Traffic Impact Assessment

SCEGGS Darlinghurst
Proposed Redevelopment

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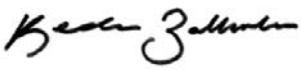
v06	10-01-2019	Neil Caga	Kedar Ballurkar	

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Appendices

1. Introduction

TRAFFIX has been commissioned by SCEGGS Darlinghurst to undertake a Traffic Impact Assessment (TIA) of a redevelopment of the SCEGGS Darlinghurst School at 215 Forbes Street, Darlinghurst. A State Significant Development (SSD) Application seeks approval for the Concept Masterplan, as well as Stage 1 approval to proceed with the redevelopment of Wilkinson House.

The development is located within the City of Sydney local government area and has been assessed under that Council's controls, as well as having regard for relevant matters raised in the Secretary's Environmental Assessment Requirements (SEARs).

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Presents a preliminary Green Travel Plan
- Section 8: Discusses access and internal design aspects
- Section 9: Presents a preliminary Construction Traffic Management Plan
- Section 10: Addresses each SEARs requirement
- Section 11: Presents the overall study conclusions

2. Location and Site

SCEGGS Darlinghurst is located at 165-215 Forbes Street in Darlinghurst, approximately 400 metres southwest of Kings Cross Railway Station. More specifically, it is situated on the southern side of St Peters Street and bounded by the area between Forbes Street and Bourke Street.

The site is irregular shaped in configuration with a total area of 13,676.2m^2. It has a northern frontage to St Peters Street of approximately 62 metres in length, and a southern boundary to neighbouring residential properties of approximately 86 metres in length. The eastern frontage to Forbes Street and western frontage to Bourke Street measure approximately 133 metres and 84 metres in length, respectively.

The site is presently served by four (4) existing vehicular accesses, comprising of two (2) driveways off Forbes Street, one (1) driveway off Bourke Street and one (1) driveway off St Peters Street. The SCEGGS Darlinghurst School is partitioned between a primary school (Kindergarten to Year 6) and the secondary school (Year 7 to Year 12). The main pedestrian access for the primary school component is accommodated onto Bourke Street, while the secondary school component mainly utilizes pedestrian accesses on Forbes Street and St Peters Street. It is noted that St Peters Street is typically only open during the AM and PM peak periods, with a remote operated gate closed at both ends during other times.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**. Reference should also be made to the Photographic Record presented in **Appendix A**, which provides an appreciation of the general character of roads and other key attributes in proximity to the site.

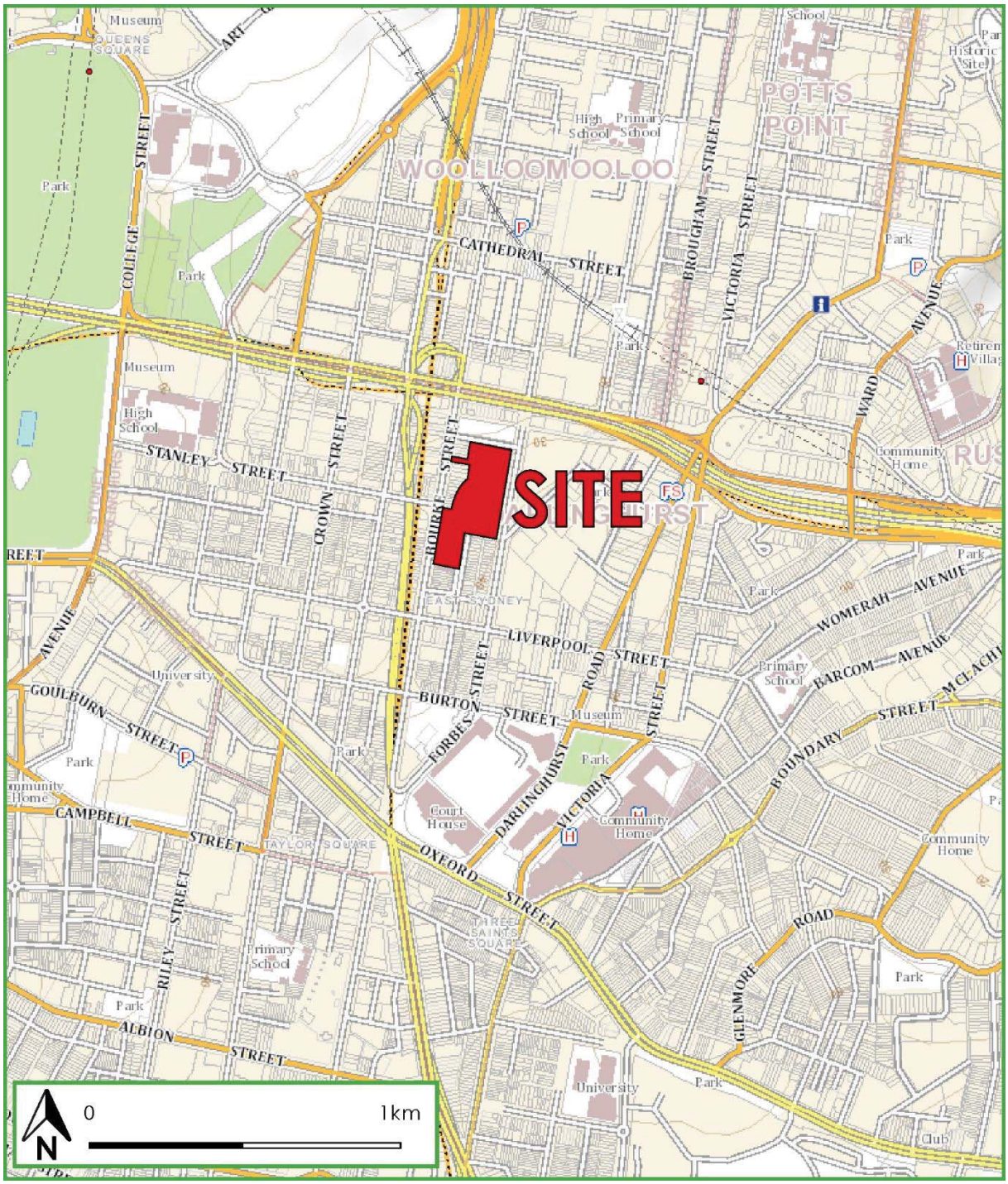


Figure 1: Location Plan

Figure 2: Site Plan

3. Existing Traffic Conditions

3.1 Key Existing Aspects

This report has assessed the critical routes on the surrounding road network as impacted by the current operation of the school, most notably Forbes Street, Liverpool Street and Bourke Street, as identified by SEARs. These have been assessed for the critical peak period conditions based on surveys in the AM and PM peak periods. The following aspects have been considered in the assessment of existing conditions:

- Daily Vehicle Movements: Daily volume conditions are not considered relevant in the context of a school, where peak conditions are the basis for all demands design considerations. Nevertheless, for all roads surveyed, peak volumes would typically be 10% of peak hourly volumes as surveyed on all intersection approaches.
- Peak Vehicle Movements: these have been surveyed at the two (2) key intersections as outlined in **Section 3.7** of this report. The corresponding performances of these intersections have been assessed using SIDRA intersection modelling in **Section 3.8**.
- Public Transport Facilities: These have been assessed in terms of available routes and services as outlined in **Section 3.5**. As there is no change in student or staff numbers, no impacts are expected other than during the various construction stages.
- Pedestrian Facilities: Pedestrian facilitates for each approach are detailed in **Section 3.2**. Existing modal splits for current pedestrian volumes are detailed in **Section 3.6**.
- Bicycle Facilities: The Bicycle facilities are detailed in **Section 3.3**. Existing modal splits identifying current cyclist volumes are discussed in **Section 3.6**.

3.2 Road Network

The site is conveniently located with respect to the arterial road system serving the region, while local access is available using local routes. The following roads are of particular interest:

- William Street: an RMS Main Road (MR173) that traverses in an east-west direction between New South Head Road in the east and Park Street in the west. It is generally subject to 50km/hr speed zoning and accommodates two (2) lanes of traffic in each direction. William Street generally provides a pedestrian footpath along both sides of the road. In addition, there are dedicated bicycle lanes provided along both sides of the road between Palmer Street and Park Street.

- Forbes Street: a local road that traverses in a north-south direction between a no through road at Cowper Wharf Road in the north and Bourke Street in the south. Within the vicinity of the site, it is subject to 40km/hr speed zoning at all times and accommodates a single lane of traffic in each direction. Forbes Street provides pedestrian footpaths along both sides of the road, as well as a pedestrian crossing at the eastern frontage of the site, near the Clapton Place intersection.

- Bourke Street: a local road that traverses in a north-south direction between Cowper Wharf Road in the north and Forbes Street in the south. Within the vicinity of the site, it is subject to 40km/hr speed zoning at all times and accommodates a single lane of traffic in each direction. Bourke Street provides pedestrian footpaths along both sides of the road, as well as a pedestrian crossing at the western frontage of the site, near the Stanley Street intersection. In addition, there are dedicated bicycle lanes along the western side of the road that generally span the length of Bourke Street.

- Liverpool Street: a local road that traverses in an east-west direction between Boundary Street in the east and Harbour Street in the west. Within the vicinity of the site, it is subject to 40km/hr speed zoning at all times and accommodates a single lane of traffic in each direction. Liverpool Street provides pedestrian footpaths along both sides of the road, as well as a pedestrian crossing near the Forbes Street intersection. In addition, this road has been identified as a low-traffic on-road quiet bicycle route.

- St Peters Street: a local street that traverses in an east-west direction between Forbes Street in the east and Bourke Street in the west. It is subject to 40km/hr speed zoning and accommodates westbound traffic via single one-way lane. St Peters Street provides pedestrian footpaths along both sides of the road, as well as a pedestrian crossing midway through the street. In addition, this street is typically only open during the AM and PM peak periods of the school, with a remotely operated gate closed at both ends during other times.

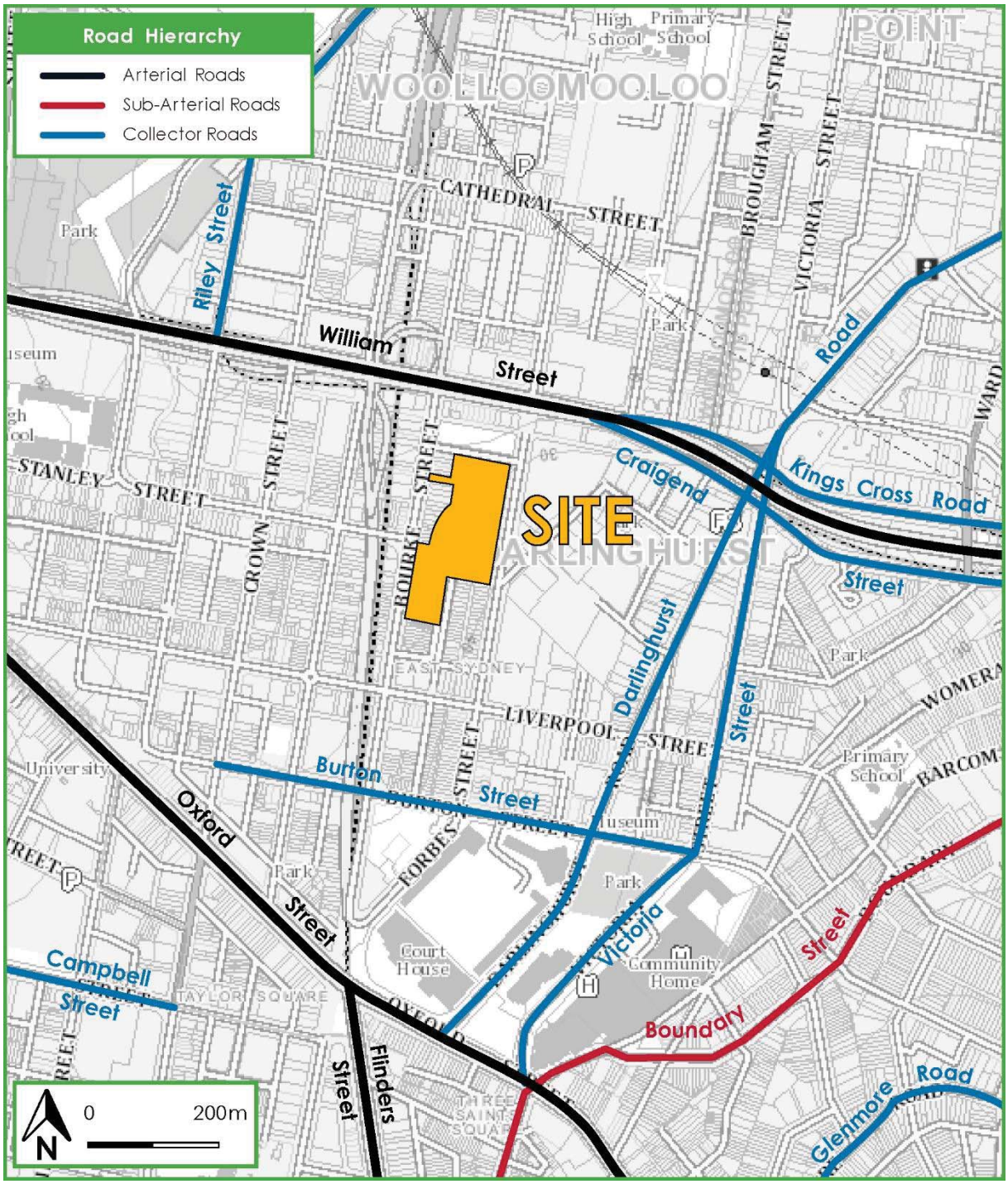


Figure 3: Road Hierarchy

3.3 Bicycle Facilities

The subject site is located within several separated off-road cycleways, off-road shared paths, direct routes with higher traffic routes and low-traffic on-road routes in the surrounding area. The primary cycle-ways in the locality are presented in **Figure 4** and include, but are not limited to the following:

- Separated off-road cycleways: Available throughout the entire length of Bourke Street.
- Off-road shared paths: Available on some sections of William Street and various areas in Hyde Park.
- Direct routes with higher traffic: Along the eastern end of William Street, Darlinghurst Road, Victoria Street and Oxford Street.
- Low-traffic on-road routes: Along the western end of William Street, Forbes Street, Liverpool Street, Burton Street, Crown Street, Riley Street and Clapton Place.

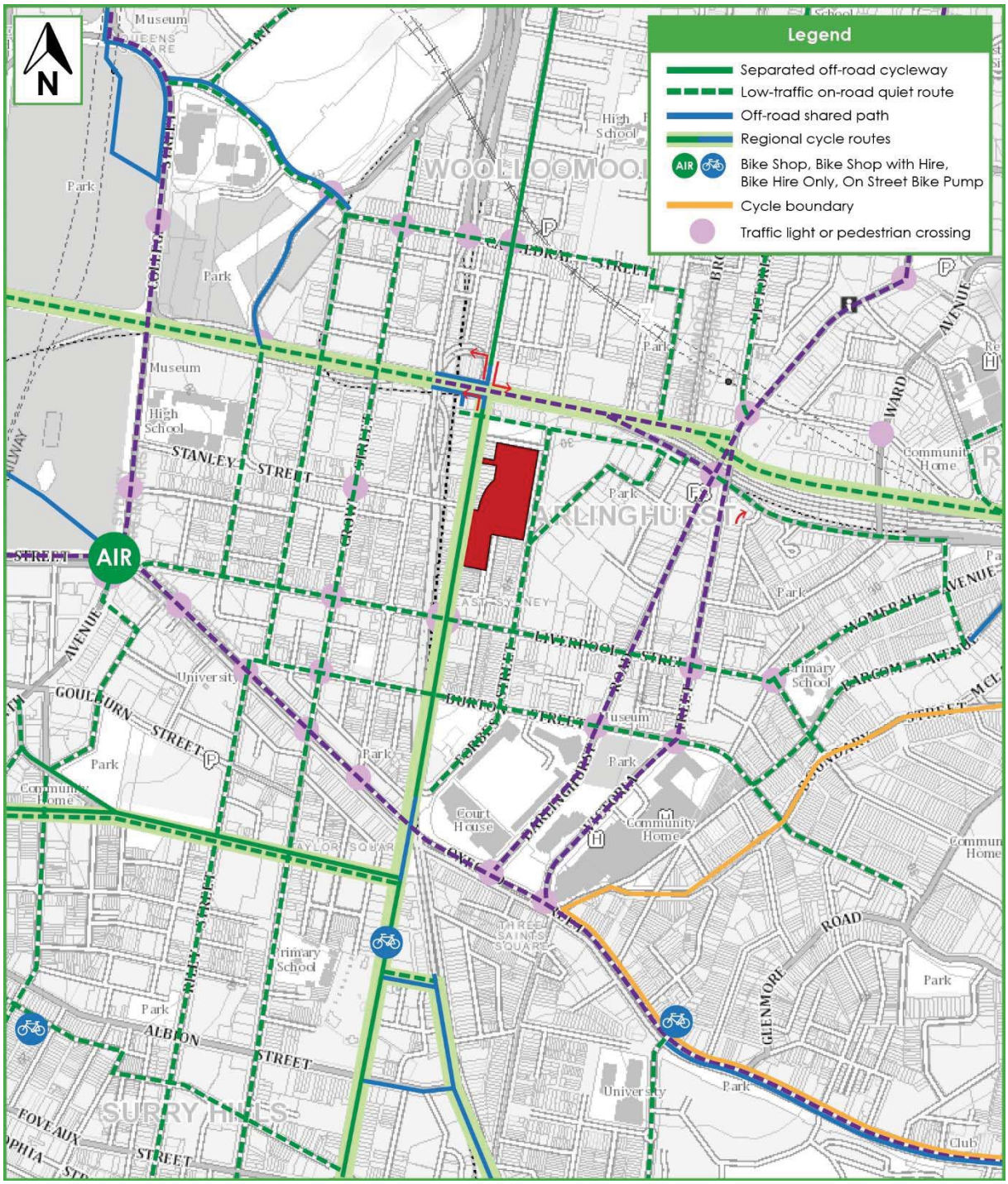


Figure 4: Bicycle Routes in the Locality

3.4 Existing Parking Provision

3.4.1 Off-Street Parking

The school currently provides a total of 112 off-street car parking spaces located at three (3) off-street car parking areas. This off-street parking provision is summarised as follows:

- Primary School car park – Provides 22 off-street parking spaces, with vehicular access via Bourke Street;
- Secondary School car park – Provides 83 off-street car parking spaces, with vehicular access via St Peters Street; and
- Alternate car park – provides seven (7) off-street car parking spaces, with vehicular access via Forbes Street.

3.4.2 On-Street Parking

The local roads surrounding the school provide several on-street parking spaces. This on-street parking provision is summarised as follows:

- 18 leased on-street parking spaces from a neighbouring private car park, located at 184 Forbes Street, Darlinghurst.

The on-street pick-up and drop-off parking spaces serving the school comprises of:

- Primary School – Provides nine (9) on-street parking spaces on Bourke Street; and
- Secondary School – Provides nine (9) parking spaces on Forbes Street.

In addition to the on-street pick-up and drop-off parking provision, it is highly noteworthy that the school operates a staggered pick-up scheme for the Primary School component during the PM peak period. These staggered pick-up schemes are summarised below:

- Kindergarten to Year 2 students – Collected from 2:55pm; and
- Year 3 to Year 6 – Collected from 3:10pm.

3.5 Public Transport

The existing public transport services that operate in the locality are very good as shown in **Figure 5** and these services are available for staff, students and visitors throughout the day on weekdays as well as weekends.

3.5.1 Bus Services

The subject site is located within optimal walking distance (400 metres) of several bus stops which are served by the following routes:

- 200 – Bondi Junction to Chatswood
- 311 – Millers Point to Central Railway Square via Darlinghurst and Potts Point
- 324 – Watsons Bay to Walsh Bay via Old South Head Road
- 325 – Watsons Bay to Walsh Bay via Vaucluse Road
- 389 – Bondi Junction to Pyrmont
- L24 – Vaucluse to City Wynyard

3.5.2 Train Services

The subject site is located within optimal walking distance (800 metres) of Kings Cross Railway Station which is served by the T4 Eastern Suburbs & Illawarra Line.

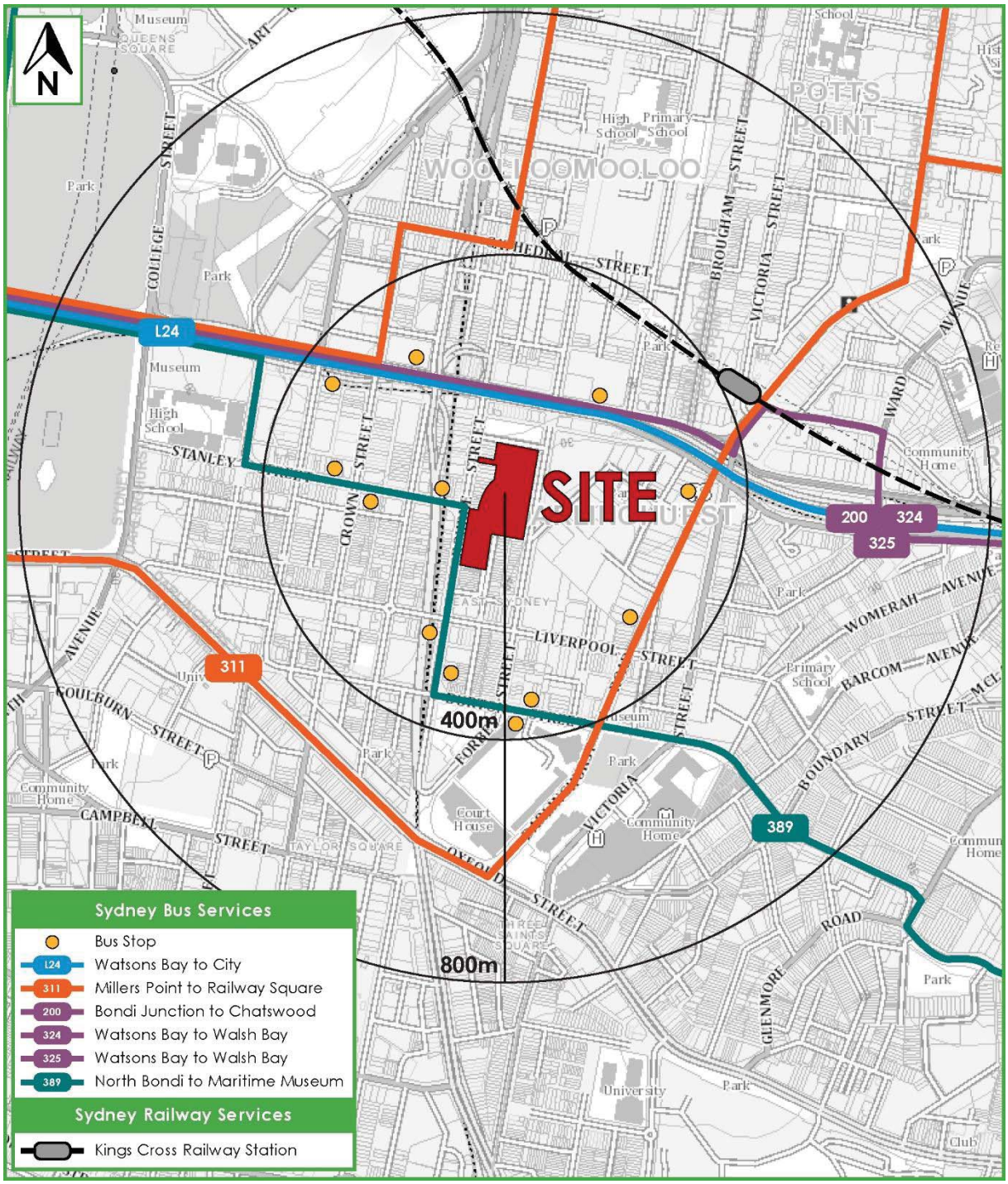


Figure 5: Public Transport

3.6 Existing Travel Modes

As a means of assessing travel modes and traffic generation of the site, online travel mode questionnaire surveys were prepared by TRAFFIX and distributed by the school to all staff and students of SCEGGS.

The online survey was open for responses between 6 September 2018 and 28 September 2018. A sample rate of approximately 76% of full-time staff and 45% of part-time / casual staff was collected and completed. In regards to the students, the survey was separated into two (2) groups, with a sample rate of 78% for students (Kindergarten to Year 4) and 86% of the remaining student population. The survey included a range of questions, which were primarily aimed to gain an understanding of average car occupancies and travel modes in the AM and PM peak periods. The key results of these surveys are discussed in the following sections, with the results of the travel modes summarised below.

3.6.1 Travel Modes

The travel modes for staff is presented below in **Table 1** for both the AM and PM peak periods.

Table 1 – Staff Travel Modes

Travel Mode	AM Peak	PM Peak
By Car (as driver)	53%	59%
By Car (as passenger – pick-up or drop-off)	3%	0%
By Car (as a passenger – car pool)	1%	0%
Public Transport – Bus	7%	7%
Public Transport – Train	15%	15%
Bicycle	6%	5%
Walk	12%	14%
Other	3%	0%
Total	**100%**	**100%**

It can be seen from Table 1 that the preferred mode of travel for staff is vehicle driver, which account for 53% and 59% during the AM and PM peak period, respectively. During the school's AM peak period, public transport (bus and train) is utilised by 22% of the staff, with 18% preferring active travel. During the school's PM peak period, public transport is also utilised by 22% of the staff, with 19% preferring active travel.

The travel modes for students are separated into two (2) groups of Kindergarten to Year 4, and Year 5 to Year 12. These are presented in **Table 2** and **Table 3**, respectively.

Table 2 – Student Travel Modes (Kindergarten to Year 4)

Travel Mode	AM Peak	PM Peak
By Car (pick-up or drop-off)	90%	72%
SCEGGS School Bus from St Vincent's	0%	-
Co-Curricular Activities On-Site	-	15%
Co-Curricular Activities by School Operated Bus	-	8%
Public Transport – Bus	5%	2%
Public Transport – Train	1%	1%
Bicycle	3%	0%
Walk	0%	1%
Other	1%	1%
Total	**100%**	**100%**

It can be seen from Table 2 that during the AM peak period, 90% of students (Kindergarten to Year 4) are dropped-off, with 6% utilising public transport, and 3% preferring active travel. During the PM peak period, 72% of the remaining students are picked-up, with 3% utilising public transport, and 1% preferring active travel.

Table 3 – Student Travel Modes (Year 5 to Year 12)

Travel Mode	AM Peak	PM Peak
By Car (as driver)	1%	1%
By Car (pick-up or drop-off)	44%	16%
SCEGGS School Bus from St Vincent's	1%	-
Co-Curricular Activities On-Site	-	7%
Co-Curricular Activities by School Operated Bus	-	4%
Public Transport – Bus	31%	49%
Public Transport – Train	11%	12%
Public Transport – Ferry	1%	1%
Bicycle	1%	1%
Walk	9%	8%
Other	1%	1%
Total	**100%**	**100%**

NOTE: "Other" travel mode was adjusted based on individual responses, i.e. Ferry, Bus, Train, etc.

It can be seen from Table 3 that during the AM peak period, 44% of students (Year 5 to Year 12) are dropped-off, with 43% utilising public transport (bus, train and ferry), and 10% preferring active travel. During the PM peak period, 16% of the students are picked-up, with 62% utilising public transport, and 9% preferring active travel.

3.6.2 Staff

The results of the survey completed by both full-time and part-time staff of SCEGGS are outlined in **Table 4** to **Table 7** (inclusive). This detailed analysis was completed to ascertain current travel modes and parking locations, as well as arrival / departure times.

Table 4 – Staff Travel Modes

Travel Mode	Number of Staff	Proportion
By Car (as driver)	104	56%
By Car (as passenger – pick-up or drop-off)	2	1%
By Car (as a passenger – car pool)	1	1%
Public Transport – Bus	13	7%
Public Transport – Train	28	15%
Bicycle	10	5%
Walk	24	13%
Other	3	2%
Total	**185**	**100%**

It can be seen from Table 4 that the majority of staff travelling to SCEGGS drive their personal vehicle with 56% (104 staff). Public transport (bus and train) account for 22% (41 staff), with 18% active travel (34 staff). The 104 staff that use a car to get to and from the school currently park their cars in the following areas, as presented in **Table 5**.

Table 5 – Staff Parking Locations

Parking Location	Number of Staff	Proportion
Bourke Street Car Park	17	16%
John Freeman Car Park	74	71%
Forbes Street Car Park	3	3%
Neighbouring Private Car Park	9	9%
Riley Street	0	0%
On-Street (nearby)	0	0%
Other	1	1%
Total	**104**	**100%**

It can be seen from Table 5 that the proportion of staff that use a personal vehicle typically park on-site, with 71% (74 staff) parking at the John Freeman car park and 16% (17 staff) parking at the Bourke Street car park.

Table 6 – Staff Arrival Time

Arrival Time	Number of Staff	Proportion
Before 7:00am	21	11%
7:00am to 8:00am	140	75%
8:00am to 9:00am	21	11%
9:00 to 10:00am	1	1%
After 10:00am	1	1%
Other	1	1%
Total	**185**	**100%**

Table 7 – Staff Departure Time

Departure Time	Number of Staff	Proportion
Before 3:00pm	4	2%
3:00pm to 4:00pm	39	21%
4:00pm to 5:00pm	93	50%
5:00pm to 6:00pm	33	18%
6:00pm to 8:00pm	12	7%
After 8:00pm	0	0%
Other	4	2%
Total	**185**	**100%**

From Table 6 and Table 7 above, 75% (140 staff) arrive between 7:00am to 8:00am during the school's AM peak period. The departure times are distributed with 21% (39 staff) departing between 3:00pm to 4:00pm and 50% (93 staff) departing between 4:00pm to 5:00pm during the school's PM peak period.

3.6.3 Students (Kindergarten to Year 4)

The results of the survey completed by the Kindergarten to Year 4 students of SCEGGS are outlined in **Table 8** to **Table 14** (inclusive). This detailed analysis was completed to ascertain current travel modes, pick-up / drop-off locations, arrival / departure times and private vehicle occupancy.

Table 8 – Kindergarten to Year 4 Travel Modes (AM Peak Period)

Travel Mode	Number of Students	Proportion
By Car (dropped-off)	160	90%
SCEGGS School Bus from St Vincent's	0	0%
Co-Curricular Activities On-Site	-	-
Co-Curricular Activities by School Operated Bus	-	-
Public Transport – Bus	10	5%
Public Transport – Train	1	1%
Bicycle	6	3%
Walk	0	0%
Other	1	1%
Total	**178**	**100%**

It can be seen from Table 8 that during the AM peak period, the majority of Kindergarten to Year 4 students are dropped-off to SCEGGS with 90% (160 students). Public transport (bus and train) account for 6% (11 students), with 3% active travel (6 students). The 160 students that are dropped-off to school are typically dropped-off at the following locations, as presented in **Table 9**.

Table 9 – Kindergarten to Year 4 Drop-Off Locations (AM Peak Period)

Drop-Off Location	Number of Students	Proportion
Bourke Street	155	97%
Forbes Street	5	3%
St Peters Street	0	0%
Total	**160**	**100%**

It can be seen from Table 9 that the proportion of students from Kindergarten to Year 4 are dropped-off on Bourke Street, with 97% (155 students). In total, the arrival time of all 178 students from Kindergarten to Year 4 are outlined in **Table 10** below.

Table 10 – Kindergarten to Year 4 Arrival Time (AM Peak Period)

Arrival Time	Number of Students	Proportion
Before 7:30am	1	1%
7:30am to 8:00am	104	58%
8:00am to 8:30am	72	40%
After 8:30am	0	0%
Other	1	1%
Total	**178**	**100%**

From Table 10, the arrival time for Kindergarten to Year 4 students are distributed with 58% (104 students) arriving between 7:30am to 8:00am and 40% (72 students) arriving between 8:00am to 8:30am during the school's AM peak period.

Table 11 – Kindergarten to Year 4 Travel Modes (PM Peak Period)

Travel Mode	Number of Students	Proportion
By Car (picked-up)	128	72%
SCEGGS School Bus from St Vincent's	-	-
Co-Curricular Activities On-Site	27	15%
Co-Curricular Activities by School Operated Bus	14	8%
Public Transport – Bus	4	2%
Public Transport – Train	1	1%
Bicycle	0	0%
Walk	1	1%
Other	3	1%
Total	**178**	**100%**

It can be seen from Table 9 that during the PM peak period, the majority of Kindergarten to Year 4 students are picked-up from SCEGGS with 72% (128 students). Public transport (bus and train) account for 3% (5 students), with 1% active travel (1 student). The 128 students that are picked-up from school are typically picked-up from the following locations, as presented in **Table 12**.

Table 12 – Kindergarten to Year 4 Pick-Up Locations (PM Peak Period)

Pick-Up Location	Number of Students	Proportion
Bourke Street	113	88%
Forbes Street	15	12%
St Peters Street	0	0%
Total	**128**	**100%**

It can be seen from Table 12 that the proportion of students from Kindergarten to Year 4 are picked-up from Bourke Street, with 88% (113 students). In total, the departure time of all 178 students from Kindergarten to Year 4 are outlined in **Table 13**.

Table 13 – Kindergarten to Year 4 Departure Time (PM Peak Period)

Departure Time	Number of Students	Proportion
Before 5:00pm	150	84%
5:00pm to 5:19pm	8	5%
5:20pm to 5:39pm	4	2%
5:40pm to 5:59pm	3	2%
6:00pm to 8:00pm	11	6%
After 8:00pm	0	0%
Other	2	1%
Total	**178**	**100%**

From Table 13, the departure time for Kindergarten to Year 4 prior to the network PM peak period is 84% (150 students) departing before 5:00pm. The remaining students from Kindergarten to Year 4 are engaged in after school activities and depart at various times during the network PM peak period. These proportions are considered minor and would not significantly affect the performance of the surrounding road network.

The surveys for Kindergarten to Year 4 students also captured a portion of students travelling with siblings. As such, the private vehicle occupancy was calculated based on the 160 students and 128 students that were dropped-off and picked-up during the AM and PM peak periods, respectively. These results are summarised in **Table 14** below.

Table 14 – Kindergarten to Year 4 Private Vehicle Occupancy

Private Vehicle Occupancy	AM			PM		
	Student Arrivals	Proportion*	No of Vehicles	Student Departures	Proportion*	No of Vehicles
0	76	48%	**111**	62	48%	**90**
1	43	27%		37	29%	
2	31	19%		23	18%	
3	10	6%		5	4%	
4	0	0%		1	1%	
Total	**160**	**52%**		**128**	**52%**	

** Note: Proportions adjusted to omit answers "I don't travel by car" and "Other".*

It is evident from Table 14 that 52% of students are being dropped-off or picked-up with siblings or another student for both peak periods. As such, the total number of vehicles at the school for students in Kindergarten to Year 4 is 111 vehicles during the AM peak period and 90 vehicles during the PM peak period.

3.6.4 Students (Year 5 to Year 12)

The results of the survey completed by the Year 5 to Year 12 students of SCEGGS are outlined in **Table 15** to **Table 21** (inclusive). This detailed analysis was completed to ascertain current travel modes, pick-up / drop-off locations, arrival / departure times and private vehicle occupancy.

Table 15 – Year 5 to Year 12 Travel Modes (AM Peak Period)

Travel Mode	Number of Students	Proportion
By Car (as driver)	4	1%
By Car (dropped-off)	333	44%
SCEGGS School Bus from St Vincent's	4	1%
Co-Curricular Activities On-Site	-	-
Co-Curricular Activities by School Operated Bus	-	-
Public Transport – Bus	236	31%
Public Transport – Train	85	11%
Public Transport – Ferry	10	1%
Bicycle	3	1%
Walk	73	9%
Other	5	1%
Total	**753**	**100%**

NOTE: "Other" travel mode was adjusted based on individual responses, i.e. Ferry, Bus, Train, etc.

It can be seen from Table 15 that during the AM peak period, the majority of Year 5 to Year 12 students are dropped-off to SCEGGS with 44% (333 students). Public transport (bus, train and ferry) account for 43% (331 students), with 10% active travel (76 students). The 333 students that are dropped-off to school are typically dropped-off at the following locations, as presented in **Table 16**.

Table 16 – Year 5 to Year 12 Drop-Off Locations (AM Peak Period)

Drop-Off Location	Number of Students	Proportion
Bourke Street	57	17%
Forbes Street	272	82%
St Peters Street	4	1%
Total	**333**	**100%**

It can be seen from Table 16 that the proportion of students from Year 5 to Year 12 are dropped-off on Forbes Street, with 82% (272 students). In total, the arrival time of all 753 students from Year 5 to Year 12 are outlined in **Table 17** below.

Table 17 – Year 5 to Year 12 Arrival Time (AM Peak Period)

Arrival Time	Number of Students	Proportion
Before 7:30am	37	5%
7:30am to 8:00am	445	59%
8:00am to 8:30am	248	33%
After 8:30am	4	1%
Other	19	2%
Total	**753**	**100%**

From Table 17, the arrival time for Year 5 to Year 12 students are distributed with 59% (445 students) arriving between 7:30am to 8:00am and 33% (248 students) arriving between 8:00am to 8:30am during the school's AM peak period.

Table 18 – Year 5 to Year 12 Travel Modes (PM Peak Period)

Travel Mode	Number of Students	Proportion
By Car (as driver)	3	1%
By Car (picked-up)	125	17%
SCEGGS School Bus from St Vincent's	-	-
Co-Curricular Activities On-Site	54	7%
Co-Curricular Activities by School Operated Bus	30	4%
Public Transport - Bus	371	49%
Public Transport - Train	97	13%
Public Transport – Ferry	1	0%
Bicycle	1	0%
Walk	62	8%
Other	9	1%
Total	**753**	**100%**

NOTE: "Other" travel mode was adjusted based on individual responses, i.e. Ferry, Bus, Train, etc.

It can be seen from Table 18 that during the PM peak period, the majority of Year 5 to Year 12 students utilise public transport (bus, train and ferry) with 49% (371 students). Car pick-up accounts for 17% (125 students), with 8% active travel (63 students). The 125 students that are picked-up from school are typically picked-up from the following locations, as presented in **Table 19**.

Table 19 – Year 5 to Year 12 Pick-Up Locations (PM Peak Period)

Pick-Up Location	Number of Students	Proportion
Bourke Street	20	16%
Forbes Street	102	82%
St Peters Street	3	3%
Total	**125**	**100%**

It can be seen from Table 19 that the proportion of students from Year 5 to Year 12 are picked-up from Forbes Street, with 82% (102 students). In total, the departure time of all 753 students from Year 5 to Year 12 are outlined in **Table 20** below.

Table 20 – Year 5 to Year 12 Departure Time (PM Peak Period)

Departure Time	Number of Students	Proportion
Before 5:00pm	634	84%
5:00pm to 5:19pm	48	6%
5:20pm to 5:39pm	12	2%
5:40pm to 5:59pm	19	3%
6:00pm to 8:00pm	10	1%
After 8:00pm	2	0%
Other	28	4%
Total	**753**	**100%**

From Table 20, the departure time for Year 5 to Year 12 prior to the network PM peak period is 84% (634 students) departing before 5:00pm. The remaining students from Year 5 to Year 12 are engaged in after school activities and depart at various times during the network PM peak period. These proportions are considered minor and would not significantly affect the performance of the surrounding road network.

The surveys for Year 5 to Year 12 students also captured a portion of students travelling with siblings. As such, the private vehicle occupancy (as driver and as passenger) was calculated based on the 337 students and 128 students that were dropped-off and picked-up during the AM and PM peak periods, respectively. These results are summarised in **Table 21**.

Table 21 – Year 5 to Year 12 Private Vehicle Occupancy

Private Vehicle Occupancy	AM			PM		
	Student Arrivals	Proportion*	No of Vehicles	Student Departures	Proportion*	No of Vehicles
0	166	49%	239	64	50%	93
1	108	32%		43	34%	
2	47	14%		17	13%	
3	15	4%		4	3%	
4	1	1%		0	0%	
Total	**337**	**51%**		**128**	**50%**	

** Note: Proportions adjusted to omit answers "I don't travel by car" and "Other".*

It is evident from Table 21 that 51% of students are being dropped-off and 50% of students are being picked-up with siblings or another student for the AM and PM peak period, respectively. As such, the total number of vehicles at the school for students in Year 5 to Year 12 is 239 vehicles during the AM peak period and 93 vehicles during the PM peak period.

3.6.5 Summary of Existing Travel Modes

In summary, the results of these travel mode surveys will be used to understand the travel behaviours of staff and students. By ascertaining the various travel modes utilised by staff and students, this data was used in the preparation of a Green Travel Plan, thereby encouraging alternative modes of transportation.

Furthermore, this survey data can assist in identifying the number of students that attend co-curricular school activities that finish outside of typical school hours. This in turn may assist in introducing possible mitigating measures should there be a significant increase in students finishing outside these times in the future.

3.7 Key Intersections

The key intersections in the vicinity of the site are shown below and provide an understanding of the existing road geometry and alignment.

3.7.1 Bourke Street and Liverpool Street

It can be seen from **Figure 6** below, that the intersection of Bourke Street and Liverpool Street is a four-legged signalised intersection, with all legs provided with a signalised pedestrian crossing.

Figure 6: Intersection of Bourke Street and Liverpool Street

The main attributes of each approach are outlined below:

- Bourke Street (north to south direction)
  - The northern approach provides a single lane from which all turns can be made.
  - The southern approach provides a single lane from which all turns can be made.
  - It is noted that there is a designated bicycle lane on both the north and south approaches.
- Liverpool Street (east to west direction)
  - The eastern approach provides a single lane from which all turns can be made.
  - The western approach provides a single lane from which all turns can be made.

3.7.2 Forbes Street and Liverpool Street

It can be seen from **Figure 7** below, that the intersection of Forbes Street and Liverpool Street is a four-legged roundabout intersection.

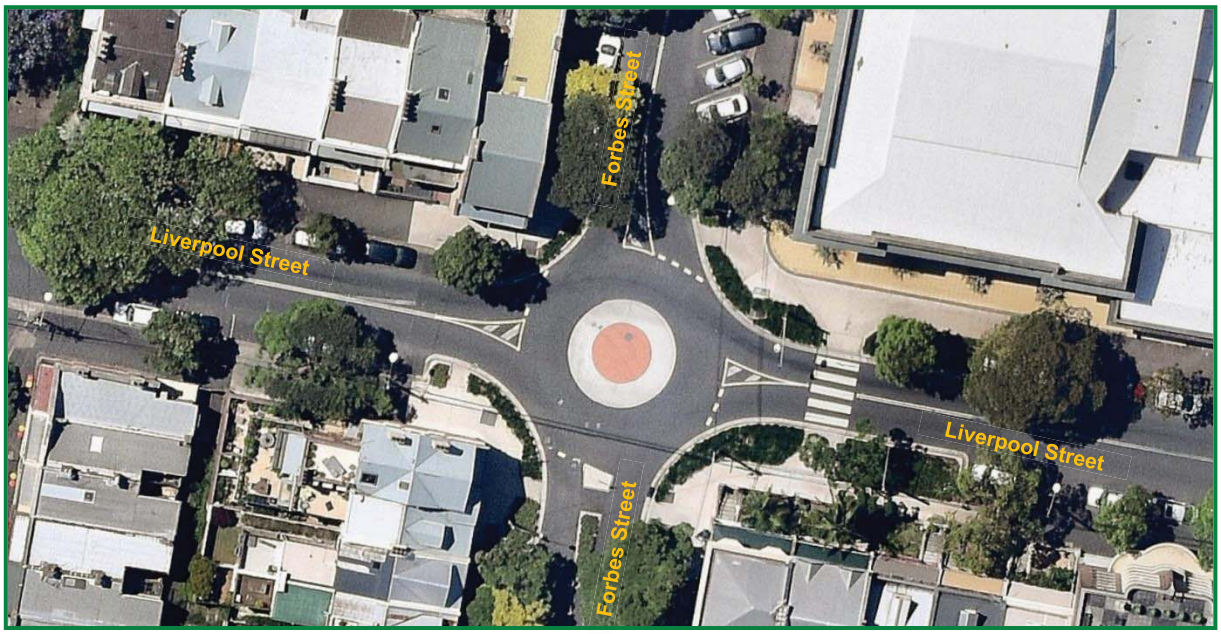


Figure 7: Intersection of Forbes Street and Liverpool Street

The main attributes of each approach are outlined below:

- Forbes Street (north to south direction)
  - The northern approach provides a single lane from which all turns can be made. This approach also provides a painted chevron island.
  - The southern approach provides a single lane from which all turns can be made. This approach also provides a concrete splitter island with a pedestrian refuge.
- Liverpool Street (east to west direction)
  - The eastern approach provides a single lane from which all turns can be made.
  - The western approach provides a single lane from which all turns can be made.
  - Both the east and west approach provide a painted chevron island.

3.8 Existing Intersection Performance

For the purposes of assessing the traffic impacts of this development, surveys were undertaken of the most critical intersections within proximity of the subject site. These surveys were performed during the network peak periods between 7:00am and 9:00am and 4:00pm and 6:00pm, being:

- The intersection of Bourke Street and Liverpool Street; and
- The intersection of Forbes Street and Liverpool Street.

The surveys were analysed using the SIDRA Intersection 8 computer program to determine their performance characteristics under existing traffic conditions. The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DoS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LoS) criteria. These performance measures can be interpreted using the following explanations:

DoS - the DoS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DoS approaches 1, it is usual to attempt to keep DoS to less than 0.9. When DoS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way/stop control, satisfactory intersection operation is generally indicated by a DoS of 0.8 or less.

AVD - the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LoS - this is a comparative measure which provides an indication of the operating performance of an intersection as shown in **Table 22** overleaf.

Table 22 – Intersection Performance Indicators (RMS)

Level of Service (LoS)	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

A summary of the modelled results is provided below in **Table 23**. Reference should also be made to the SIDRA outputs provided in **Appendix B** which provide detailed results for each movement.

Table 23 – Existing Intersection Performance during the AM and PM Peak Periods

Intersection	Control Type	Period	Degree of Saturation (DoS)	Intersection Delay	Level of Service
Bourke Street and Liverpool Street	Signalised	AM	0.590	11.8	B
		PM	0.434	10.9	B
Forbes Street and Liverpool Street	Roundabout	AM	0.154	8.0	A
		PM	0.274	9.0	A

It can be seen from Table 23 that the intersection with the highest intersection delay is the signalised intersection of Bourke Street and Liverpool Street during the AM peak period. This intersection is currently operating good with acceptable delays (LOS B), with a maximum intersection delay of 11.8 seconds. The PM peak period for this intersection also resulted in similar results with a LOS B and a maximum intersection delay of 10.9 seconds. The roundabout intersection of Forbes Street and Liverpool Street are in good operation with a LOS A achieved for both peak periods.

4. Description of Proposed Development

A detailed description of the proposed development is provided in the Environmental Impact Statement, prepared separately. The Concept Masterplan and Stage 1 Development Application (DA) for which approval is now sought are summarised below, with their corresponding Gross Floor Areas (GFA).

4.1 Concept Masterplan

4.1.1 Proposed Building Areas

- The existing buildings have a total GFA of **12,787.1m²**, comprising of the following:
  - Junior School of 977.0m² GFA;
  - Library / Science / Art Building of 2,514.2m² GFA;
  - Yellow Building of 993.5 m² GFA;
  - Old Gym of 630.0m² GFA;
  - Chapel Building of 1,419.8m² GFA;
  - Barham Building of 908.9m² GFA;
  - Centenary Sports Hall of 1,409.3m² GFA;
  - John Freeman Building of 3,095.8m² GFA; and
  - The former car park at the John Freeman Building of 838.6m² GFA.
- Demolition of buildings with a combined GFA of **3,357.3m²**, comprising of the following:
  - Library / Science / Art Building of 2,129.1m² GFA;
  - Old Gym Building of 630.0m² GFA;
  - Chapel Building of 116.5m² GFA; and
  - Barham Building of 481.7m² GFA.
- Construction of buildings, with an additional GFA of **6,480.6m²**, comprising of:
  - Multi-Purpose Building with a combined GFA of 5,659.4m²; and
  - Administration Building with a combined GFA of 821.2m².

In summary of the Concept Masterplan, there will be a net increase of **3,123.3m²** GFA but importantly, no increase in either staff or student numbers, with the new facilities focussed on the delivery of improved functionality, efficiency and amenity.

It is also noted that one of the potential uses of the Multi-Purpose is for a child care centre. While this is not formally proposed, discussion has been provided for the indicative parking and traffic impacts arising from an envisaged capacity for 90 children.

4.1.2 Proposed Car Parking

- Retention of 105 off-street parking spaces, comprising of:
  - 22 car parking spaces, with access via Bourke Street; and
  - 83 car parking spaces, with access via St Peters Street.
- Retention of 18 leased on-street parking spaces from the neighbouring private car park, located at 184 Forbes Street, Darlinghurst.
- Retention of 18 on-street pick-up and drop-off spaces, comprising of:
  - Nine (9) spaces on Bourke Street; and
  - Nine (9) spaces on Forbes Street.
- Removal of seven (7) off-street parking spaces from the alternate car park off Forbes Street.
- Construction of a basement level car park off Bourke Street with a total provision for 22 car parking spaces, comprising of:
  - 15 car parking spaces (including one accessible space);
  - Seven (7) off-street pick-up and drop-off spaces.

4.2 Stage 1 – Wilkinson House Redevelopment

4.2.1 Proposed Building Areas

- Demolition of an existing building with a total GFA of **1,161.9m^2**, comprising of the following:
  - Wilkinson Building of 1,161.9m^2 GFA.
- Construction of buildings, with an additional GFA of **1,325.0m^2**, comprising of:
  - Wilkinson Redevelopment Building with a GFA of 1,507.1m^2.

In summary for Stage 1, there will be a net increase of **163.1m^2** GFA but importantly, as with the Concept Masterplan, there will also be no increase in either staff or student numbers for Stage 1.

4.3 Summary of Proposed Development

- No change to student or staff numbers;
- Total net increase of **3,286.4 m^2** GFA due to the retention, demolishment and construction of various buildings throughout the site; and
- A net increase of 15 on-site parking spaces, including eight (8) staff (or visitor) parking spaces and seven (7) spaces allocated for pick-up and drop-off use.

The parking demands and traffic impacts associated with the development are discussed separately in **Section 5** and **Section 6**. Reference should be made to the architectural plans that are presented in a reduced scale presented in **Appendix C**.

5. Parking Requirements

5.1 Off-Street Parking

The Sydney LEP 2012 stipulates a maximum parking rate for educational establishments, which has been applied to the net additional floor space in **Table 24**.

Table 24 – LEP Parking Rates and Provision

Type	Net GFA	Maximum LEP Car Parking Rate	Permissible Parking
Educational Establishments			
Various Buildings	3,286.4m^2	1 space per 200m^2 GFA	16.4

It can be seen from Table 24 that the proposal will permit a maximum of 16 off-street parking spaces to be provided in addition to the existing parking supply. It is noted that the existing parking supply will be reduced by seven (7) spaces from the alternate car park off Forbes Street. In response, the concept masterplan proposes a total of 22 additional parking spaces, equating in a net increase of 15 car parking spaces. These additional car parking spaces comprise of 15 staff (or visitor) car parking spaces and seven (7) pick-up and drop-off spaces. As such, this net increase in parking provision is compliant with the LEP, based on the net GFA increase.

5.2 On-Street Parking

Notwithstanding that there will be no change in student numbers, there are no rates published for pick-up and drop-off spaces under the LEP or the *Sydney Development Control Plan (DCP) 2012*. Nonetheless the concept masterplan has provided an opportunity to allocate seven (7) additional parking spaces for pick-up and drop-off use, which would alleviate on-street demands.

It is proposed that the overall provision of 18 pick-up and drop-off parking spaces be retained on Bourke Street and Forbes Street, however the following arrangements are sought to accommodate the access to the proposed basement (as part of the concept masterplan):

- Provision of nine (9) pick-up and drop-off spaces on Bourke Street, with the three (3) northernmost spaces to be relocated to the south of these spaces; and
- Retention of nine (9) pick-up and drop-off spaces on Forbes Street.

5.3 Accessible Parking

Schedule 7 of the DCP stipulates that one (1) accessible space should be provided for every 20 car parking spaces or part thereof. Accordingly, the net increase of 15 parking spaces will necessitate a requirement for a single accessible parking space, which has been provided within the basement car park.

5.4 Motorcycle Parking

Schedule 7 of the DCP requires that one (1) motorcycle parking space should be provided for every 12 car parking spaces or part thereof. Accordingly, the net increase of 15 parking spaces will necessitate a requirement for a single motorcycle parking space. Whilst plans do not show provision for a motorcycle space, it is anticipated that this could be provided in response to any Condition of Consent.

5.5 Bicycle Parking

The DCP does not stipulate any bicycle parking rates for primary and secondary educational establishments. As such, the development proposes no additional bicycle parking spaces.

Notwithstanding, the school is noted to accommodate the following bicycle parking facilities:

- Dedicated lockable bike storage areas:
  - ×1 car bay dedicate for bike storage for staff.
  - ×1 lockable bike cupboard on top of the gym that can accommodate 12 student bicycles.
- Shower locations:
  - ×4 in the gym for staff and student use.
  - ×1 in the Joan Freeman building for accessible use.
  - ×1 in the Joan Freeman building for male / female use.
  - ×1 in the Primary School basement for accessible use.
  - ×1 in the Diana Bowman building.

5.6 Servicing Arrangements

The DCP does not stipulate any service vehicle parking rates for educational establishments. Notwithstanding, the additional demands generated by the net increase in floor space is considered to be modest in relation to the overall site, and therefore it is expected that the existing service vehicle parking arrangements will continue to be satisfactory.

5.7 Potential Child Care Centre

Noting that a future child care centre in the Multi-Purpose Building could have potential to accommodate 90 children, the following parking rates would be applicable:

- Maximum of one parking space plus one space per 100m^2 GFA under the Sydney LEP 2012.
- 1 pick-up and set down space per 8 children, which may be reduced subject to factors including:
  - Demand for pick-up and set down parking,
  - Accessibility by walking and public transport,
  - Availability of convenient and safe on-street parking, and
  - Potential traffic and amenity impacts.

In this regard, the child care centre would nominally require 11 pick-up and set down spaces (with a parking provision to be determined upon confirming the GFA). It is anticipated that a traffic assessment would accompany any future Development Application, where it is understood that SCEGGS Darlinghurst will intend to schedule opening times away from the peak activity for the current school. The provision of seven (7) pick-up and drop-off spaces as part of the Concept Masterplan could thus be relied upon, with any concessions to the above rates to be taken into consideration.

6. Traffic Impacts

The Concept Masterplan and Stage 1 DA does not propose any increases in student capacity or staff levels for SCEGGS Darlinghurst. As such, there are expected to negligible impacts on the external road network given the traffic generating potential of the school will be unchanged.

The proposed Wilkinson House redevelopment or Masterplan works should thus not warrant any road upgrades, to which the school already implements measures to improve the efficiency of pedestrian and vehicular movements along Bourke Street. These initiatives are described below, which are carried out on the school's own accord (i.e. not stemming from any existing approval or conditions):

- During morning drop-off periods on Bourke Street, the school employs a dedicated crossing supervisor, a traffic warden to monitor pick-up and drop-off zones and a member of primary school staff to help with efficient on-site vehicular movement.
- During afternoon pick-up periods on Bourke Street, the school employs a dedicated crossing supervisor, a traffic controller to monitor and ensure smooth flow of traffic and two primary school staff to assist with student lining up and entering cars.
- Student Tags are displayed in vehicles for students in Kindergarten to Year 5. Where the student is not ready to be pick-up, cars will be directed to re-join the queue.
- SCEGGS operate staggered pick up times:
    - Kindergarten to Year 2 students are picked up between 2:55pm to 3:10pm and Year 3-12 students are picked-up from 3:10pm.
    - Year 6 students are picked up from Forbes Street to alleviate traffic congestion on Bourke Street.
- SCEGGS also schedules extracurricular activities (e.g. sports) across all weekdays to dilute drop-off and pick-up impacts.

The above initiatives intend to improve the safety of students when entering and egressing from their vehicle, whilst also ensuring traffic flow is efficient and streamlined. Nonetheless, the following measures are also suggested:

- Parent re-education through audits of school operations for pick-up and drop-off facilities. This would involve the school to communicate any concerns following monitoring of the facilities during peak periods and would supplement any enforcement undertaken by Council's rangers or the NSW Police.

- Provision of informative documentation (posters) along the school boundary informing parents of the road rules for No Parking restrictions, these being:
    - The driver may stop their vehicle for a maximum duration of 2 minutes; and
    - The driver must remain within 3 metres of their vehicle.

Finally, it is noted that the potential for a child care centre would have the potential to generate up to 72 vehicle trips per hour, based on application of trip rates under the RMS *Guide to Traffic Generating Developments* (0.8 vehicle trips per child per hour during the AM peak period). These impacts have not been modelled as the centre is not formally proposed as part of the Concept Masterplan, however it is noteworthy that the critical intersections of Liverpool Street at Bourke Street and Forbes Street operate well at a Level of Service of B and A respectively under 2018 conditions.

7. Green Travel Plan

7.1 Overview

A Green Travel Plan (GTP) is a plan intended to make it easier for users to get to and from a development and reduce reliance on private transportation. It typically includes measures to encourage use of public transport as well as walking and cycling. In the case of SCEGGS Darlinghurst, it is envisaged that the school will implement and monitor a final version of the GTP.

This preliminary GTP has been prepared based on the analysis undertaken in this Traffic Impact Assessment and also with regard for Section 4 (Workplan Travel Plan Resource) of the Premiers Council for Active Living publication. Travel mode targets have been nominated for staff and students of SCEGGS Darlinghurst and a Transport Access Guide has been published to increase awareness of transport alternatives.

7.2 Targets

The most effective means to monitor the effectiveness of a Green Travel Plan is to establish targets for mode share. This would include different sets of targets for students and staff, noting that tailored measures and schemes will be introduced to reduce private car dependency. The mode share targets for staff, students between Kindergarten to Year 4 and Year 5 to Year 12 are nominated in **Table 25**, **Table 26** and **Table 27** respectively. It is envisaged that these targets could be achieved within a 5 year time frame.

Table 25 – Staff Mode Share Targets

Travel Mode	AM		PM	
	Current	Target	Current	Target
Car Driver	53%	43%	59%	49%
Car Passenger	4%	6%	0%	2%
Bus	7%	12%	7%	12%
Train	15%	15%	15%	15%
Walk	12%	15%	14%	17%
Bicycle	6%	6%	5%	5%
Other	3%	3%	0%	0%

Table 26 – Kindergarten to Year 4 Students Mode Share Targets

Travel Mode	AM		PM	
	Current	Target	Current	Target
By Car (Dropped Off)	90%	85%	72%	68%
Co-Curricular Activities On-Site	-	-	15%	15%
Co-Curricular Activities by School Operated Bus	-	-	8%	8%
Public Transport – Bus	5%	8%	2%	5%
Public Transport – Train	1%	1%	1%	1%
Bicycle	3%	3%	0%	0%
Walk	0%	2%	1%	2%
Other	1%	1%	1%	1%

Table 27 – Year 5 to Year 12 Students Mode Share Targets

Travel Mode	AM		PM	
	Current	Target	Current	Target
By Car – As Driver	1%	1%	1%	1%
By Car – Dropped Off	44%	34%	16%	16%
SCEGGS School Bus from St Vincent's	1%	1%	-	-
Co-Curricular Activities On-Site	-	-	7%	7%
Co-Curricular Activities by School Operated Bus	-	-	4%	4%
Public Transport – Bus	31%	35%	49%	49%
Train	11%	11%	12%	12%
Ferry	1%	1%	1%	1%
Bicycle	1%	4%	1%	1%
Walk	9%	12%	8%	8%
Other	1%	1%	1%	1%

7.3 Travel Demand Management

It is envisaged that the reductions in car based travel modes to achieve the nominated targets could be facilitated by the following travel demand management measures:

- A Transport Access Guide (TAG) is considered to be a useful travel tool to encourage travel by alternative means other than private car. A draft TAG is included in **Appendix D**, which illustrates the public transport routes operating in the locality. The TAG can easily be distributed to parents, staff and students of SCEGGS Darlinghurst.

- Car sharing schemes can be encouraged for both staff and students. Parents should be encouraged to car-pool multiple students to alleviate congestion during pick-up and drop-off periods. Initiatives could be implemented for staff whereby off-street parking spaces are only available for vehicles transporting two (2) or more staff to work; and

- Implementation of a 'walking bus' concept, where a group of children walk to school with one or more adults. The walking school bus can alleviate safety concerns of parents and develop an active mind set for students.

8. Access & Internal Design Aspects

8.1 Access

In accordance with AS2890.1 (2004), the proposed basement car park requires a Category 1 Driveway, being a combined entry-exit driveway width of 3.0 to 5.5 metres. In response, the proposed Bourke Street access has a combined entry-exit width of 6.8 metres. This access arrangement is considered to be superior to that of the minimum requirements of AS2890.1 (2004), thus expected to perform satisfactorily.

While the design of the driveway will be the subject of a future detailed DA for the multi-purpose building, the proposed driveway on Bourke Street is to be designed with appropriate visual splays, as required by Figure 3.3 of AS2890.1 (2004). These visual splays will assist with pedestrian safety along the Bourke Street frontage by providing the minimum sight lines for egressing drivers. As such, the proposed driveway is able to be accommodated on Bourke Street without adversely impacting pedestrian safety.

8.2 Internal Design

The internal basement car park generally complies with the requirements of AS2890.1 (2004) and AS2890.6 (2009), with the following characteristics noteworthy:

8.2.1 Parking Modules

- All staff parking spaces shall be designed in accordance with a Class 1A User, being a minimum width of 2.4 metres, length of 5.4 metres and a minimum aisle width of 5.8 metres.
- All pick-up and drop-off spaces shall be designed in accordance with a Class 3A User, being a minimum width of 2.6 metres, length of 5.4 metres and a minimum aisle width of 6.6 metres.
- Accessible parking spaces are to be designed in accordance with AS2890.6 (2009), to which an angled parking space requires a minimum space width of 2.4m that is adjacent to a shared space of minimum width 2.4m.
- All spaces located adjacent to obstructions of greater than 150mm in height are to be provided with an additional width of 300mm.

- Dead-end aisles are to be provided with a minimum aisle extension of 1.0 metre in accordance with Figure 2.3 of AS2890.1 (2004).

8.2.2 Clear Head Heights

- A minimum clear head height of 2.2 metres is to be provided for all areas within the basement car park, as required by AS2890.1 (2004).
- A minimum clear head height of 2.5m is to be provided for accessible spaces, as required by AS2890.6 (2009).

8.2.3 Vehicular Access Ramp

- In accordance with AS2890.1 (2004), the vehicular access ramp is to have a maximum grade of 1 in 5 (20%) and have 2.0 metre transitions at both ends with a maximum grade of 1 in 8 (12.5%).
- In accordance with AS2890.1 (2004), the initial area of the ramp from the property boundary is to have a maximum ramp grade of 1 in 20 (5%) for a minimum of 6.0 metres.

8.2.4 Other Considerations

- All columns are to be located outside the parking space design envelope, as required by Figure 5.2 of AS2890.1 (2004).

In summary the internal configuration of the basement car park has been designed in accordance with AS2890.1 (2004) and AS2890.6 (2009). It is however envisaged that a condition of consent on a detailed DA would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

9. Construction Traffic Management

A detailed Construction Traffic Management Plan (CTMP) will be prepared and submitted to Council, in response to any Conditions of Consent stipulated following approval of the SSDA. The below commentary addresses the indicative construction methodology for the Wilkinson House Redevelopment.

9.1 Operational Details

9.1.1 Working Hours

The construction program will be based on a 5.5 day working week with shutdowns during public holidays, industry RDO's and Christmas (two weeks). Construction hours will be in accordance with City of Sydney regulations, which state:

> *"All potentially noisy work in the city centre must be carried out between 7:00am and 7:00pm on weekdays, and 7:00am and 5:00pm on Saturdays.*
>
> *Construction in all other parts of the local area must take place between 7:30am and 5:30pm Monday to Friday, and 7:30am to 3:30pm on Saturday".*

Any other works that may be required to be undertaken outside these normal hours will require the relevant permissions by the contractor. These works may include, but are not limited to oversize deliveries, erection and the dismantling of cranes.

9.1.2 Temporary Learning Areas

The construction program will allow for the delivery and installation of ten (10) temporary demountable functional learning areas. It will be proposed that these temporary areas will be installed in the Centenary Sports Hall for use during the Stage 1 works of the Wilkinson House Building.

These temporary areas will need to be coordinated with school operations and may also be installed during the 2019 HSC period for the completed building to be opened, prior to the 2021 academic year.

9.2 Construction Stages

9.2.1 Demolition Stage

It is envisaged that the demolition stage for the Wilkinson House Building will be approximately 15 weeks, comprising of the following works:

- Scaffolding and edge protection;
- Installation of walkway protection for Peter Street and Forbes Street with B-Class hoarding over the protected walkways for site offices;
- 3 weeks for Hazmat removal; and
- 12 weeks for demolition works.

9.2.2 Bulk Excavation

It is envisaged that the bulk excavation stage will be approximately two (2) weeks however, this is subject to change upon a detailed review of a geotechnical investigation and design development. This stage will comprise of the following works:

- Excavation of approximately 300 cubic metres of rock to be disposed off-site; and
- Underpinning of existing foundations, as appropriate.

9.2.3 Structure and Building Envelope

It is envisaged that the structure and building envelope stage will cater for a typical construction cycle of nine (9) days per floor. The basement slab will be situated on the ground, with the construction of the post-tensioned suspended floor slabs to be constructed thereafter.

9.2.4 Internal Services and Finishes

It is envisaged that the internal services and finishes stage will cater for a duration of nine (9) weeks in the learning areas of each floor. It is assumed that during the rectification of defects and sign-off periods, any FFE to be re-used will be relocated from the demountable back into the new Wilkinson House Building.

9.3 Traffic Control Plans

Traffic Control Plans will be designed in accordance with the RMS Traffic Control at Worksites Manual and AS 1742.3. The TCP's would primarily relate to pedestrian control in order to ensure appropriate safety measures are implemented.

9.4 Construction Vehicles

9.4.1 Trucks and Frequency

It is expected that the maximum sized vehicle to be utilised during the aforementioned construction stages be an 8.8 metre Medium Rigid Vehicle (MRV), with a payload capacity of 12 tonnes.

The anticipated truck frequencies range between two (2) trucks per day (2 in, 2 out) to a maximum of 16 trucks per day (16 in, 16 out).

9.4.2 Tower Crane

It is envisaged that a tower crane will be erected within the floor area and dismantled after the installation of the roof structure works and loading of bulk materials to the floors. The construction program would allow for an eight (8) week period, comprising of works including, but not limited to casting slab infills and closing out the internal services and finishes.

9.5 Swept Path Analysis

Swept Path Analysis should be undertaken for each construction stage proposed by the contractor demonstrating forward entry and exit during all construction stages. All entry and exit movements will be monitored by certified traffic controllers.

Accordingly, it is anticipated that a standard condition of consent would be imposed requiring a site specific CTMP be provided for this development application. The CTMP will be designed in accordance with the above principles and the draft CTMP would be issued to Council at a later stage for consideration and review.

A swept path analysis of key movements of the maximum sized design vehicle (MRV) is included in **Appendix E**.

9.6 Truck Routes

The truck routes utilised for the construction of the development would utilise the arterial road network, where possible. The proposed truck routes are recommended so that all vehicles could access and egress the site in a forward direction. A copy of those routes would be provided to all drivers prior to attending the site and all trucks serving the site will do so via the proposed route only. The proposed truck routes are presented in **Figure 8** and **Figure 9** overleaf, with the routes summarised as follows:

- Routes to the subject site:
  1. Arrive on Southern Cross Drive, northbound.
  2. Continue onto the Eastern Distributor, northbound.
  3. Exit left onto William Street, westbound.
  4. Turn left onto Crown Street, southbound.
  5. Turn left onto Liverpool Street, eastbound.
  6. Turn left onto Forbes Street, northbound.
  7. Turn left to access the site.
- Routes from the subject site:
  1. Egress left from site onto Forbes Street, northbound.
  2. Turn left onto St Peters Street, westbound.
  3. Turn left onto Bourke Street, southbound.
  4. Turn right onto Liverpool Street, westbound.
  5. Turn left onto Palmer Street, southbound.
  6. Turn left onto Oxford Street, eastbound.
  7. Turn right onto Flinders Street southbound.
  8. Turn right onto South Dowling Street, southbound.
  9. Continue onto Southern Cross Drive, southbound.

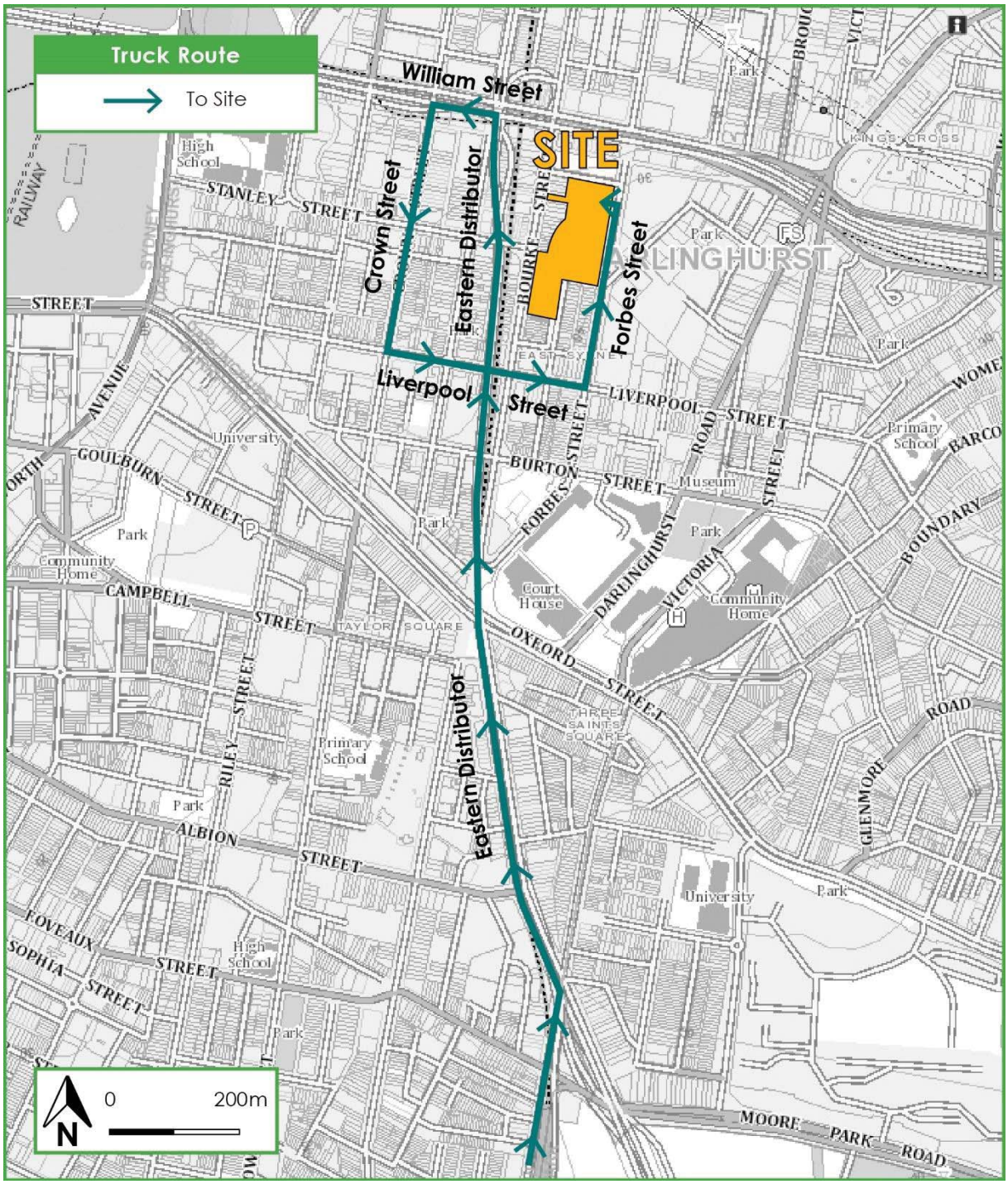


Figure 8: Truck Routes to Site

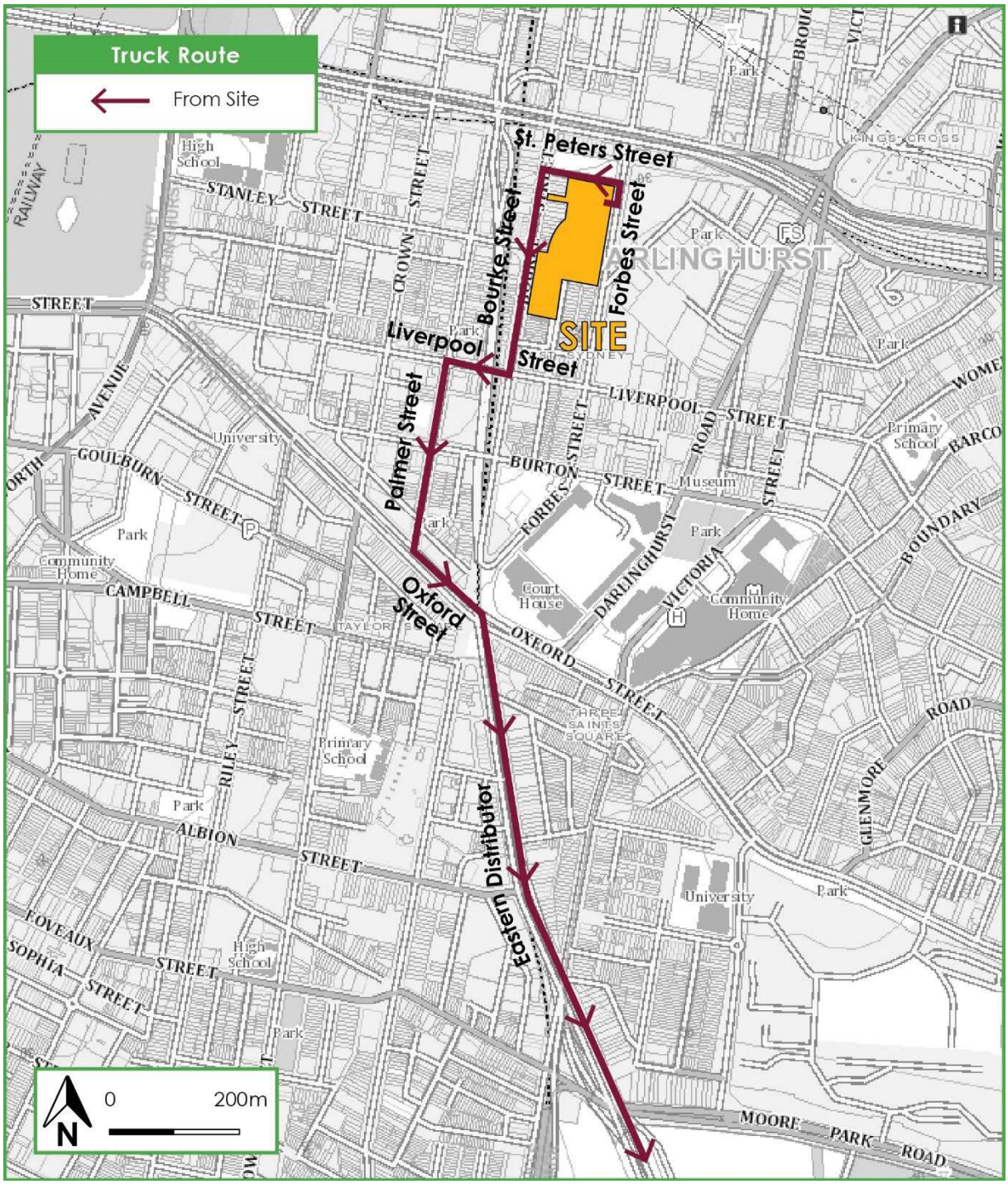


Figure 9: Truck Routes from Site

10. SEARs Requirements

A response to each relevant requirement of the Secretary's Environmental Assessment Requirements (SEARs) is provided below, including references to sections of this report where applicable.

10.1 Concept Masterplan Proposal

7. Transport and Accessibility

Prepare a transport and accessibility impact assessment, which details, but not limited to the following:

Accurate details of the current daily and peak hour vehicle, public transport, pedestrian and cycle movement and existing traffic and transport facilities provided on the road network located adjacent to the proposed development.

- TRAFFIX Response:

  As detailed in **Section 6**, there is no change to the traffic volumes forecast due to fact that no changes to staff or student numbers will arise from the Development Application. Nonetheless, initiatives are described in **Section 7** of this report to increase the uptake in public and active transport using the existing network available.

An assessment of the operation of existing and future transport networks including the bus network and the ability to accommodate the forecast number of trips to and from the development.

- TRAFFIX Response:

  The existing public transport network is assessed in **Section 3** of this report and there are no forecasted changes in trips directly arising from the Development Application given that student and staff numbers will remain the same. There will also hence be no changes sought to the existing public transport network.

Details of estimated total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips based on surveys of the existing and similar schools within the local area.

- TRAFFIX Response:

  The Development Application will not seek to change the number of students or staff and as such an assessment on the trip generating potential of the school is not considered warranted.

The adequacy of public transport, pedestrian and bicycle networks and infrastructure to meet the likely future demand of the proposed development.

- TRAFFIX Response:

  Surveys of the existing school have been undertaken to establish travel mode percentages as detailed in **Section 3**. The changes sought under the Development Application will not directly cause any changes to future demand.

The impact of the proposed development on existing and future public transport infrastructure within the vicinity of the site in consultation with Roads and Maritime Services and Transport for NSW and identify any measures to integrate the development with the transport network.

- TRAFFIX Response:

  As mentioned, the proposed development will not increase the traffic generating potential of the school. Furthermore, the net changes in floor space or parking provision do not warrant referral of the Development Application to the Roads and Maritime Services under the provisions of State Environmental Planning Policy (Infrastructure) 2007). The only external impacts on the road network arise from changes to on-street parking restrictions, which is under the jurisdiction of Council's Traffic Committee.

  Reference should be made to the correspondence with RMS and Transport for NSW (TfNSW), both dated on 7 November 2018 and provided in **Appendix F**. This involved the issue of an earlier draft of this report which assessed the main components of the Concept Masterplan and construction of Wilkinson House. It is noted that the RMS did respond to state that they had no comments to consider prior lodgement of the SSDA, while at the time of writing, TfNSW were yet to respond. Furthermore, an attempt was made to consult with the Airport Motorways Limited, to which no contactable details could be found for this organisation.

Details of any upgrading or road improvement works required to accommodate the proposed development.

- TRAFFIX Response:

  There are no upgrading or road improvement works proposed as part of the Development Application.

Details of travel demand management measures to minimise the impact on general traffic and bus operations and to encourage sustainable travel choices and details programs for implementation, including the preparation of a Green Travel Plan.

- TRAFFIX Response:

  Travel demand measures have been suggested in Section 6 and a Green Travel Plan has been prepared in Section 7 which nominates targets for the reduction in private mode shares.

Details of travel demand management measures to minimise the impact on general traffic and bus operations and to encourage sustainable travel choices and details programs for implementation, including the preparation of a Green Travel Plan.

- TRAFFIX Response:

  Travel demand management measures which the school already implements are outlined in Section 6 and a Green Travel Plan has been prepared in Section 7. The GTP incorporates a Transport Access Guide which can be distributed to students and staff to raise awareness of active and public transport routes, which forms part of the overall strategy to achieve the nominated mode share targets.

The impact of trips generated by the development on nearby intersections including, but not limited to Forbes and Liverpool Streets and Bourke and Liverpool Streets, with consideration of the cumulative impacts from other approved developments in the vicinity, and the need/associated funding for upgrading or road improvement works, if required. Traffic modelling is to be undertaken using, but not limited to, SIDRA network modelling for current and future years.

- TRAFFIX Response:

  The performance of the existing road network is evaluated using SIDRA software modelling with the results in **Section 3** outlined for the intersections of Forbes Street / Liverpool Street and Bourke Street / Liverpool Street. Future performance of these intersections will remain unaffected by the changes sought under the Development Application given student and staff numbers will remain the same.

The proposed active transport access arrangements and connections to public transport services.

- TRAFFIX Response:

  There are no changes to active and public transport networks sought under the Development Application.

The proposed access arrangements, including car and bus pick-up/drop-off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones.

- TRAFFIX Response:

  The Development Application will propose changes to pick-up and drop-off facilities including the provision of on-site spaces and modified on-street parking arrangements. This is discussed in **Section 5** of the report, with a net increase in seven (7) pick-up and drop-off spaces expected to result in an improvement in traffic conditions. There is otherwise anticipated to be no other changes to the external road network that would be attributable to the Development Application.

Measures to maintain road and personal safety in line with CPTED principles.

- TRAFFIX Response:

  These principles interrelate with other disciplines, nonetheless there will be minimal changes to external conditions arising from the Development Application. The basement car park could be secured during times outside of peak pick-up and drop-off activity (during which casual surveillance would occur).

Proposed bicycle parking provision, including end of trip facilities, in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance.

- TRAFFIX Response:

  It is proposed to rely on the existing bicycle facilities for the school which are described in **Section 5**.

Proposed number of on-site car parking spaces and corresponding compliance with existing parking codes and justification for the level of car parking provided on-site.

- TRAFFIX Response:

  An assessment on the parking requirements arising from the net additions to the school is provided in **Section 5**. It was determined that the net increase of 15 car parking spaces complies with the Sydney LEP 2012 for the additional net GFA increase proposed under the Concept Masterplan.

Details of emergency vehicle access arrangements.

- TRAFFIX Response:

  There are no direct changes sought to emergency vehicle access. It is understood that the existing fire hydrant is located adjacent to the intersection of Forbes Street and St Peters Street and in this respect the gates at St Peters Street can be opened to allow the fire truck to park in close proximity. Similarly, these gates could be opened to allow for ambulances, noting that their frequency would be low for this type of facility.

An assessment of road and pedestrian safety adjacent to the proposed development and the details of required road safety measures.

- TRAFFIX Response:

The school actively employs supervision for all pick-up and drop-off activity as detailed in **Section 8**.

Service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times).

- TRAFFIX Response:

The net increase in floor space arising from the Development Application is not expected to generate significant service demands and an overview of the existing arrangements is provided in **Section 5**.

Relevant Policies and Guidelines:

1) *Guide to Traffic Generating Developments (Roads and Maritime Services)*
2) *EIS Guidelines – Road and Related Facilities (DoPI)*
3) *Cycling Aspects of Austroads Guides*
4) *NSW Planning Guidelines for Walking and Cycling*
5) *Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development*
6) *Standards Australia AS2890.3 (Bicycle Parking Facilities)*

- TRAFFIX Response:

This Traffic Impact Assessment has been prepared in accordance with the principles listed in documents (1), (2) & (5). Documents (3), (4) & (6) relate to the design and provision of bicycle parking facilities, to which it is noted that no additional bicycle parking facilities are proposed or warranted in this Development Application.

10.2 Stage 1 – Wilkinson House Redevelopment

4. Transport and Accessibility

A Transport Impact Assessment must be prepared that reassesses the transport impacts of the adaptive reuse of the site for an educational establishment within the context of the assessment undertaken for the Concept Development Application.

TRAFFIX Response:

This Traffic Impact Assessment has been prepared to account for the impacts of all work envisaged under the Concept Proposal, inclusive of all Stage 1 outcomes. Specifically, Stage 1 works will not result in any increase in staff or student numbers, thus will not affect the transport impacts associated with the subject site.

Detail access arrangements for construction and measures to mitigate any associated pedestrian, cyclist or traffic impacts, including the preparation of a preliminary Construction Traffic and Pedestrian Management Plan (CTPMP) to demonstrate the proposed management of impact. The CTPMP should also consider cumulative impacts associated with other construction activities and assess road safety at any key intersections subject to heavy vehicle movements and high pedestrian activity.

An assessment of

- *cumulative impacts associated with other construction activities (if any);*
- *road safety at key intersection and locations subject to heavy vehicle construction traffic movements and high pedestrian activity;*
- *details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process;*

Details of anticipated peak hour and daily construction vehicle movements to and from the site;

Details of access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle;

Details of temporary cycling and pedestrian access during construction;

Details of proposed construction vehicle access arrangements at all stages of construction; and

Traffic and transport impacts during construction, including cumulative impacts associated with other construction activities, and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact.

Relevant Policies and Guidelines:

- *Guide to Traffic Generating Developments*

TRAFFIX Response:

A preliminary Construction Traffic and Pedestrian Management Plan is included in **Section 9**. It includes details of key stages and durations as well as truck sizes, frequencies and durations. It is envisaged that further details can be confirmed once a builder has been appointed after the project has been tendered.

11. Conclusions

In summary:

- TRAFFIX has been commissioned by SCEGGS Darlinghurst to undertake a TIA in support of a SSD for the redevelopment of the SCEGGS Darlinghurst School at 215 Forbes Street, Darlinghurst. The proposal comprises of a Concept Masterplan, as well as Stage 1 approval to proceed with the redevelopment of Wilkinson House.

- The Concept Masterplan and Stage 1 DA for which approval is now sought has a net increase of 3,123.3m^2 GFA and 163.1m^2 GFA, respectively due to the retention, demolishment and construction of various buildings throughout the site. The school does not propose to increase staff or student numbers, with the numbers summarised as follows:
    - Staff: maximum of 157.5 equivalent full-time staff (130 full-time and 55 part-time); and
    - Students: maximum of 942 students.

- The final use of the multi-purpose building has yet to be determined, but part of this building may include the provision of a childcare centre that can accommodate 90 children. It is envisaged that further assessment would be undertaken in a future Development Application stage, however the Concept Masterplan will afford potential pick-up and drop-off parking for use by parents.

- The proposal will be permitted to provide a maximum of 19 additional off-street parking spaces under the Sydney LEP 2012 based on the net GFA increase. In response, the concept masterplan will delete seven (7) existing car parking spaces in a car park accessed of Forbes Street, and proposes an additional 22 off-street parking spaces within a new basement car park accessed via Bourke Street. As such, the overall net increase of 15 car parking spaces is compliant with the LEP rates for the additional GFA.

- It is proposed that seven (7) parking spaces within the same basement are to be allocated as pick-up and drop-off spaces in order to alleviate demands, to which minimal changes are sought to on-street restrictions.

- The proposal will not seek to increase the student capacity for both the primary and secondary school, and on this basis, there are expected to be a negligible change in traffic impacts over existing conditions. As such, no road upgrades are required or anticipated to be required for the proposed Wilkinson House redevelopment or Masterplan works.

  Notwithstanding, the SSDA presents an opportunity to change travel behaviour and a Green Travel Plan has been prepared to encourage uptake in public transport. This will be in the community interest by reducing traffic generation, spreading peak demands and reducing associated parking demands.

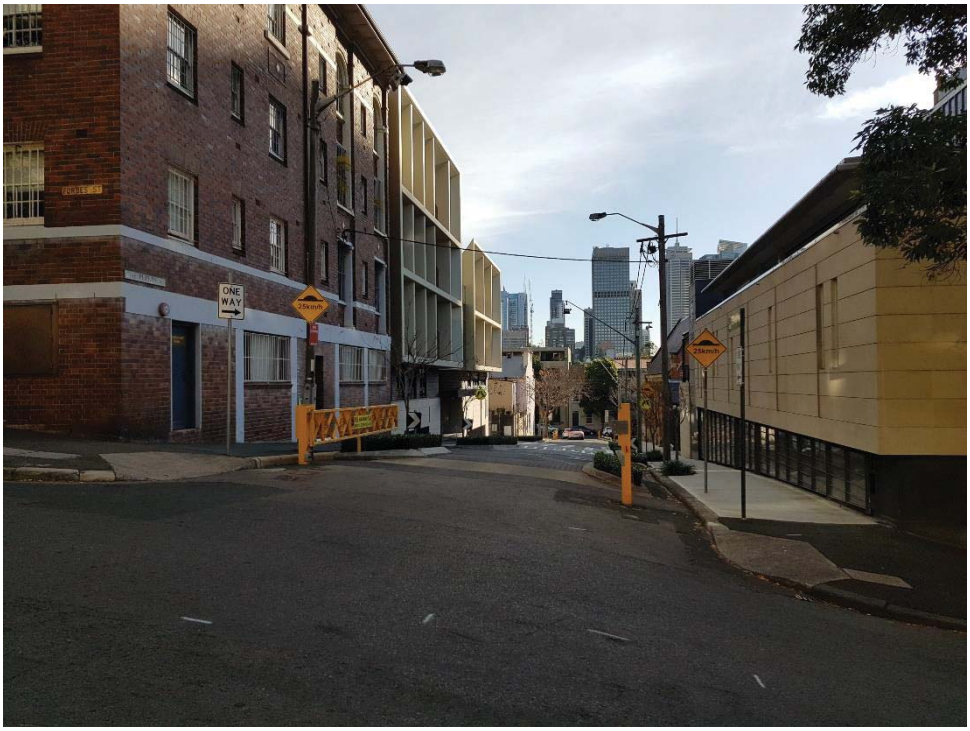
It is therefore concluded that the proposed development is supportable on transport planning grounds and will operate satisfactorily.

Appendix A

Photographic Record

View looking north from Forbes Street towards the subject site.

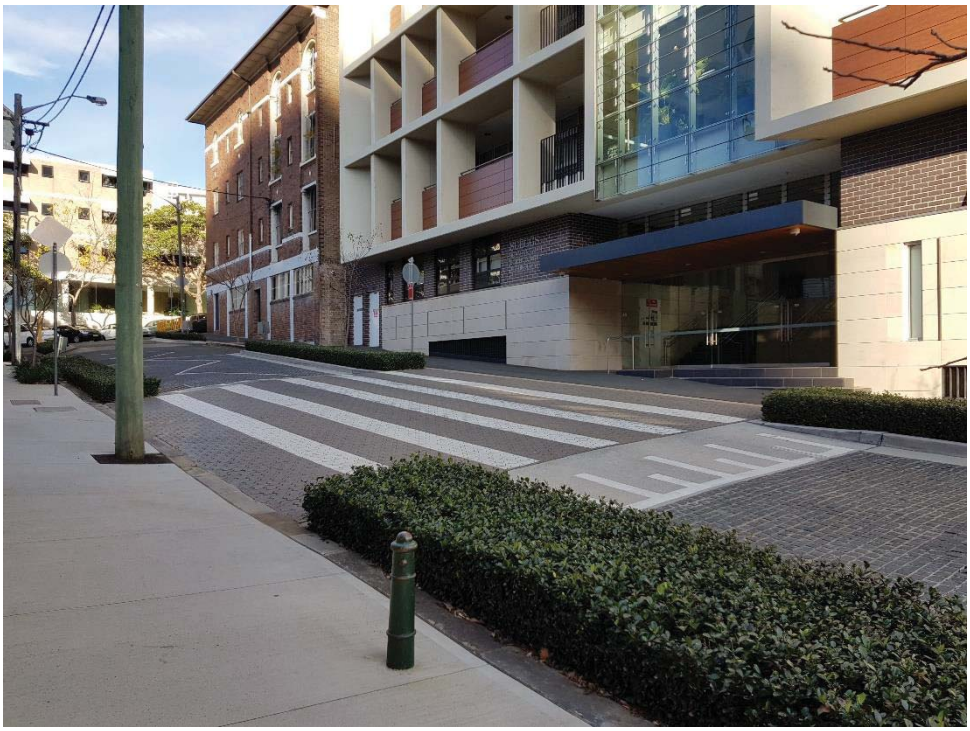
View looking south from Bourke Street towards the subject site.



View looking west from Forbes Street towards St Peters Street.

View looking north towards existing pedestrian crossing on Forbes Street.

View looking east towards existing pedestrian crossing on Bourke Street.



View looking south towards existing pedestrian crossing on St Peters Street.

View looking northeast towards bus pick-up and drop-off area on Forbes Street.

View looking south from pedestrian crossing towards Bourke Street.

Appendix B

SIDRA Outputs

MOVEMENT SUMMARY

Site: 101 [Bourke St x Liverpool St AM EX]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bourke Street												
1	L2	13	0.0	0.136	10.6	LOS B	0.9	6.8	0.70	0.57	0.70	26.6
2	T1	66	17.5	0.136	7.2	LOS A	0.9	6.8	0.70	0.57	0.70	30.1
3	R2	5	0.0	0.136	10.7	LOS B	0.9	6.8	0.70	0.57	0.70	26.6
Approach		84	13.8	0.136	7.9	LOS A	0.9	6.8	0.70	0.57	0.70	29.5
East: Liverpool Street												
4	L2	8	0.0	0.504	15.2	LOS B	2.7	19.0	0.91	0.75	0.91	23.1
5	T1	145	1.4	0.504	11.8	LOS B	2.7	19.0	0.91	0.75	0.91	21.2
6	R2	37	5.7	0.504	15.4	LOS B	2.7	19.0	0.91	0.75	0.91	25.6
Approach		191	2.2	0.504	12.7	LOS B	2.7	19.0	0.91	0.75	0.91	22.4
North: Bourke Street												
7	L2	127	0.8	0.588	12.5	LOS B	4.5	32.4	0.86	0.79	0.89	27.1
8	T1	111	11.4	0.588	9.1	LOS A	4.5	32.4	0.86	0.79	0.89	27.2
9	R2	109	0.0	0.588	12.6	LOS B	4.5	32.4	0.86	0.79	0.89	25.9
Approach		347	3.9	0.588	11.4	LOS B	4.5	32.4	0.86	0.79	0.89	26.8
West: Liverpool Street												
10	L2	28	0.0	0.590	15.7	LOS B	3.7	26.5	0.94	0.81	1.01	25.5
11	T1	220	2.4	0.590	12.3	LOS B	3.7	26.5	0.94	0.81	1.01	21.1
12	R2	8	12.5	0.590	15.9	LOS B	3.7	26.5	0.94	0.81	1.01	21.3
Approach		257	2.5	0.590	12.8	LOS B	3.7	26.5	0.94	0.81	1.01	21.7
All Vehicles		879	4.1	0.590	11.8	LOS B	4.5	32.4	0.88	0.77	0.91	24.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	77	9.6	LOS A	0.1	0.1	0.80	0.80
P2	East Full Crossing	51	9.6	LOS A	0.0	0.0	0.80	0.80
P3	North Full Crossing	163	9.7	LOS A	0.1	0.1	0.81	0.81
P4	West Full Crossing	135	9.7	LOS A	0.1	0.1	0.80	0.80
All Pedestrians		425	9.7	LOS A			0.80	0.80

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Bourke St x Liverpool St PM EX]

New Site
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 30 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Bourke Street												
1	L2	12	0.0	0.101	11.2	LOS B	0.6	4.6	0.72	0.58	0.72	25.5
2	T1	39	18.9	0.101	7.8	LOS A	0.6	4.6	0.72	0.58	0.72	29.2
3	R2	5	0.0	0.101	11.3	LOS B	0.6	4.6	0.72	0.58	0.72	25.6
Approach		56	13.2	0.101	8.9	LOS A	0.6	4.6	0.72	0.58	0.72	28.3
East: Liverpool Street												
4	L2	2	0.0	0.327	13.7	LOS B	1.8	13.6	0.84	0.69	0.84	24.5
5	T1	116	10.9	0.327	10.3	LOS B	1.8	13.6	0.84	0.69	0.84	22.6
6	R2	23	4.5	0.327	13.9	LOS B	1.8	13.6	0.84	0.69	0.84	26.9
Approach		141	9.7	0.327	10.9	LOS B	1.8	13.6	0.84	0.69	0.84	23.5
North: Bourke Street												
7	L2	127	0.8	0.434	12.4	LOS B	3.0	21.7	0.82	0.74	0.82	27.2
8	T1	72	11.8	0.434	9.0	LOS A	3.0	21.7	0.82	0.74	0.82	27.3
9	R2	46	0.0	0.434	12.5	LOS B	3.0	21.7	0.82	0.74	0.82	25.9
Approach		245	3.9	0.434	11.4	LOS B	3.0	21.7	0.82	0.74	0.82	27.0
West: Liverpool Street												
10	L2	17	6.3	0.427	14.0	LOS B	2.8	20.0	0.87	0.71	0.87	27.0
11	T1	197	1.1	0.427	10.5	LOS B	2.8	20.0	0.87	0.71	0.87	22.7
12	R2	3	0.0	0.427	14.1	LOS B	2.8	20.0	0.87	0.71	0.87	22.9
Approach		217	1.5	0.427	10.8	LOS B	2.8	20.0	0.87	0.71	0.87	23.1
All Vehicles		659	5.1	0.434	10.9	LOS B	3.0	21.7	0.83	0.71	0.83	25.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	29	9.6	LOS A	0.0	0.0	0.80	0.80
P2	East Full Crossing	41	9.6	LOS A	0.0	0.0	0.80	0.80
P3	North Full Crossing	79	9.6	LOS A	0.1	0.1	0.80	0.80
P4	West Full Crossing	135	9.7	LOS A	0.1	0.1	0.80	0.80
All Pedestrians		284	9.6	LOS A			0.80	0.80

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Forbes St x Liverpool St AM EX]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Forbes Street												
1	L2	7	0.0	0.020	5.0	LOS A	0.1	0.7	0.38	0.53	0.38	29.8
2	T1	5	0.0	0.020	4.0	LOS A	0.1	0.7	0.38	0.53	0.38	38.9
3	R2	5	0.0	0.020	6.4	LOS A	0.1	0.7	0.38	0.53	0.38	32.8
3u	U	2	0.0	0.020	7.5	LOS A	0.1	0.7	0.38	0.53	0.38	32.9
Approach		20	0.0	0.020	5.4	LOS A	0.1	0.7	0.38	0.53	0.38	34.0
East: Liverpool Street												
4	L2	14	0.0	0.133	5.0	LOS A	0.8	5.7	0.19	0.51	0.19	35.9
5	T1	121	2.6	0.133	4.2	LOS A	0.8	5.7	0.19	0.51	0.19	37.3
6	R2	31	6.9	0.133	6.8	LOS A	0.8	5.7	0.19	0.51	0.19	38.1
6u	U	1	0.0	0.133	8.0	LOS A	0.8	5.7	0.19	0.51	0.19	40.3
Approach		166	3.2	0.133	4.8	LOS A	0.8	5.7	0.19	0.51	0.19	37.5
North: Forbes Street												
7	L2	24	0.0	0.048	4.7	LOS A	0.3	1.9	0.40	0.53	0.40	36.6
8	T1	9	11.1	0.048	4.2	LOS A	0.3	1.9	0.40	0.53	0.40	35.1
9	R2	12	9.1	0.048	6.7	LOS A	0.3	1.9	0.40	0.53	0.40	35.0
9u	U	1	0.0	0.048	7.6	LOS A	0.3	1.9	0.40	0.53	0.40	37.1
Approach		46	4.5	0.048	5.2	LOS A	0.3	1.9	0.40	0.53	0.40	35.9
West: Liverpool Street												
10	L2	24	4.3	0.154	5.1	LOS A	0.9	6.7	0.20	0.49	0.20	36.0
11	T1	154	4.1	0.154	4.3	LOS A	0.9	6.7	0.20	0.49	0.20	37.7
12	R2	9	11.1	0.154	6.9	LOS A	0.9	6.7	0.20	0.49	0.20	33.9
12u	U	5	0.0	0.154	8.0	LOS A	0.9	6.7	0.20	0.49	0.20	16.3
Approach		193	4.4	0.154	4.6	LOS A	0.9	6.7	0.20	0.49	0.20	36.4
All Vehicles		425	3.7	0.154	4.8	LOS A	0.9	6.7	0.23	0.50	0.23	36.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Forbes St x Liverpool St PM EX]

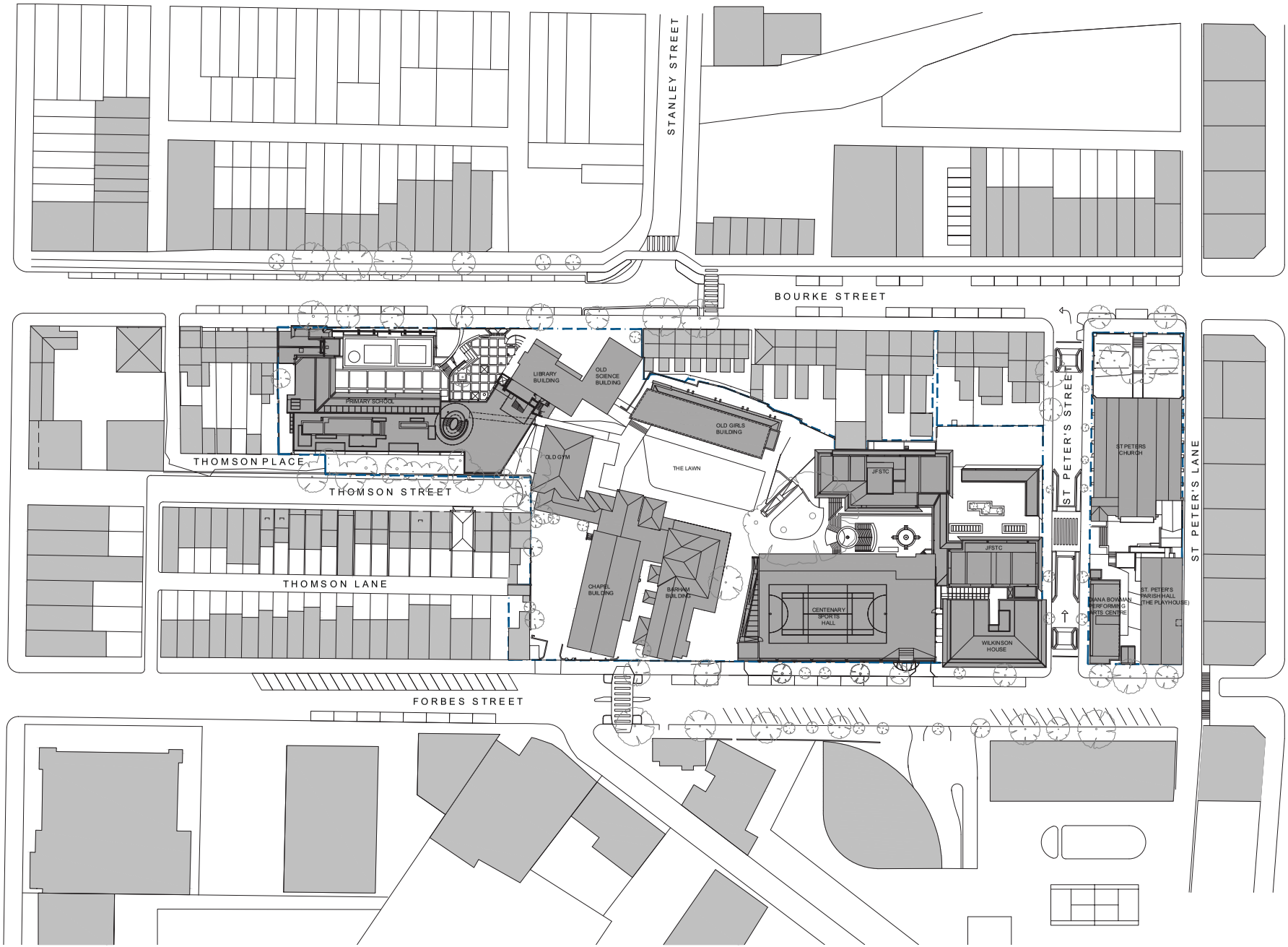
New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Forbes Street												
1	L2	6	16.7	0.032	5.7	LOS A	0.2	1.3	0.44	0.52	0.44	29.7
2	T1	18	5.9	0.032	4.5	LOS A	0.2	1.3	0.44	0.52	0.44	39.0
3	R2	3	0.0	0.032	6.7	LOS A	0.2	1.3	0.44	0.52	0.44	33.0
3u	U	2	0.0	0.032	7.9	LOS A	0.2	1.3	0.44	0.52	0.44	33.2
Approach		29	7.1	0.032	5.2	LOS A	0.2	1.3	0.44	0.52	0.44	36.7
East: Liverpool Street												
4	L2	20	0.0	0.184	5.4	LOS A	1.1	7.8	0.30	0.55	0.30	34.7
5	T1	96	1.1	0.184	4.6	LOS A	1.1	7.8	0.30	0.55	0.30	36.1
6	R2	84	3.8	0.184	7.1	LOS A	1.1	7.8	0.30	0.55	0.30	37.4
6u	U	3	0.0	0.184	8.3	LOS A	1.1	7.8	0.30	0.55	0.30	39.1
Approach		203	2.1	0.184	5.8	LOS A	1.1	7.8	0.30	0.55	0.30	36.7
North: Forbes Street												
7	L2	55	0.0	0.112	5.4	LOS A	0.6	4.5	0.50	0.59	0.50	36.1
8	T1	18	0.0	0.112	4.7	LOS A	0.6	4.5	0.50	0.59	0.50	34.7
9	R2	27	0.0	0.112	7.2	LOS A	0.6	4.5	0.50	0.59	0.50	34.8
9u	U	2	0.0	0.112	8.3	LOS A	0.6	4.5	0.50	0.59	0.50	36.7
Approach		102	0.0	0.112	5.8	LOS A	0.6	4.5	0.50	0.59	0.50	35.6
West: Liverpool Street												
10	L2	62	0.0	0.274	5.7	LOS A	1.9	13.3	0.38	0.54	0.38	35.4
11	T1	218	2.4	0.274	4.9	LOS A	1.9	13.3	0.38	0.54	0.38	36.6
12	R2	26	4.0	0.274	7.4	LOS A	1.9	13.3	0.38	0.54	0.38	32.8
12u	U	5	20.0	0.274	9.0	LOS A	1.9	13.3	0.38	0.54	0.38	14.8
Approach		312	2.4	0.274	5.3	LOS A	1.9	13.3	0.38	0.54	0.38	35.5
All Vehicles		646	2.1	0.274	5.5	LOS A	1.9	13.3	0.38	0.55	0.38	36.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix C

Reduced Plans



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ELECTRICAL / MECHANICAL **Erbas** T +61 2 9437 1022	TRAFFIC CONSULTANT **Traffix** T +61 2 8324 9700	COMMUNITY CONSULTATION **Elton Consulting** T +61 2 9387 2600	ACOUSTIC ENGINEER **Wilkinson Murray** T +61 2 9437 4611

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P4	28.09.18	DRAFT SSD APPLICATION	IB	CP
P5	02.11.18	ISSUE FOR CLIENT REVIEW	IB	CP

ABBREVIATIONS

Proj. Dir	Proj. Arch	Drawn
RD	IB	CP
Job No.	Date	Scale
160441	JUL 18	1:500 @ A1

N

NSW Nominated Architects:
Robert Denton Registration No. 5782
Alex Kibble Registration No. 6015

Do not scale drawings. Verify all dimensions on site. Notify architect of all discrepancies

10 20 30 40 50

Project
SCEGGS DARLINGHURST MASTERPLAN

Drawing Title
EXISTING SITE PLAN

Drawing No. **AR.MP.1101** Revision **P5**

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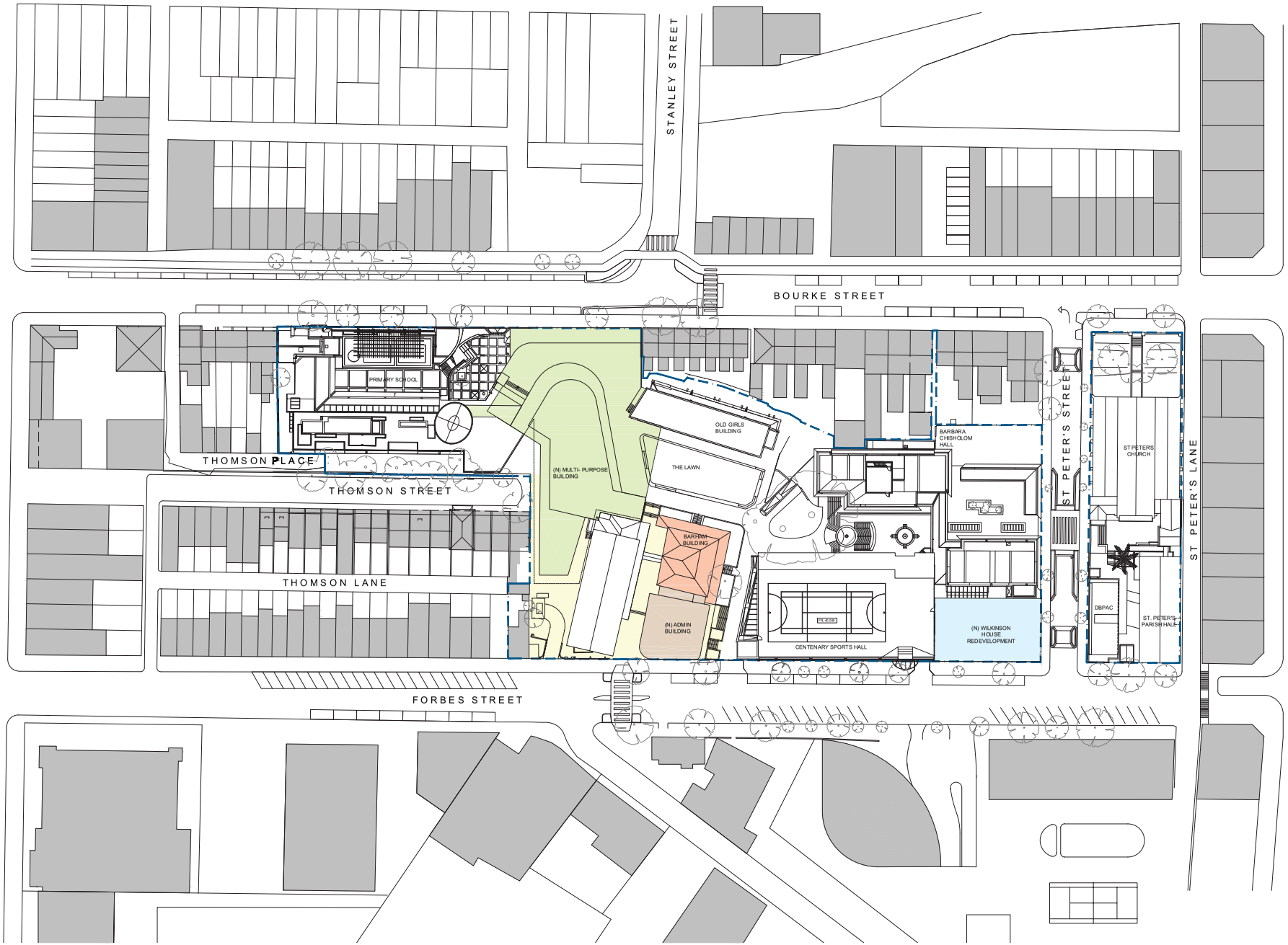

LEGENDS

- (N)MULTI-PURPOSE BUILDING
- (N)ADMINISTRATION BUILDING
- RESTORED BARHAM BUILDING
- REFURBISHED ENTRY
- (N)WILKINSON HOUSE REDEVELOPMENT
- SITE BOUNDARY

PRELIMINARY DRAFT

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ABBREVIATIONS

Proj. Dir	Proj. Arch	Drawn
RD	IB	CP
Job No.	Date	Scale
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NSW Nominated Architects:
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Project
SCEGGS DARLINGHURST MASTERPLAN

Drawing Title
PROPOSED SITE PLAN

Drawing No. **AR.MP.1102**

Revision **P3**

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A : EXISTING GROSS FLOOR AREA (GFA)

MAIN SCHOOL GROUNDS													ST PETERS PRECINCT	217 FORBES STREET	
LEVEL	JUNIOR SCHOOL	LIBRAY/ SCIENCE/ ART BUILDING	YELLOW BUILDING	OLD GYM	CHAPEL BUILDING	BARHAM BUILDING	CENTENARY SPORTS HALL	JOHN FREEMAN BUILDING	WILKINSON BUILDING	FORMER THOMSON PLACE VOID	FORMER CARPARK JOAN FREEMAN BUILDING	TOTAL	ST PETERS CH. / PLAYHOUSE AND DBPAC	TERRACE HOUSE	TOTAL
L1		508.2						250.7				758.90	1007		1007.00
L2	435.3	524.4					1141.6	893.2	126.2		416.5	3537.20	375.6		375.50
L3	541.7	478.3	270.9				171.1	868.1	345.6		422.1	3097.80	143.9		143.90
L4		336.2	238.6	242.3	423.9	39.7	96.6	547.6	345.3			2270.20		44	44.00
L5		347.7	246.6		362.4	514		536.2	344.8			2351.70		44	44.00
L6		319.4	237.4	387.7	298.7	355.2						1598.40		40	40.00
L7					334.8							334.80			0.00
TOTAL (M2)	977.00	2514.20	993.50	630.00	1419.80	908.90	1409.30	3095.80	1161.90			13949.00	1526.50	128.00	1654.50

B : DEMOLISHED GROSS FLOOR AREA (GFA)

MAIN SCHOOL GROUNDS													ST PETERS PRECINCT	217 FORBES STREET	
LEVEL	JUNIOR SCHOOL	LIBRAY/ SCIENCE/ ART BUILDING	YELLOW BUILDING	OLD GYM	CHAPEL BUILDING	BARHAM BUILDING	CENTENARY SPORTS HALL	JOHN FREEMAN BUILDING	WILKINSON BUILDING	FORMER THOMSON PLACE VOID	FORMER CARPARK JOAN FREEMAN BUILDING	TOTAL	ST PETERS CH. / PLAYHOUSE AND DBPAC	TERRACE HOUSE	TOTAL
L1		373.5										373.50			
L2		392.1							126.2			518.30			
L3		328							345.6			673.60			
L4		336.2		242.3	82.7	39.7			345.3			1046.20			
L5		347.7			33.8	254.6			344.8			980.90			
L6		319.4		387.7		187.4						894.50			
L7		32.2										32.20			
TOTAL (M2)		2129.10		630.00	116.50	481.70			1161.90			4519.20			

C : PROPOSED ADDITIONAL GROSS FLOOR AREA (GFA) *

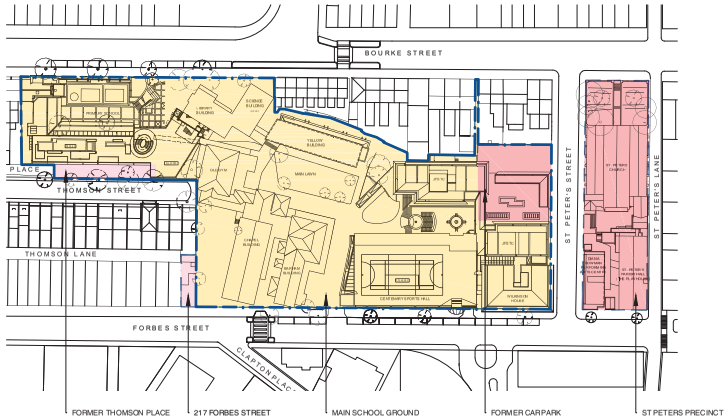
LEVEL	MULTI PURPOSE BUILDING	ADMIN BUILDING	WILKINSON REDEVELOP-MENT	TOTAL
L1	144.1			144.1
L2	1624.5		285.0	1909.5
L3	970.6		340.0	1310.6
L4	867.1	180.9	350.0	1398.0
L5	867.1	180.9	350.0	1398.0
L6	867.1	243.7	0.0	1110.8
L7	318.8	215.8		534.6
TOTAL (M2)	5659.4	821.2	1325.0	7805.6

ALOWABLE FLOOR SPACE RATIO (FSR) SUMMARY CONSOLIDATED ALLOTMENT

	TOTAL AREA M2	FSR	POTENTIAL M2	COMBINED GFA PERMITTED
MAIN SCHOOL GROUND	10503.2	1.5	15754.8	15754.8
FORMER CAR PARK	787.3	2	1574.6	1574.6
ST PETERS PRECINCT	2049	2	4098.0	
THOMSON PLACE	228.5	1.75	399.9	399.9
217 FORBES STREET	108.2	1.75	189.4	
TOTAL (M2)	13676.2		22016.6	17729.3

MASTERPLAN GROSS FLOOR AREA (GFA) SUMMARY *

LEVELS	EXISTING GFA (A)	DEMOLISHED GFA (B)	PROPOSED GFA (C)	TOTAL (A-B+C)		
L1	758.9	373.5	144.1	529.5		
L2	3537.2	518.3	1909.5	4928.4		
L3	3097.8	673.6	1310.6	3734.8		
L4	2270.2	1046.2	1398.0	2622.0		
L5	2351.7	980.9	1398.0	2768.8		
L6	1598.4	894.5	1110.8	1814.7		
L7	334.8	32.2	534.6	837.2		
TOTAL (M2)	13949.0	4519.2	7805.6	17235.4	ADDITIONAL GFA	3286.412



FLOOR SPACE RATIOS FROM SYDNEY LEP 2012

1.75 :1 | 1.5 :1 | 2 :1

CONSOLIDATED ALLOTMENT USED TO CALCULATE FSR FOR MASTERPLAN

NOTES :

* MULTI PURPOSE BUILDING AND ADMIN BUILDING INCLUDE 7% AREA EXCLUDED FROM ENVELOPE AREA, TO CALCULATE GFA AND ALLOWS FOR DESIGN DEVELOPMENT FOR SERVICES, CIRCULATION, STORAGE, ETC.

* GFA EXCLUDES AREA OF VOID ON LEVEL 3 ABOVE POTENTIAL SWIMMING POOL (622 M2)

- GFA CALCULATED IN ACCORDANCE WITH SYDNEY LOCAL ENVIRONMENTAL PLAN 2012 GFA DEFINITION

LEGENDS

EXISTING GFA

DEMOLISHED GFA

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160441	NOV 17	1:1000 @ A1

NSW Nominated Architects:
Robert Denton Registration No. 5782
Alex Kibble Registration No. 6015

Do not scale drawings. Verify all dimensions on site. Notify architect of all discrepancies

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Project
SCEGGS DARLINGHURST MASTERPLAN

Drawing Title
GFA CALCULATIONS CONSOLIDATED ALLOTMENTS

Drawing No. AR.MP.1103

Revision P5

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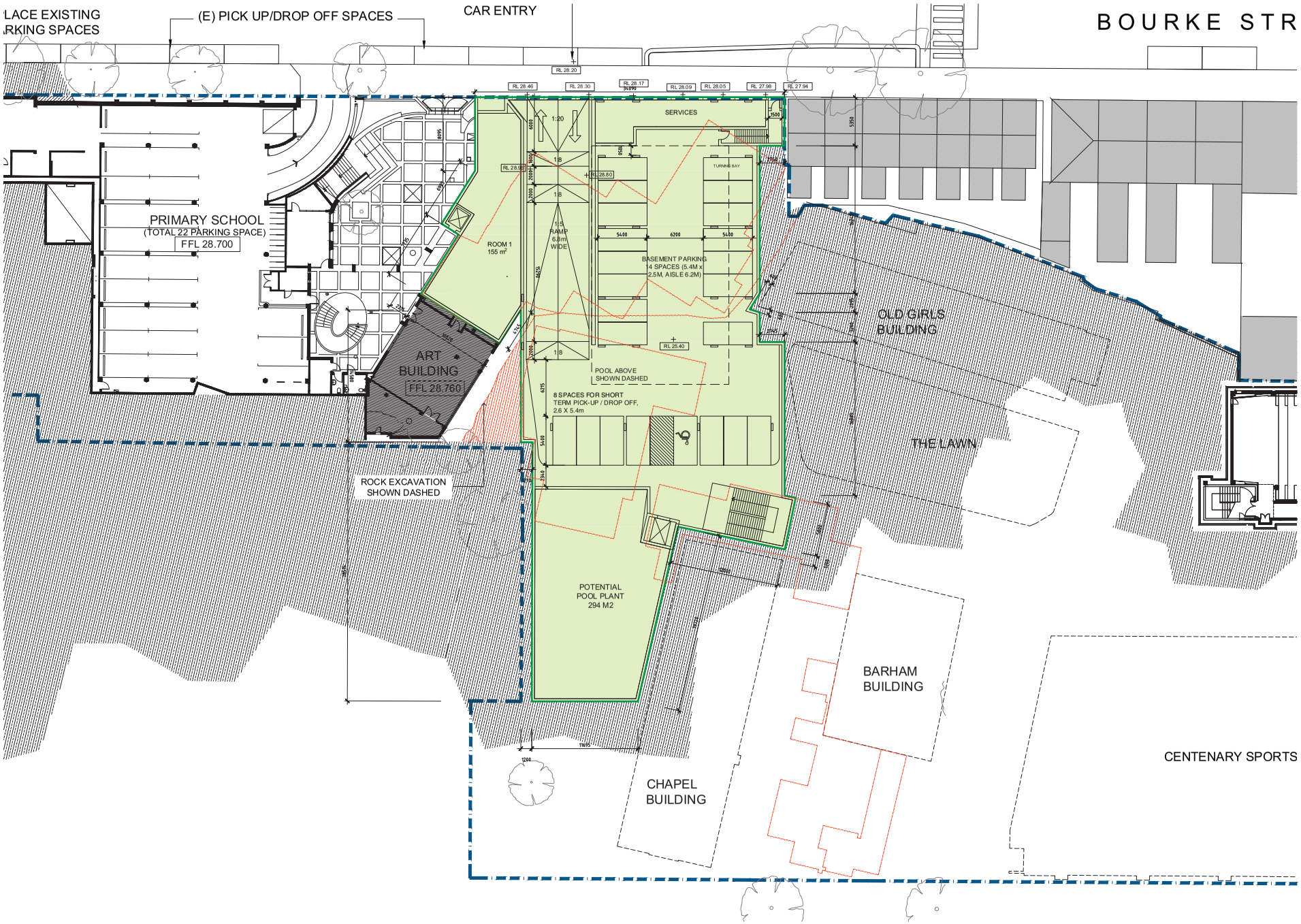

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ABBREVIATIONS

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NSW Nominated Architects:
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Alex Kibble Registration No. 6015

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Project
SCEGGS DARLINGHURST MASTERPLAN

Drawing Title
ENVELOPES DIMENSIONS LEVEL 1

Drawing No. **AR.MP.2009**

Revision **P5**

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Appendix D

Transport Access Guide

CAR

Driving? There are various car parking areas available at SCEGGS. The School car parks are accessible from Bourke Street and St Peters Street, with a limited number of spaces available in the nearby private car park at 184 Forbes Street, Darlinghurst. In addition, there will be a new basement car park accessible from Bourke Street (closer to the Stanley Street intersection) that will provide an alternate car parking area, upon completion. These parking areas are ideally placed for your safety and convenience.

Picking-up or Dropping-off? There are several pick-up and drop-off zones near the School's Gates, along Bourke Street and Forbes Street. In addition, the new basement car park (accessible from Bourke Street, near Stanley Street) will provide additional pick-up and drop-off spaces, upon completion. Please consider the safety of children and other drivers when picking-up or dropping-off students. For more information regarding pick-up and drop-off areas, please refer to the Traffic and Pedestrian Management Plan prepared by SCEGGS.

Have Siblings or Friends living nearby? Car Pooling is a great way to get to SCEGGS with the various parking and pick-up/drop-off areas near-by. Please consider your co-workers and friends when attending SCEGGS to arrange your schedules.

BUS

Catching the Bus? There are several publicly operated Bus-Stops along Stanley Street, Bourke Street and William Street that provide regular services to various areas throughout Sydney. In addition, SCEGGS provides School Bus services from St Vincent's, as well as School Buses for Co-Curricular Activities. For more information concerning service frequencies for the Public Bus Services, please visit the Transport Info website at: **http://transportnsw.info**. For information regarding School Bus services, please contact SCEGGS.

TRAIN

Catching the Train? Train services from Kings Cross Railway Station can provide staff and students with an alternative mode of transport throughout the Eastern Suburbs and Illawarra areas (T4 Line), as well as the South Coast area (SCO Line). You can get to Kings Cross Station by walking (8-minute walk) via Darlinghurst Road.

CYCLING

Riding a Bike? Staff and students are encouraged to take advantage of the Cycleways and Bicycle Shared-Paths available in the surrounding area on Bourke Street, William Street and Darlinghurst Road. A cycle route has been included in this TAG that shows the available Cycleways around SCEGGS, with route updates to be maintained accordingly.

WALKING

Live nearby? Consider walking to SCEGGS as a great way to get moving in the morning and encourage active travel for all staff and students of the School. A walking route has been included in this TAG for SCEGGS. For alternative cycling and walking routes please visit **http://www.sydneycycleways.net/** or **http://www.rms.nsw.gov.au/roads/bicycles/cycleway-finder.html** for more information.

ACTIVE TRAVEL

This Transport Access Guide (TAG) provides information to staff, students and parents on how to get to and from SCEGGS by active travel – without a car.

Active Travel means walking, cycling and/or using public transport. It is easy to get to and from SCEGGS by active public transport, as there are regular Bus and Train services operating in the surrounding areas.

SCEGGS supports active travel as its benefits include:

- Less car use
- Reduced carbon emissions and improved air quality
- Less traffic congestion
- A safer, more pleasant urban environment
- Opportunities for parents, staff and kids to be more active

For further public transport information
go to **www.transportnsw.info** or call **131 500**

TRANSPORT ACCESS GUIDE

Sydney Church of England Girls Grammar School (SCEGGS)

162-215 Forbes Street, Darlinghurst

LUCEAT LUX VESTRA

Public Transport Map

TRANSPORT ACCESS GUIDE

Sydney Church of England Girls Grammar School (SCEGGS)

162-215 Forbes Street, Darlinghurst

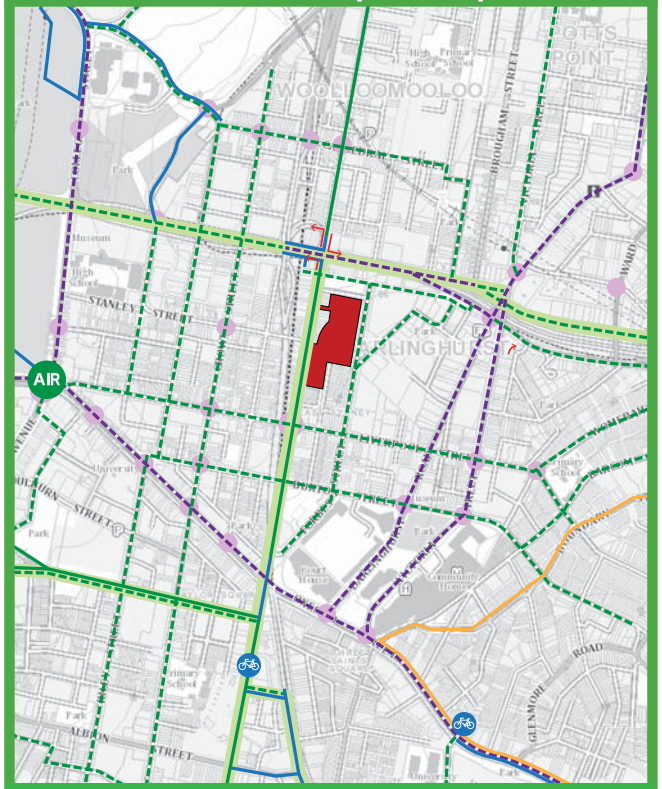
Sydney Bus Services

- Bus Stop
- L24 Watsons Bay to City
- 311 Millers Point to Railway Square
- 200 Bondi Junction to Chatswood
- 324 Watsons Bay to Walsh Bay
- 325 Watsons Bay to Walsh Bay
- 389 North Bondi to Maritime Museum

Sydney Metro Railway Services

- Kings Cross Railway Station

Active Transport Map

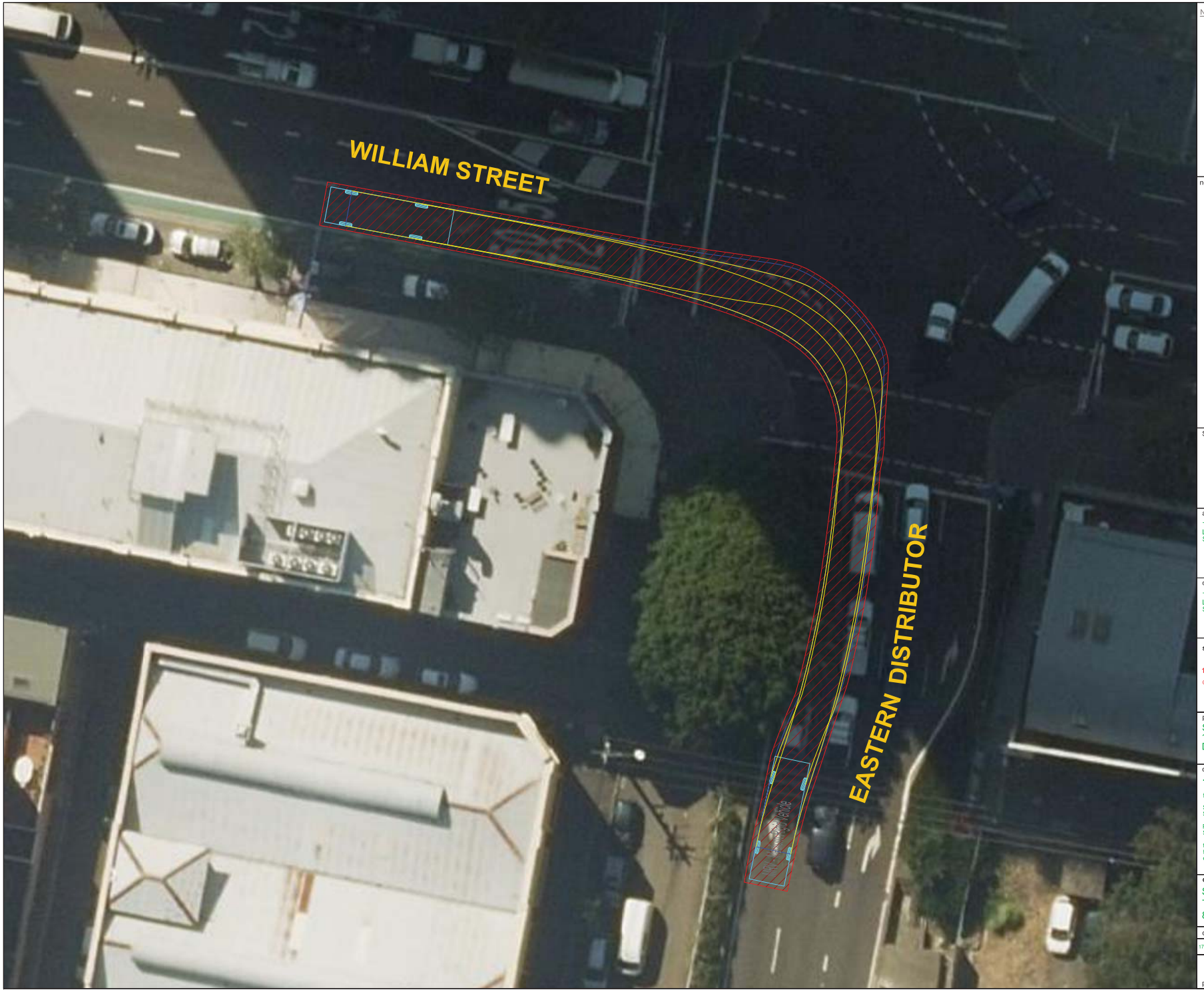


Legend

- Separated off-road cycleway
- Low-traffic on-road quiet route
- Off-road shared path
- Regional cycle routes
- AIR Bike Shop, Bike Shop with Hire, Bike Hire Only, On Street Bike Pump
- Cycle boundary
- Traffic light or pedestrian crossing

Appendix E

Swept Path Analysis



Notes

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards (*AS/NZS 2890.1-2004 Parking facilities - Off-street car parking*, and/or *AS 2890.2-2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

no.	revision note	by.	date

Swept Path Legend:

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

architect

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Level 7, 19 Foster Street
Surry Hills NSW 2010

client

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Level 7, 19 Foster Street
Surry Hills NSW 2010

scale

1:250 @ A3

0m 2 4 6 8

project

SCEGGS Darlinghurst
165-215 Forbes Street
Darlinghurst NSW 2010

drawing prepared by

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traffix
traffic & transport planners

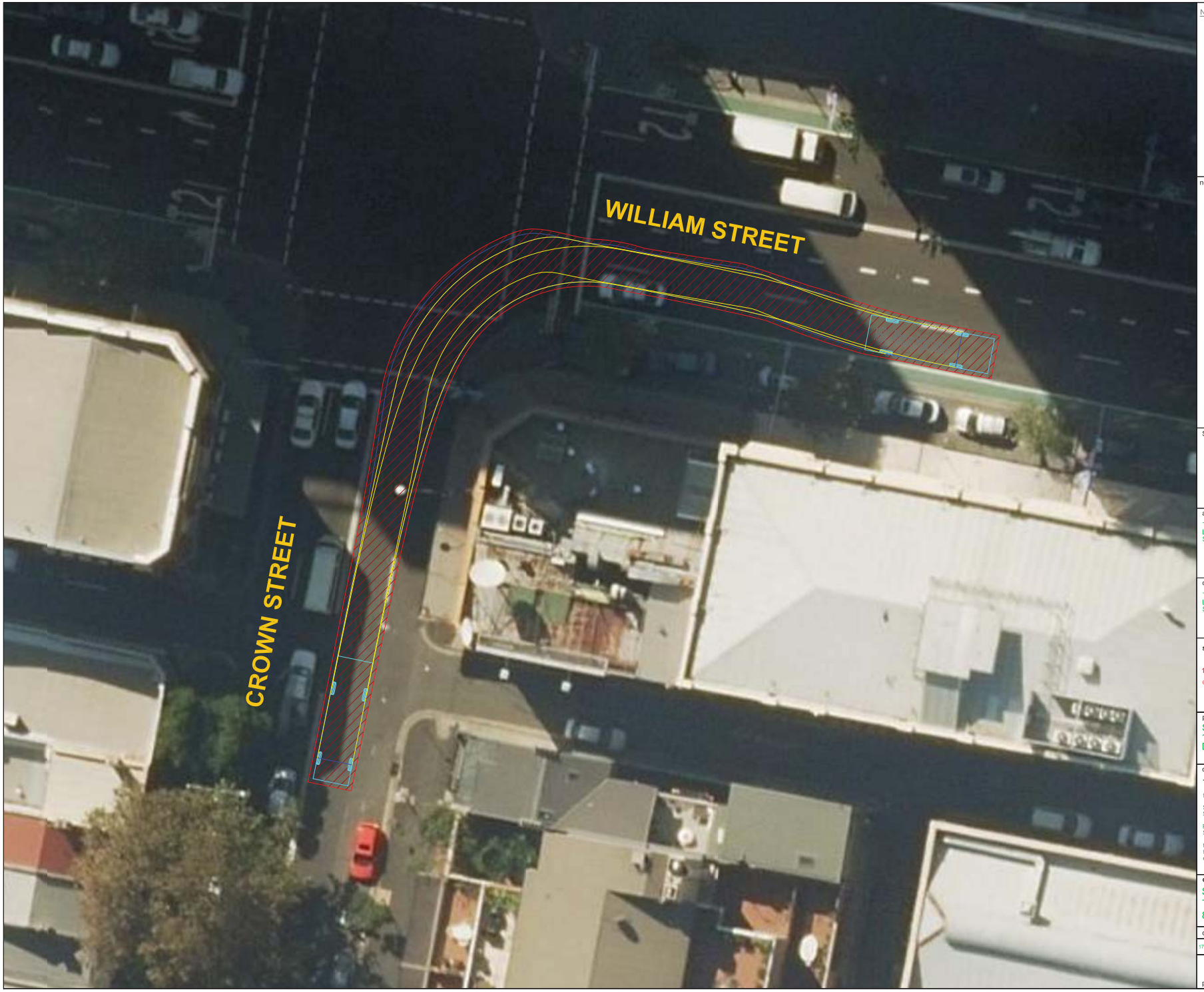
drawing title

Swept Path Analysis
Truck Routes - Eastern Distributor x William St
8.8m Medium Rigid Vehicle

drawn:	checked:	date:
NC	KB	31-10-2018

17.312d06v01 TRAFFIX - Truck Routes Swept Path Analysis.dwg

project no.	drawing phase.	drawing no.	rev
17.312	-	TX.01	-



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Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards (*AS/NZS 2890.1-2004 Parking facilities - Off-street car parking*, and/or *AS 2890.2-2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

no.	revision note	by.	date

Swept Path Legend:

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

architect

Tanner Kibble Denton Architects Pty Ltd
Level 7, 19 Foster Street
Surry Hills NSW 2010

client

Tanner Kibble Denton Architects Pty Ltd
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Surry Hills NSW 2010

scale

1:250 @ A3

0m 2 4 6 8

project

SCEGGS Darlinghurst
165-215 Forbes Street
Darlinghurst NSW 2010

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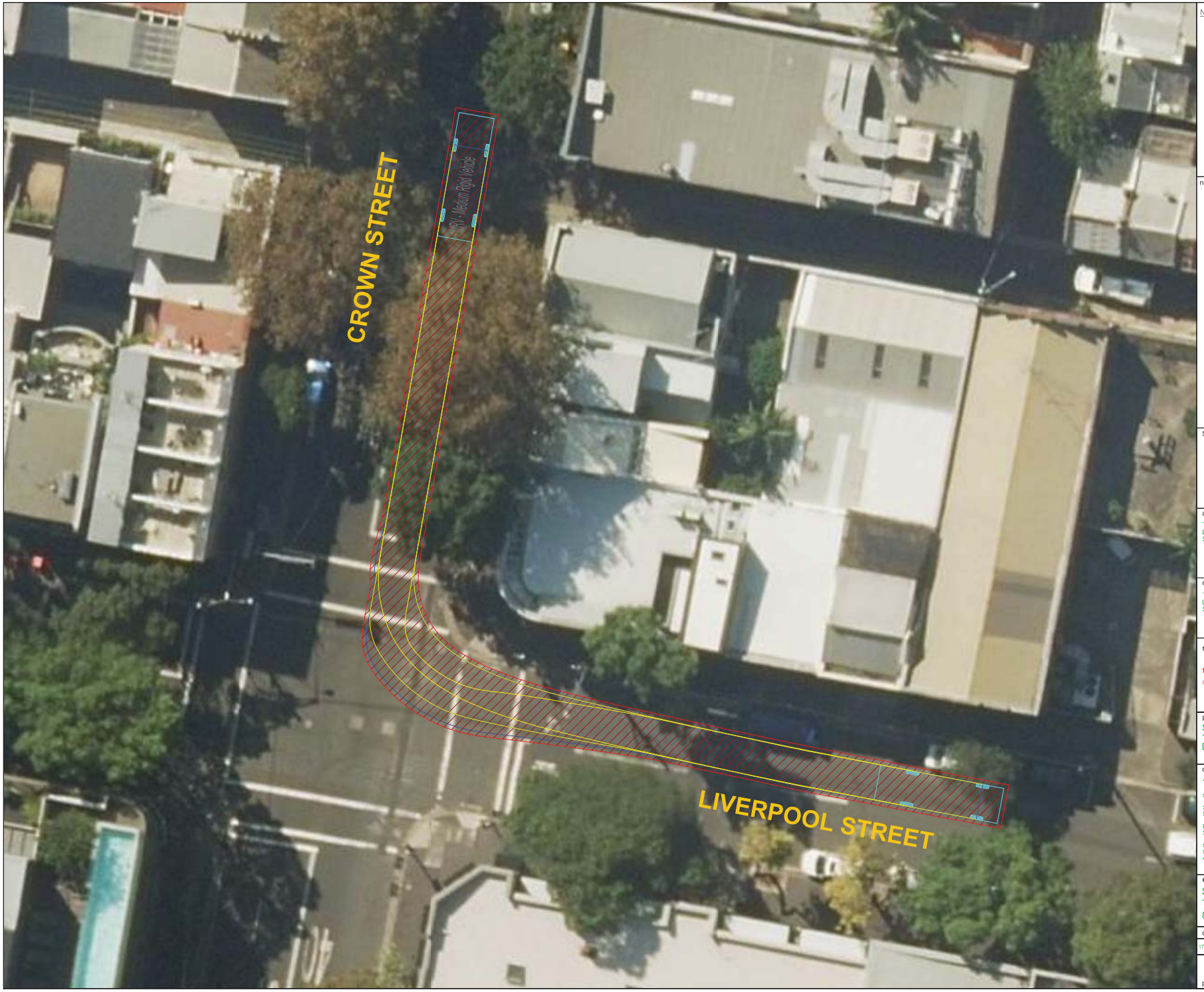
drawing title

Swept Path Analysis
Truck Routes - William St x Crown St
8.8m Medium Rigid Vehicle

drawn:	checked:	date:
NC	KB	31-10-2018

17.312s06v01 TRAFFIX - Truck Routes Swept Path Analysis.dwg

project no.	drawing phase.	drawing no.	rev
17.312	-	TX.02	-



Notes

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no.	revision note	by.	date

Swept Path Legend:

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- Clearance Envelope (300mm)

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drawing title

Swept Path Analysis
Truck Routes - Crown St x Liverpool St
8.8m Medium Rigid Vehicle

drawn:	checked:	date:
NC	KB	31-10-2018

17.312t06v01 TRAFFIX - Truck Routes Swept Path Analysis.dwg

17.312	-	TX.03	-
project no.	drawing phase.	drawing no.	rev