised pedestrian crossings and/or STA/B-Line bus services via the existing pedestrian path which links

Headland Road and Harbord Road (located on the southern side of No. 267 Harbord Road) have no alternative but to walk along the footpath and across the existing driveway which is currently used by much higher volumes of traffic.

The travel mode surveys found that 27% of *Senior School* students walk to/from school or walk to/from STA bus stops in Pittwater Road and the WTP has targeted an increase to 32% or approximately 190 of the proposed 600 *Senior School* students.

The *Senior School* pedestrian movements will be widely dispersed, over a period of at least 1 hour, because a large proportion of students attend additional classes or activities "before" or "after" school.

If it is conservatively estimated that, say, approximately half of the 190 *Senior School* students will walk via the proposed new stairs to access the signalised pedestrian crossings, this equates to less than 5 *Senior School* pedestrians per cycle of the traffic signals at the Pittwater Road/Harbord Road intersection.

Whilst there will obviously be some variability in pedestrian numbers in each cycle of the traffic signals, it is nevertheless clear that the number of pedestrians which could be safely accommodated in the unusually wide footpath area located immediately adjacent to the existing signalised pedestrian crossings will substantially exceed actual demands.

In addition, the design of the new stairs proposed within the school site has been modified, with the stairs moved further back into the school site to create additional waiting areas for pedestrians at street level.

A pedestrian fence is also proposed along the kerb line from the termination of the existing pedestrian fence (north of the heritage bus shelter) to the existing driveway in Harbord Road, with a suitable gap in the pedestrian fence aligned with the signalised crossing.

It is agreed that a separate new *School Traffic Management Plan* shall be prepared for the *Senior School* campus. The new *School Traffic Management Plan* for the *Senior School* will include staff supervision at the drop-off/pick-up area and also at footpath area at the bottom of the stairs, near the signalised pedestrian crossing.

- ***Provide further clarification regarding the information provided in the submitted traffic report including:***

  - ***analysis and information to address the potential impacts due to queuing of vehicles utilising the proposed pick-up and drop-off areas.***

An analysis of the drop-off and pick-up characteristics of the relocated *Senior School* has been undertaken at 5-minute intervals to determine the average number of cars that will be stopped to drop-off or pick-up *Senior School* students in each 5-minute period. The analysis is based on:

- projected future *Senior School* drop-off and pick-up demands illustrated on Figure 8 (Stage 2) and Figure 9 (Stage 3)

- a proposed *Senior School* drop-off/pick-up bay capacity of 7 cars in Stage 2, and a capacity of 12 cars in Stage 3, (with queuing for a further 4 cars available in both stages *without* disrupting other traffic flows in/out of the site)

- a drop-off duration of 30 seconds per car in the morning and a pick-up duration of 70 seconds per car in the afternoon recorded at the existing indented bay in Tango Avenue

- an increase in existing enrolments from 303 students to 480 students proposed in Stage 2, and to 600 students proposed after completion of Stage 3 at the new campus.

The results of the *Senior School* drop-off and pick-up bay assessment are summarised in the graphs below, indicating that:

- the peak **drop-off** demand in **Stage 2** will be 1.6 cars, occurring at 8:15am (Figure 10)
- the peak **pick-up** demand in **Stage 2** will be 1.4 cars, occurring at 3:25pm (Figure 10)
- the peak **drop-off** demand in **Stage 3** will be 2.0 cars at 8:15am (Figure 11)
- the peak **pick-up** demand in **Stage 3** will be 1.9 cars at 3:25pm (Figure 11)
- the drop-off and pick-up activity generated by the *Senior School* is widely and more evenly dispersed over a period of more than an hour, with less distinctive "peaks" than either the *Junior School* or *Middle School*

Figure 10 - Number of Cars Stopped to Drop-Off or Pick-Up: Senior School Students in Stage 2

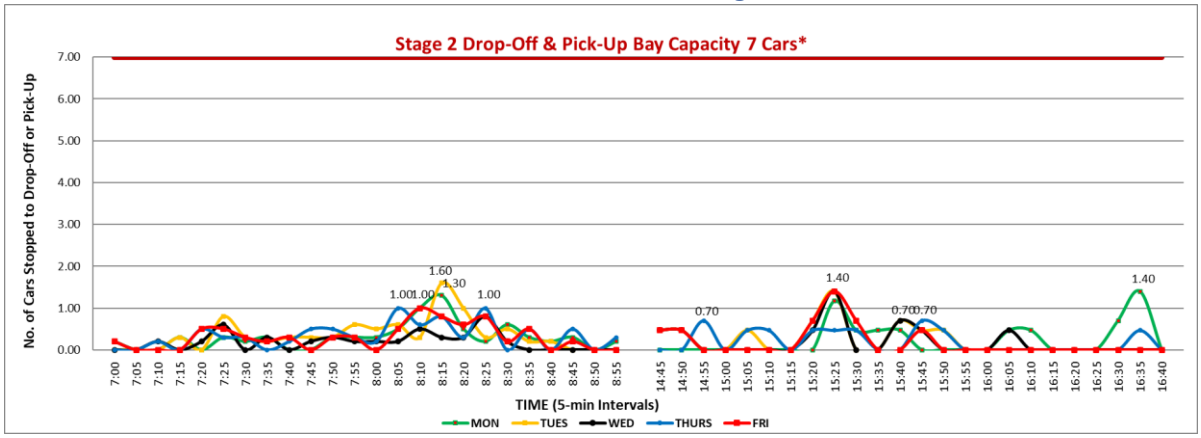
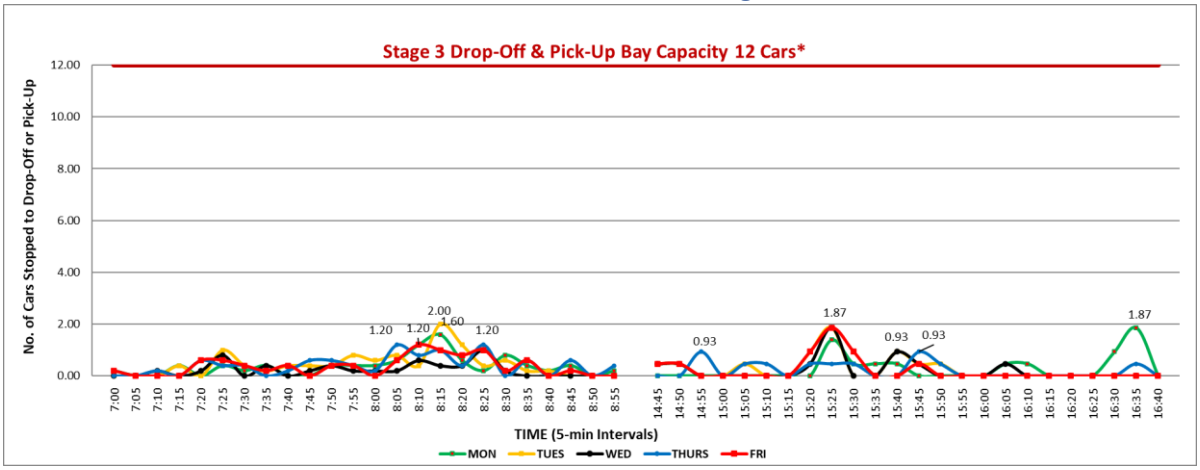


Figure 11 - Number of Cars Stopped to Drop-Off or Pick-Up: Senior School Students in Stage 3



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The layout of the drop-off/pick-up bay proposed on the *Senior School* site in Stage 2 is illustrated on Figure 12 and makes provision for the following:

- a projected peak drop-off/pick-up demand of 1.6 cars and 1.4 cars respectively (rounded-up to 2 cars), shown in red

- a spare capacity of a further 5 cars in the drop-off/pick-up bay

- an overflow capacity of a further 4 cars on the driveway which can be accommodated ***without*** disrupting other traffic flows in or out of the site.

By way of comparison, the drop-off/pick-up bay proposed on the *Senior School* site in Stage 2 will have the *same capacity* as the school's existing indented bay in Tango Avenue but will cater for *less than one-third of the number of students*, noting that those *Senior School* students will generate substantially less traffic activity than both the *Middle School* and *Junior School* students.

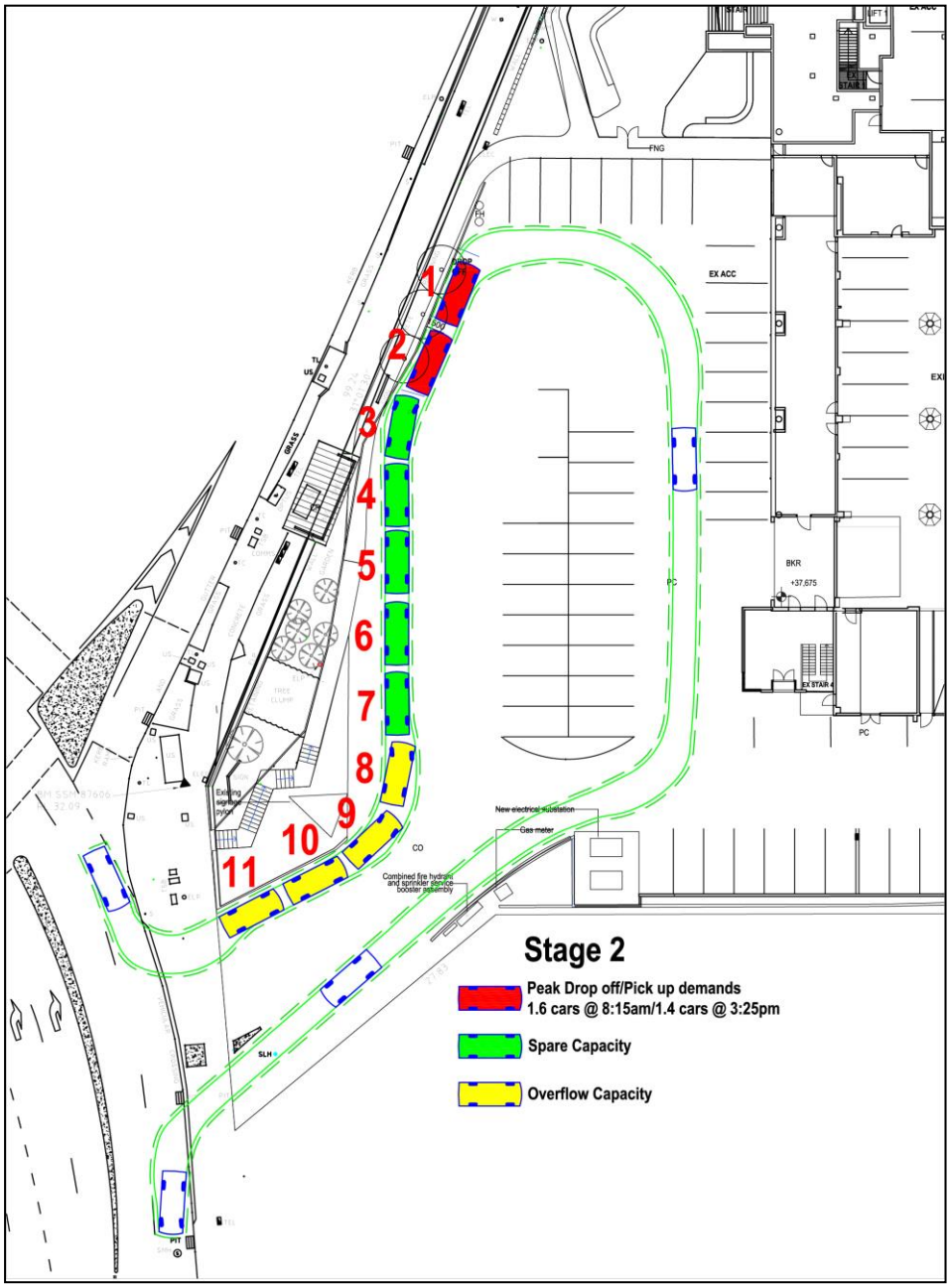

Figure 12 – Proposed Stage 2 *Senior School* Drop-Off/Pick-Up Bay

The layout of the drop-off/pick-up bay proposed on the *Senior School* site in Stage 3 is illustrated on Figure 13 and makes provision for the following:

- a projected peak drop-off/pick-up demand of 2.0 cars and 1.9 cars respectively (rounded-up to 2 cars), shown in red

- a spare capacity of a further 5 cars in the drop-off/pick-up bay

- an overflow capacity of a further 4 cars on the driveway which can be accommodated ***without*** disrupting other traffic flows in or out of the site.

By way of comparison, the drop-off/pick-up bay proposed on the *Senior School* site in Stage 2 will have *a greater capacity* than the school's existing indented bay in Tango Avenue but will cater for *less than one-third of the number of students*, noting that those *Senior School* students will generate substantially less traffic activity than both the *Middle School* and *Junior School* students.

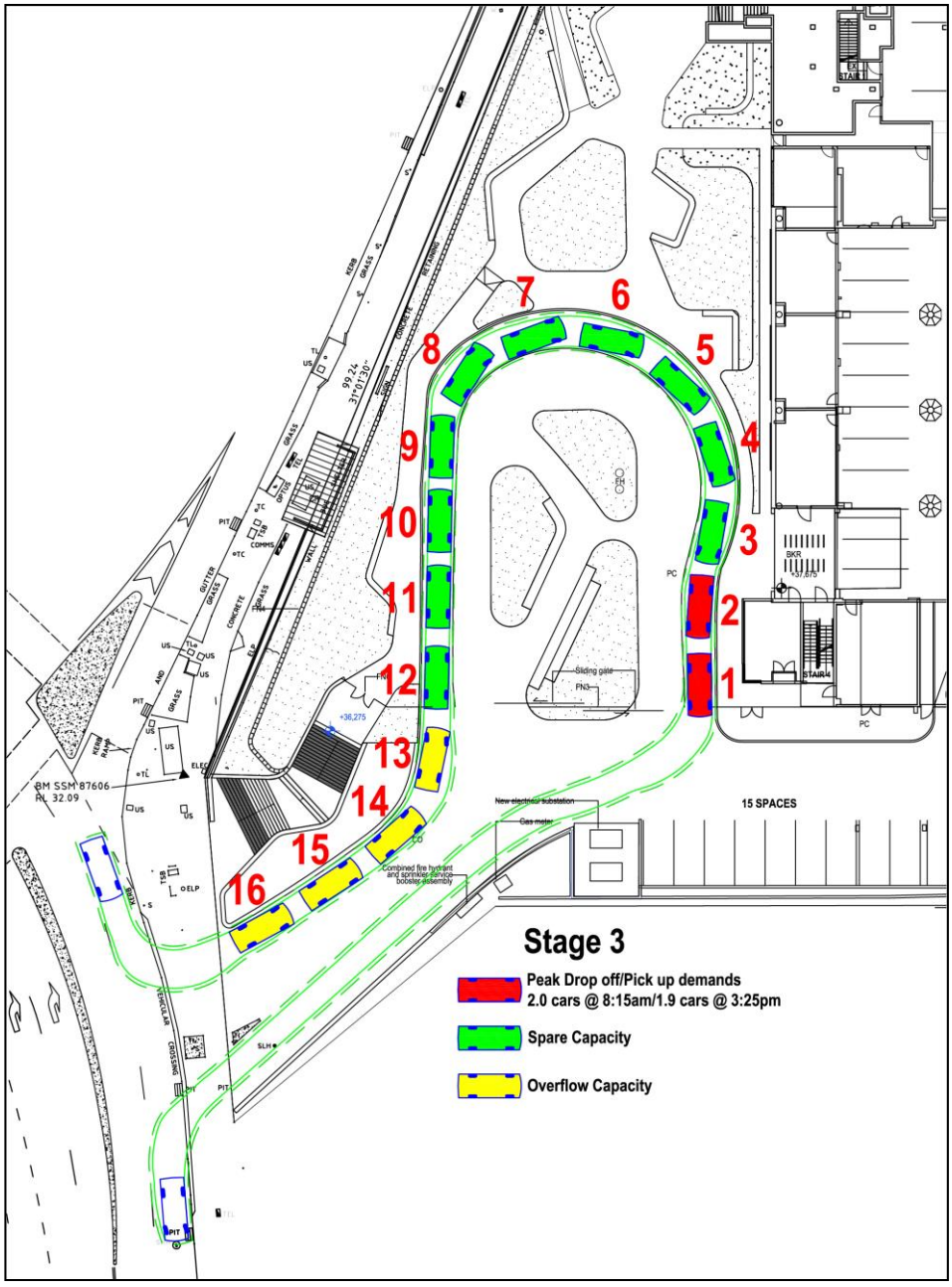

Figure 13 – Proposed Stage 3 *Senior School* Drop-Off/Pick-Up Bay

In summary, the drop-off and pick-up demands can be *fully accommodated* by the drop-off/pick-up bays proposed within the 800 Pittwater Road site in Stages 2 & 3, with substantial spare capacity.

- ***further reasons and / or analysis to justify that the impacts on the local traffic network would reduce as a result of the proposed change of use to a school.***

A detailed analysis demonstrating the reduced traffic flows expected to be generated by the site is provided in the introduction to this report.

In summary, the analysis indicates that here will be a very substantial reduction in the level of traffic activity generated by the 800 Pittwater Road site following its conversion from *commercial uses* to a *Senior School* campus, from approximately 3,224 vpd to 644 vph, a reduction of 2,580 vpd, as set out in Table 4 below.

Table 4 - Nett Reduction in Traffic Flows
As a Consequence of the Proposed Senior School at 800 Pittwater Road
Vehicles Per Day (vpd)

	In	Out	Total
Existing Commercial Uses	1,603 vpd	1,621 vpd	3,224 vpd
Proposed Senior School Campus	322 vpd	322 vpd	644 vpd
Nett Reduction	**-1,281 vpd**	**-1,299 vpd**	**-2,580 vpd**

The results of the analysis also indicate that the change of use proposed at 800 Pittwater Road from *commercial uses* to a *Senior School* campus will result in a reduction in traffic flows generated during the *"school peak"* hours (i.e. 7:30am-8:30am and 3:20pm-4:20pm) of approximately 2 vph and 116 vph respectively, as set out in Table 7 below.

Table 7 - Nett Reduction in Traffic Flows
As a Consequence of the Proposed Senior School at 800 Pittwater Road
Vehicles Per Hour (vph)

	AM School Peak Hour			PM School Peak Hour		
	In	Out	Total	In	Out	Total
Existing Commercial Uses	99 vph	91 vph	190 vph	133 vph	118 vph	251 vph
Proposed Senior School Campus	125 vph	63 vph	188 vph	59 vph	77 vph	135 vph
Nett Reduction	**-26 vph**	**-28 vph**	**-2 vph**	**-74 vhp**	**-44 vph**	**-116 vph**

- ***an updated traffic modelling with appropriate peak hour factors as requested by TfNSW.***

Upgraded SIDRA traffic modelling has been undertaken with appropriate peak hour factors as detailed in the TfNSW RTS.

- ***an assessment of the impacts of cumulative parking demands, including after school hours uses, as well as during the proposed Stage 2 operations which would concurrently occur with the commercial use at 800 Pittwater Road.***

Parking for the school uses proposed on the site is to be provided in accordance with Council's DCP parking requirements. This will result in the number of car parking spaces being reduced from an existing 182 spaces to 131 spaces in Stage 2 (whilst *Officeworks* remains on the site), and then down to 90 spaces when the *Senior School* campus is fully developed, as set out in Table 8 below.

Table 8 - Existing & Proposed Off-Street Parking
800 Pittwater Road

	Existing	Stage 2	Stage 3
Radiology Clinic	34 spaces*	n/a	n/a
Fitness First Gym	114 spaces*	n/a	n/a
Officeworks	40 spaces*	40 spaces*	n/a
School Staff	n/a	48 spaces	60 spaces
Visitors & Builders	n/a	28 spaces	5 spaces
Year 12 Students	n/a	15 spaces	25 spaces
TOTAL	**182 spaces**	**131 spaces**	**90 spaces**

* In accordance with DA Consent Conditions for each use

- ***estimates of trip generation of each development stage***

- ***an assessment of the proposed traffic impact on the existing junior campus at 210 Headland Road, caused by the change in the current student mix between the senior and junior campuses (i.e. increase of primary school students in the existing campus).***

A detailed assessment of the change in traffic activity at 210 Headland Road is provided in the Council RTS.

The increase of 281 additional *Middle School* students at 210 Headland Road will be largely offset by the relocation of the existing 303 *Senior School* students to the new campus at 800 Pittwater Road as set out in Table 1 below.

Table 1 - Nett Change in Drop-Offs & Pick-Ups in the Tango Avenue Indented Bay
During the AM & PM School Peak Hours
Vehicles per Hour (vph)

	Nett Increase in Middle School Drop-Offs & Pick-Ups		Less Existing Senior School Drop-Offs & Pick-Ups to be Relocated		*Nett Change* in Drop-Offs & Pick-Ups at 210 Headland Rd	
	AM	PM	AM	PM	AM	PM
Monday	40 vph	10 vph	30 vph	8 vph	+10 vph	+2 vph
Tuesday	41 vph	6 vph	40 vph	10 vph	+1 vph	-2 vph
Wednesday	38 vph	12 vph	20 vph	9 vph	+18 vph	+3 vph
Thursday	32 vph	16 vph	35 vph	8 vph	-3 vph	+8 vph
Friday	31 vph	10 vph	32 vph	9 vph	-1 vph	+1 vph
Five Day Average	**36 vph**	**11 vph**	**31 vph**	**9 vph**	**+5 vph**	**-2 vph**

In summary, there will be no nett change in the level of traffic activity using the existing drop-off/pick-up bay in Tango Avenue as a consequence of the change in student mix.

- ***The submitted Green Travel Plan (GTP) shows that about 94% of the staff currently utilise private vehicles for commuting to the school. It is anticipated that this would reduce to 90% in the future, upon implementation of the GTP. However, the Department considers that the 90% target comprises a very high percentage of private vehicle usage. Consequently, a Workplace Travel Plan (WTP) needs to be prepared and submitted with the RTS. The WTP must provide a description of the meaningful details or incentives to encourage the use of more sustainable travel modes. The WRP should include:***

  - ***objectives and targets (i.e. site-specific, measurable, achievable and timeframes for implementation) to define the direction and purpose of the WTP.***

  - ***actions to help achieve the objectives.***

  - ***measures to promote and support the implementation of the plan.***

  - ***a process for monitoring and review of the WTP at regular intervals.***

A WTP is attached to this submission.

- ***Further clarification should be provided regarding the function of the current School Traffic Management Plan (STMP) in achieving the proposed targets within the GTP.***

The purpose of the *School Traffic Management Plan* is to manage the day-to-day traffic activity associated with drop-offs and pick-ups by both cars and school buses. The day-to-day traffic operations are intensively managed by a large number of school staff to minimise traffic delays during the morning drop-off and more importantly during afternoon pick-up.

The STMP has been developed and refined over a period of several years, with the most recent change being the introduction of a third staggered finishing time for the *Junior School* in 2019. The STMP has been highly successful in reducing delays, with queues at the 210 Headland Road site having been eliminated at all times except for a brief period before 3:15pm associated with the *Junior School* pick-up. The operation of the STMP is not related to the GTP or the WTP.

- ***A further transport pattern survey for both staff and students should be conducted to determine the future travel demands and the adequacy of existing and future transport infrastructure. The results of this survey should be incorporated, as appropriate, into any amendments to the STMP and Green Travel Plan as well as the WTP.***

A detailed transport mode survey for both staff and students has been undertaken as detailed in the attached WTP.

Further evidence should be provided to adequately demonstrate:

- ***that a heavy rigid vehicle can adequately manoeuvre within the car parking areas, to ensure potential conflicts between construction vehicles associated with the development of St Luke's College Senior Campus and operational vehicles which may be associated with the operation of the St Luke's Senior Campus and adjacent commercial uses are minimised.***

It is anticipated that a construction works compound will be established around the northern part of the existing building during Stage 2. This will require construction vehicles to proceed between the site access driveway in Harbord Road and the construction works compound through the car parking area located in front of the existing building.

Swept turning path analysis prepared in accordance with AS2890.2 confirms that large 12.5m long HRV rigid trucks will be able to safely traverse the car parking area as illustrated on Figure 17.

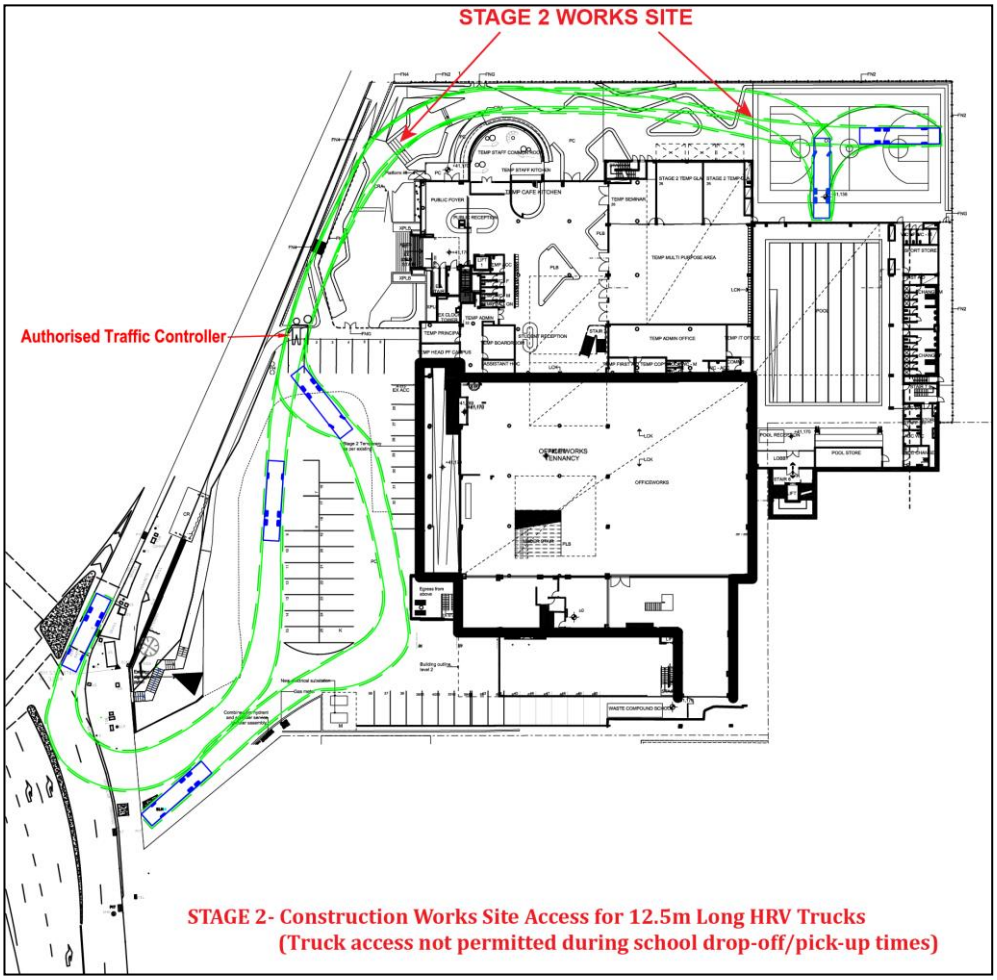

Figure 17 – Stage 2 Construction Access for 12.5m Long HRV Trucks

All construction vehicle movements through the car parking area will be ***supervised by authorised traffic controllers*** as part of a detailed *Construction, Pedestrian and Traffic Management Plan* (CPTMP) which shall be prepared prior to the issue of any Construction Certificate, taking into account each stage of construction.

- ***that 25 parking spaces within the site at 800 Pittwater Road are sufficient to cater for 600 senior students, given that there are limited opportunities to park on the nearby streets.***

The parking demands generated by self-drive Year-12 students is highly variable, comprising approximately 5% of students at the beginning of the Year-12 school year increasing to approximately 60% of students in the final weeks of the Year-12 school year as time pressures on Year-12 students become acute before the HSC exams.

The median parking demand generated by Year-12 students is typically in the order of 40% of students and the off-street parking provisions are proposed to accommodate that demand in accordance with Council's DCP requirements as set out in Table 9 below.

Table 9 - Proposed Year-12 Off-Street Parking Provisions

210 Headland Road	Existing (To be Retained)	17 spaces
224 Headland Road	Proposed Sports Centre	39 spaces
800 Pittwater Road	Proposed Senior School Campus	25 spaces
TOTAL		**81 spaces**