

Parramatta Road is shown in Figure 2.4.

### City Road

City Road is classified as a State Road in the Roads and Maritime Schedule of Classified Roads. It is the major road west of the site.

City Road is aligned in a north-east to south-west direction and is configured with three lanes in each direction in the vicinity of the site with an additional southbound right hand turning bay into Carillon Avenue. It has a speed limit of 60km/hr and is estimated to carry approximately 15,000 vehicles per day in each direction.

Kerbside parking is permitted outside of clearway times, between 6am-10am (northbound) and 3pm-7pm (southbound), subject to four-hour time restrictions.

City Road is shown in Figure 2.5.

### Carillon Avenue

Carillon Avenue is classified as a Major Local Road and is aligned in an east/west direction. It is a two-way road configured with one lane in each direction.

Kerbside parking is permitted, subject to two and four hour ticketed time restrictions.

Carrillon Avenue is shown in Figure 2.6.

### Missendon Road

Missendon Road is classified as a Major Local Road and is to the west of the site adjacent to the hospital aligned in a north/south direction. It is a two-way road configured with one lane in each direction. Kerbside parking is permitted, subject to two and four hour ticketed time restrictions on the west side of the road and on the east, parking is only for doctor's vehicles between 8:00am and 6:00pm.

Missendon Road is shown in Figure 2.7.

### Western Avenue

Western Avenue is an internal road within the USYD. Western Avenue is aligned in a north to south direction and runs from Carillon Avenue past the site and up to Parramatta Road. It is a two-way road configured with one lane in each direction.

No parking is permitted along Western Avenue.

Western Avenue is shown in Figure 2.8.

**Figure 2.4: Parramatta Road, Looking West**



**Figure 2.5: City Road, Looking North East**



Figure 2.6: Carillon Avenue, Looking East



Figure 2.7: Missendon Road, Looking North



Figure 2.8: Western Avenue, Looking North



Source: Google Street View (Accessed on 07/07/17)

## 2.3 Development Proposal

### 2.3.1 Land Uses

The proposal seeks approval to develop Stage 1 of the Health Precinct and involves the construction of a new eight-storey facility comprising:

- The relocation of the Faculty of Health Sciences from the Cumberland campus
- The relocation of the Faculty of Nursing and Midwifery from Mallett Street<sup>2</sup>
- The Sydney Medical School Central Clinical School (CCS) administration team (currently partially located within buildings belonging to RPAH and the Blackburn Building)
- The Health Sciences, Nursing and Medical Libraries, currently located at Cumberland, Mallett Street and in the Bosch 1B building.

It is understood that the facility will accommodate up to 683 full time staff and 2,636 students.

<sup>2</sup> Approximately 600m west of the site

### 2.3.2 Parking Arrangements

The proposed development will provide a total of 30 car parking spaces and a pick up/drop off space. The breakdown of car parking spaces is as follows:

- 29 car parking spaces (including 3 small car spaces) provided in the basement car park
- 1 DDA compliant space on Western Avenue
- 1 drop off/pick up space on Western Avenue

At this stage, it is proposed to allocate 10 of the parking spaces to staff, and 20 parking spaces to visitors of the medical centre.

### 2.3.3 Loading and Waste Collection Arrangements

It is proposed to provide a loading dock that can accommodate up to 1 x 8.8m medium rigid vehicle and 1 x 6.4m small rigid vehicle.

### 2.3.4 Access Arrangements

Access to the site is proposed via a new access way in place of the existing Blackburn Circuit. The access ramps down from Western Avenue and provides access to the loading dock, 29 spaces within a basement car park and access to the existing Bosch Building 1B loading dock at the southern boundary of the Stage 1 Health Precinct.

## 3. Car Parking & Vehicle Access Layout

### 3.1 Car Parking & Loading Layout

The proposed car parking layout has been assessed with respect to the relevant Australian Standards (AS2890.1:2004, AS/NZS 2890.6:2009 and AS 2890.2:2002). A summary of compliance is set out below.

- Car parking spaces will be 2.6m wide and 5.4m long, accessed via a 5.8m wide aisle. These dimensions satisfy the Australian Standards for User Class 3 (classification required for a medical centre).
- Small car spaces will be 2.3m wide and 5.0m long as per the Australian Standard requirement.
- It is recommended that wheel stops be installed 0.9m from the end of all car spaces with no kerb or a low kerb.
- The drop off/pick up space on Western Avenue will be 2.3m wide and 5.4m long accessed from a 3.0m wide aisle. These dimensions satisfy the Australian Standards and have been determined using swept path analysis.
- A DDA compliant car bay has been provided for people with a disability, which is located within the pick-up/drop-off facility and is 7.8m long and 3.2m wide and is compliant with the parallel parking bay Australian standard requirements.
- Columns will be located between 0.25m and 1.25m from the aisle end of car parking spaces.
- A minimum height clearance of 2.2m, measured from ground to the underside of any overhead obstructions, will be provided in both car park levels.
- A 5.7m wide turning bay is provided at the western end of the car park allowing vehicles to turn around if there is no available car space.
- The aisle extension at the end of the northern end of aisle car space is less than the required 1.0m. The provision of the turning area opposite this car space allows for the satisfactory egress of a vehicle from this car space.
- The loading dock can accommodate up to 1 x 8.8m medium rigid vehicle and 1 x 6.4m small rigid vehicle.
- The loading bay is designed to cater for all vehicles to reverse into and exit in a forward direction.
- Both loading vehicles will be required to utilise the full road width upon entry/exit to the loading dock. This is considered to be an acceptable outcome due to the infrequent vehicle movements within this area.
- Access to the existing loading dock for the Bosch Building 1b is maintained. The maximum size vehicle accessing this loading bay is an 8.8m medium rigid vehicle. This is required to utilise the paved area to the west of the three car bays that sit outside the main car park.

## 3.2 Vehicle Access Layout

The proposed vehicle access layout has been assessed in respect to the relevant Australian Standards. A summary of compliance is set out below.

- A maximum ramp grade of 1:4 is provided on all ramps. Grade transitions not exceeding 1:8 will be provided at the top and bottom of all ramps.
- A minimum height clearance of 2.2m will be provided on all ramps and within basements to be used by cars and a minimum height clearance of 4.5m for all areas used by larger vehicles, measured from the ground to the underside of any overhead obstructions. This provision satisfies the relevant Australian Standards.
- The vehicle access is 6.0m wide with 300mm clearance provided to walls.

A swept path assessment of the car park, loading dock and drop off/pick up facility is shown in Appendix B.

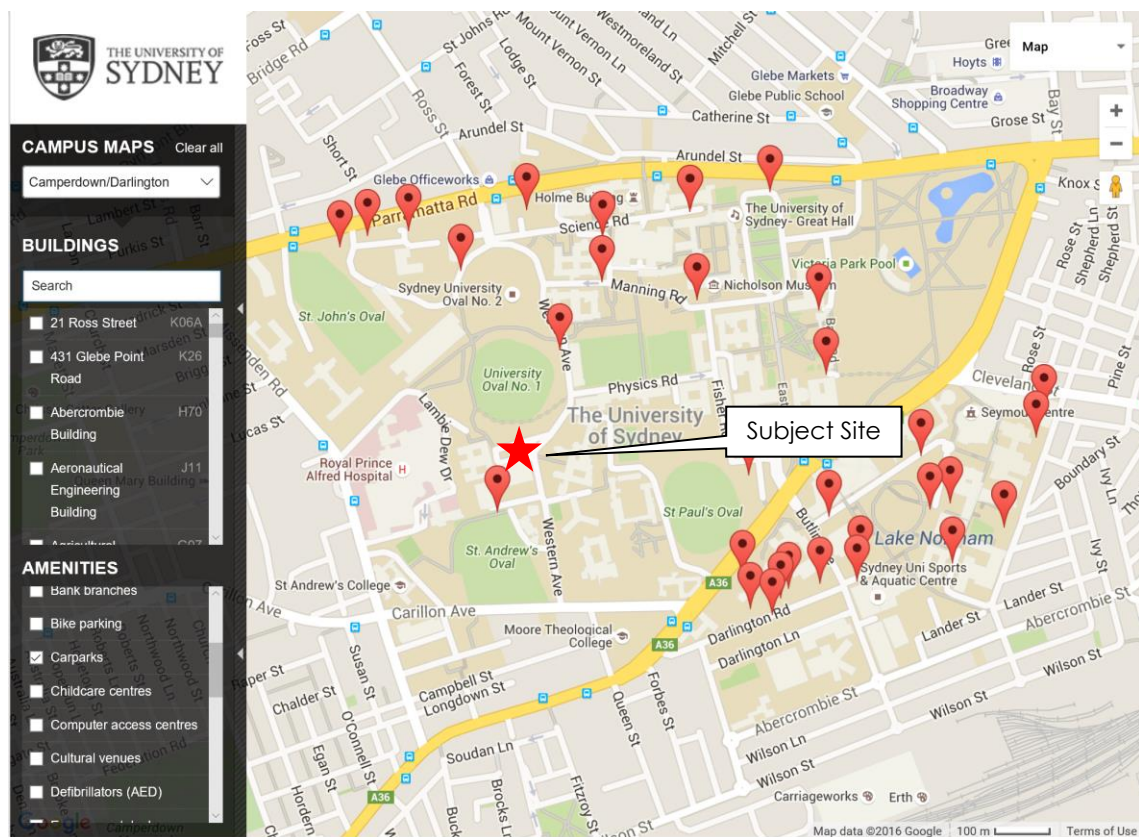
## 4. Transport and Accessibility Assessment

### 4.1 Existing Conditions

#### 4.1.1 Car Parking Provision

As outlined in the Sydney University Sustainable Transport & Mobility Plans (STAMP), there are 2,227 car parking spaces at the Camperdown-Darlington Campus with an additional 200 spaces to be provided as part of Transformational projects underway. These car spaces are located in various areas across the Campus, as shown in Figure 4.1.

Figure 4.1: Existing Car Park Locations



Source: <http://sydney.edu.au/maps/campuses/?area=CAMDAR>

The USYD Campus Improvement Plan (CIP) aims to change the distribution of car parking facilities by consolidating car parking facilities in defined precinct areas. In general, car parking areas will be relocated to peripheral locations in basement car parking facilities.

This plan outlines a precinct approach to the management of car parking. The CIP also suggests that internal streets within the Camperdown- Darlington campus will be limited, with the potential for Western Avenue in the centre of the campus to be limited to pedestrian movements only.

## 4.1.2 Road Network Operation

### Parramatta Road / Western Avenue

Western Avenue directly accesses Parramatta Road to the north and Western Avenue to the south.

A critical intersection within the vicinity of the site at the Campus is the Parramatta Road/Western Avenue intersection, which is located to the north of the subject site. The layout of the intersection is shown in Figure 4.2.

**Figure 4.2: Parramatta Road / Western Avenue Intersection Layout**



To ascertain the current operation of the above intersection, peak traffic flows were identified via surveys undertaken by the University on 2 August 2016 (during semester). The existing traffic survey results for the peak AM and PM period are presented in Figure 4.3 and Figure 4.4.

Figure 4.3: Parramatta/Western - Existing Traffic Flows (2015) – AM Peak Hour

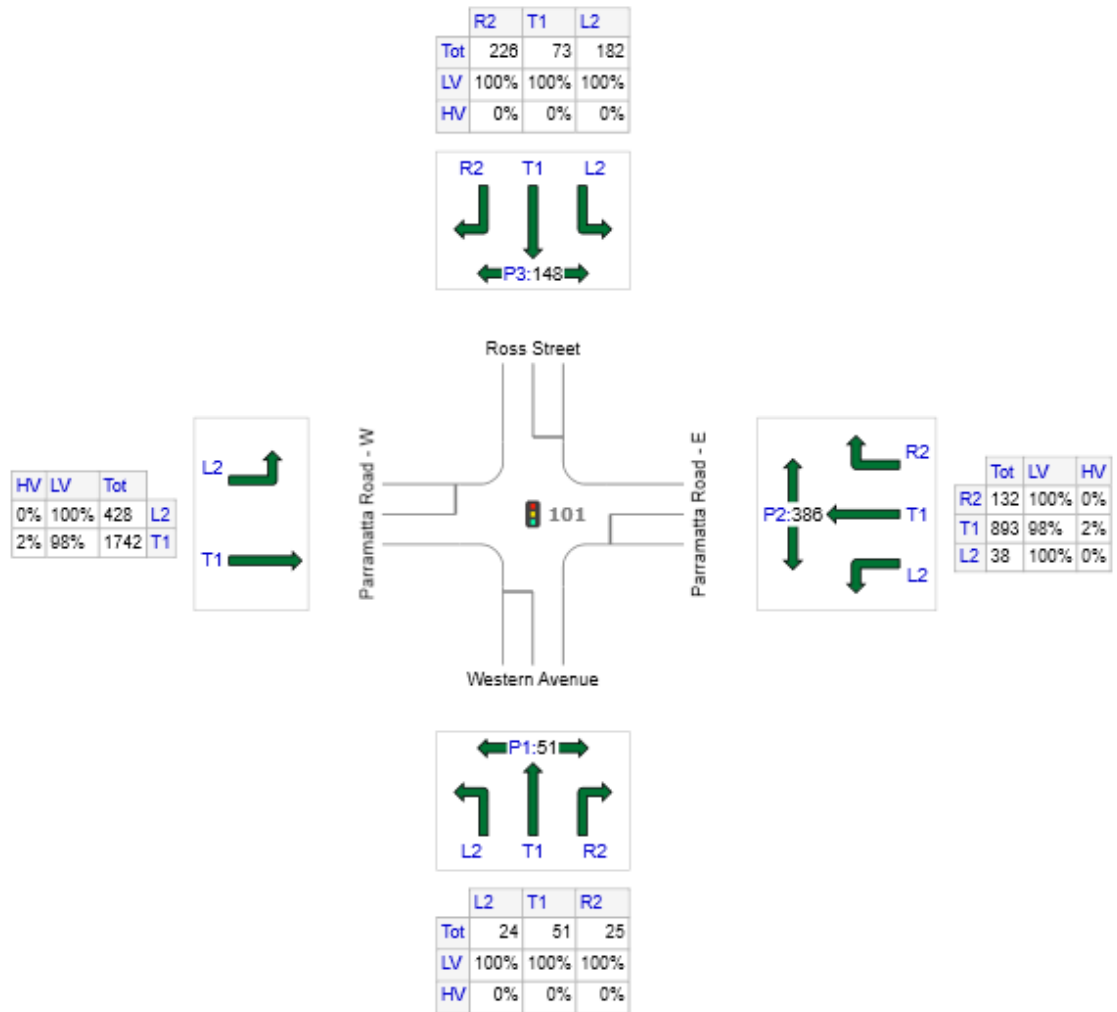
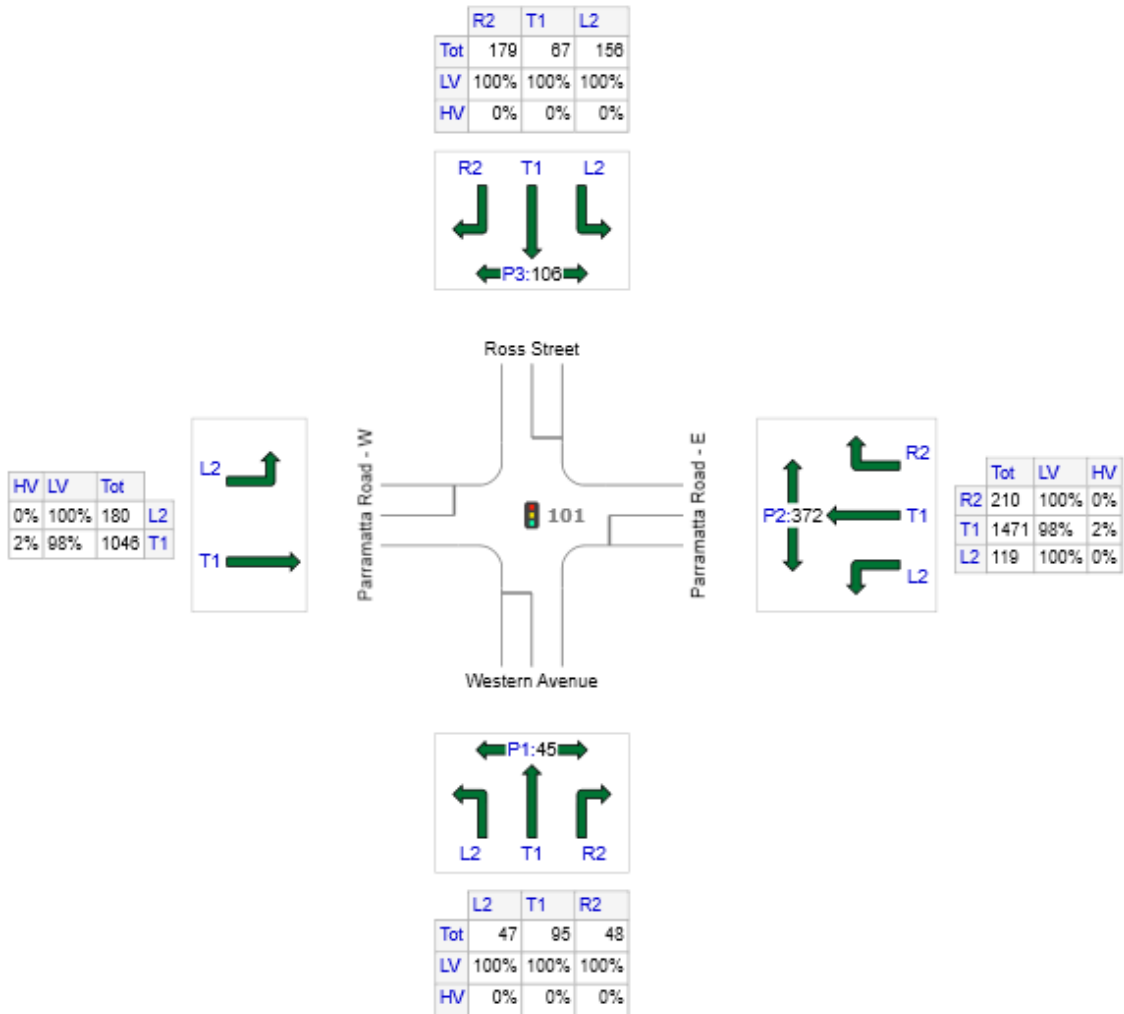


Figure 4.4: Parramatta/Western - Existing Traffic Flows (2015) – PM Peak Hour



The existing operation of the intersection was also modelled using the Sidra modelling software. Signal timings and vehicle queues were calibrated with on-site observations. The results of the analysis are presented in Table 4.1 and Table 4.2.

Table 4.1: Parramatta/Western - Existing Intersection Operation – AM Peak Hour

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Western Avenue											
1	L2	25	0.0	0.299	50.0	LOS D	5.3	37.1	0.89	0.74	33.4
2	T1	54	0.0	0.299	44.4	LOS D	5.3	37.1	0.89	0.74	33.9
3	R2	26	0.0	0.299	50.0	LOS D	5.3	37.1	0.89	0.74	33.5
Approach		105	0.0	0.299	47.2	LOS D	5.3	37.1	0.89	0.74	33.7
East: Parramatta Road - E											
4	L2	40	0.0	0.031	5.9	LOS A	0.0	0.3	0.02	0.58	53.3
5	T1	940	2.0	0.349	0.5	LOS A	0.8	5.8	0.03	0.03	59.5
6	R2	139	0.0	0.748	36.6	LOS C	5.6	39.4	0.98	0.80	36.8
Approach		1119	1.7	0.748	5.2	LOS A	5.6	39.4	0.15	0.14	55.1
North: Ross Street											
7	L2	192	0.0	0.529	29.2	LOS C	9.8	68.3	0.66	0.70	40.5
8	T1	77	0.0	0.529	23.7	LOS B	9.8	68.3	0.66	0.70	41.3
9	R2	238	0.0	0.966	61.7	LOS E	15.9	111.2	1.00	0.95	29.5
Approach		506	0.0	0.966	43.7	LOS D	15.9	111.2	0.82	0.82	34.6
West: Parramatta Road - W											
10	L2	451	0.0	0.485	6.4	LOS A	1.0	6.9	0.04	0.59	53.0
11	T1	1834	2.0	0.953	10.0	LOS A	21.9	155.9	0.33	0.37	51.5
Approach		2284	1.6	0.953	9.3	LOS A	21.9	155.9	0.27	0.41	51.8
All Vehicles		4015	1.4	0.966	13.5	LOS A	21.9	155.9	0.32	0.40	48.9

Table 4.2: Parramatta/Western - Existing Intersection Operation – PM Peak Hour

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Western Avenue											
1	L2	49	0.0	0.471	47.8	LOS D	10.1	70.8	0.91	0.78	34.0
2	T1	100	0.0	0.471	42.3	LOS C	10.1	70.8	0.91	0.78	34.6
3	R2	51	0.0	0.471	47.9	LOS D	10.1	70.8	0.91	0.78	34.2
Approach		200	0.0	0.471	45.1	LOS D	10.1	70.8	0.91	0.78	34.3
East: Parramatta Road - E											
4	L2	125	0.0	0.102	6.0	LOS A	0.2	1.1	0.02	0.58	53.3
5	T1	1548	2.0	0.611	0.7	LOS A	2.2	15.8	0.05	0.05	59.3
6	R2	221	0.0	0.752	29.3	LOS C	7.4	51.6	0.94	0.81	39.8
Approach		1895	1.6	0.752	4.4	LOS A	7.4	51.6	0.16	0.17	55.7
North: Ross Street											
7	L2	164	0.0	0.400	23.0	LOS B	6.5	45.4	0.50	0.63	43.5
8	T1	71	0.0	0.400	17.5	LOS B	6.5	45.4	0.50	0.63	44.4
9	R2	188	0.0	0.765	47.8	LOS D	10.3	71.9	0.94	0.83	33.2
Approach		423	0.0	0.765	33.1	LOS C	10.3	71.9	0.70	0.72	38.4
West: Parramatta Road - W											
10	L2	189	0.0	0.255	14.1	LOS A	2.8	19.3	0.27	0.65	47.7
11	T1	1101	2.0	0.715	10.8	LOS A	15.0	106.6	0.50	0.45	51.0
Approach		1291	1.7	0.715	11.3	LOS A	15.0	106.6	0.47	0.48	50.5
All Vehicles		3808	1.4	0.765	12.1	LOS A	15.0	106.6	0.36	0.37	49.8

Table 4.1 and Table 4.3 indicate that the intersection currently operates satisfactorily during both the AM and PM peak periods, with a Level of Service of A in each period.

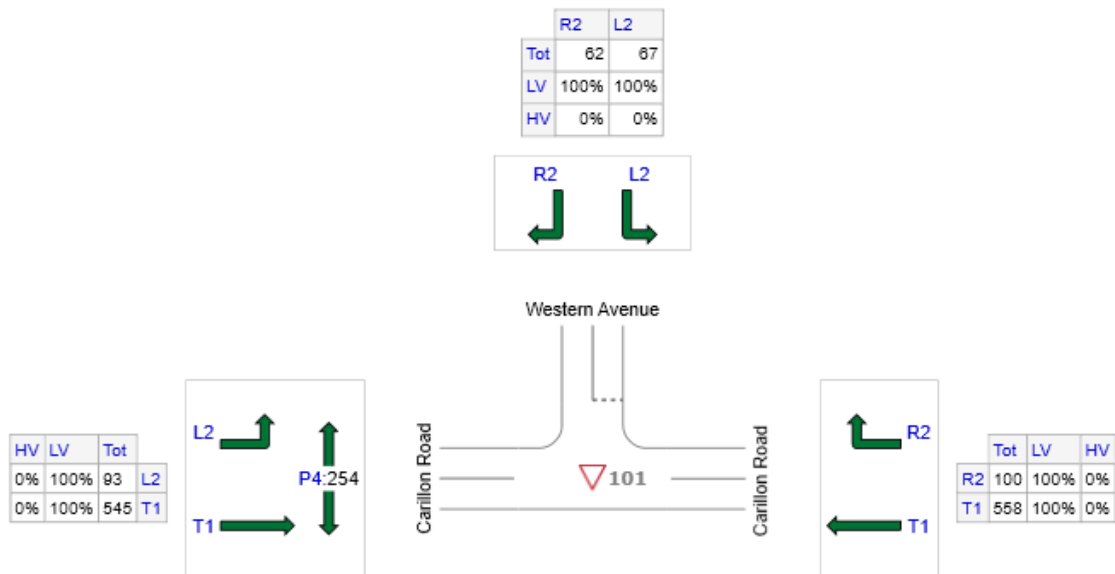
Notwithstanding the above, it is noted that the intersection operates as part of a co-ordinated traffic signal network along Parramatta Road. In this respect, it is acknowledged that vehicle congestion does occur during peak periods both towards the city in the morning (i.e. inbound on

Parramatta Road) and outbound in the afternoon / evening. While broader network congestion does occur, this section of Parramatta Road operates relatively efficiently with vehicles able to enter and exit the Campus satisfactorily via Western Avenue.

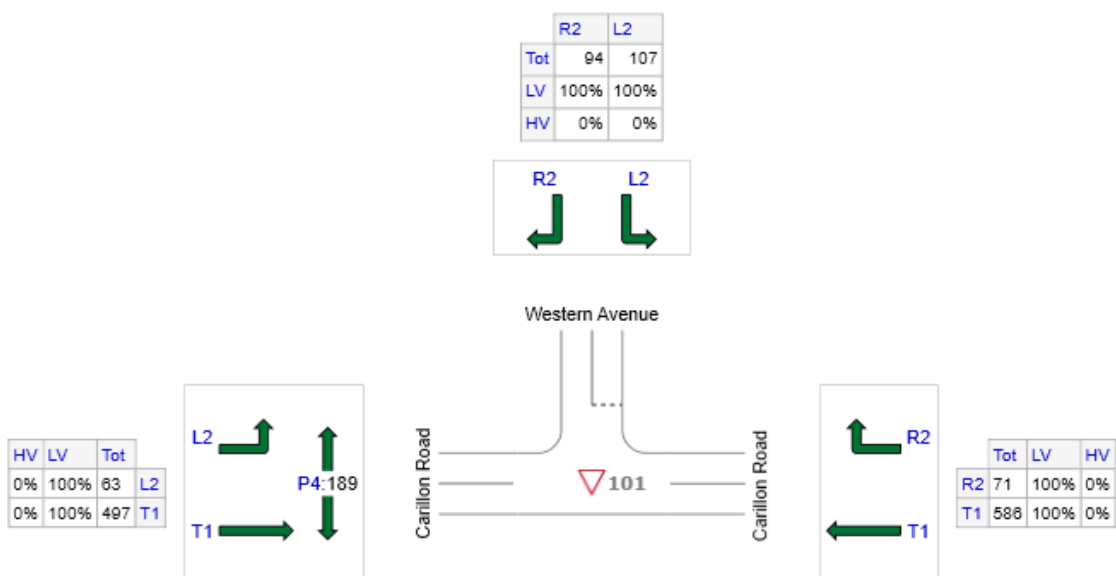
### Carillon Avenue / Western Avenue Intersection

The intersection of Western Avenue and Carillon Avenue is to the south of the site and operates as a Give Way controlled T intersection. As outlined previously, GTA were supplied traffic volume data from surveys undertaken by the University on 2 August 2016 (during semester). The existing traffic survey results for the peak AM and PM period are presented in Figure 4.5 and Figure 4.6.

**Figure 4.5: Carillon/Western - Existing Traffic Flows (2016) – AM Peak Hour**



**Figure 4.6: Carillon/Western - Existing Traffic Flows (2016) – PM Peak Hour**



The operation of the existing intersection has been modelled for the intersection using Sidra. The results of the analysis are presented in Table 4.3 and Table 4.4.

**Table 4.3: Carillon/Western - Existing Intersection Operation – AM Peak Hour (2016)**

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Carillon Road											
5	T1	587	0.0	0.811	11.0	LOS B	16.3	114.4	0.83	1.16	49.9
6	R2	105	0.0	0.811	19.3	LOS C	16.3	114.4	0.83	1.16	48.3
Approach		693	0.0	0.811	12.2	NA	16.3	114.4	0.83	1.16	49.7
North: Western Avenue											
7	L2	71	0.0	0.486	12.7	LOS B	1.9	13.4	0.81	1.03	42.9
9	R2	65	0.0	0.486	33.3	LOS D	1.9	13.4	0.81	1.03	42.5
Approach		136	0.0	0.486	22.6	LOS C	1.9	13.4	0.81	1.03	42.7
West: Carillon Road											
10	L2	98	0.0	0.759	12.6	LOS B	14.0	97.8	0.80	1.00	50.6
11	T1	574	0.0	0.759	9.1	LOS A	14.0	97.8	0.80	1.00	51.8
Approach		672	0.0	0.759	9.6	NA	14.0	97.8	0.80	1.00	51.6
All Vehicles		1500	0.0	0.811	12.0	NA	16.3	114.4	0.81	1.08	49.8

**Table 4.4: Carillon/Western - Existing Intersection Operation – PM Peak Hour (2016)**

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Carillon Road											
5	T1	617	0.0	0.739	7.0	LOS A	13.3	93.4	0.72	0.82	53.1
6	R2	75	0.0	0.739	15.3	LOS C	13.3	93.4	0.72	0.82	51.3
Approach		692	0.0	0.739	7.9	NA	13.3	93.4	0.72	0.82	52.9
North: Western Avenue											
7	L2	113	0.0	0.603	13.6	LOS B	2.9	20.6	0.79	1.10	43.4
9	R2	99	0.0	0.603	30.5	LOS D	2.9	20.6	0.79	1.10	43.1
Approach		212	0.0	0.603	21.5	LOS C	2.9	20.6	0.79	1.10	43.3
West: Carillon Road											
10	L2	66	0.0	0.616	8.8	LOS A	7.8	54.9	0.62	0.59	54.0
11	T1	523	0.0	0.616	4.5	LOS A	7.8	54.9	0.62	0.59	55.4
Approach		589	0.0	0.616	5.0	NA	7.8	54.9	0.62	0.59	55.3
All Vehicles		1493	0.0	0.739	8.7	NA	13.3	93.4	0.69	0.77	52.1

Table 4.3 and Table 4.4 indicate that the intersection currently operates satisfactorily during both the AM and PM peak periods, with acceptable queues noting the zebra crossing which gives pedestrians priority on the western leg of the intersection.

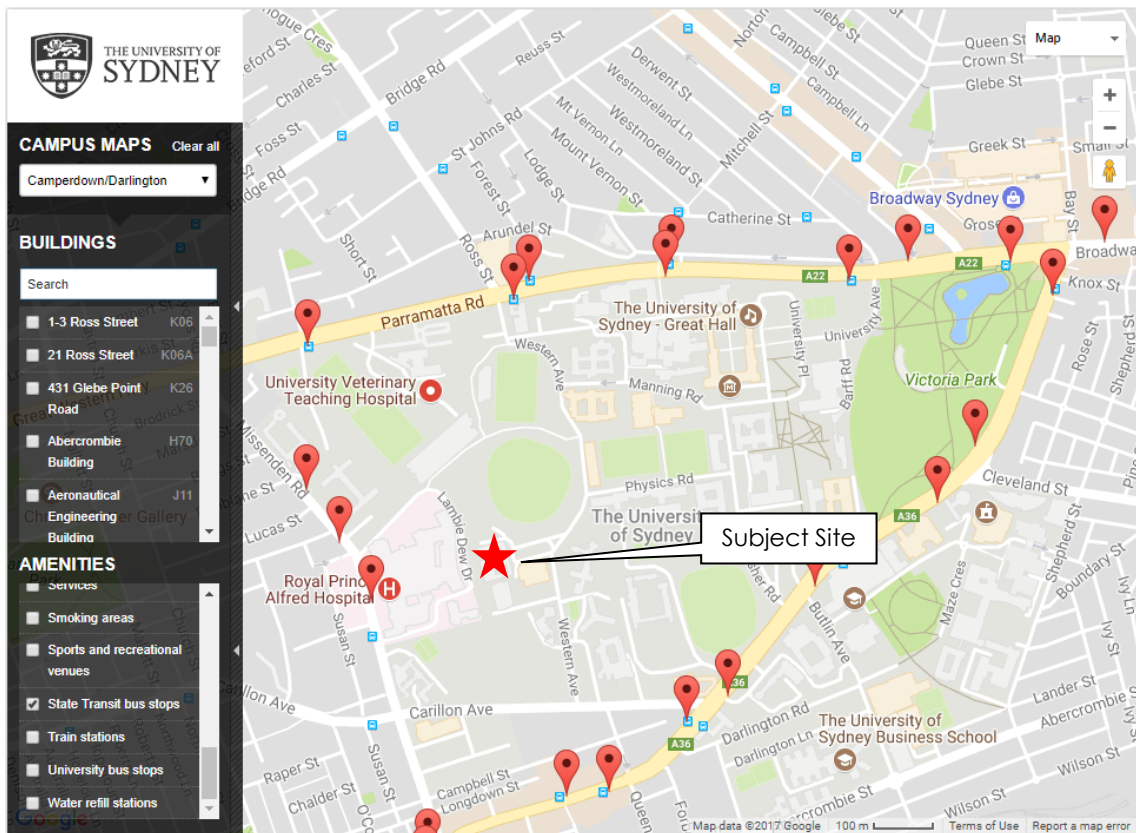
### 4.1.3 Public Transport Accessibility

Public transport to the Campus is primarily provided by bus and train services.

The Arup Access Strategy report (December 2013) indicates that some 53% of the Campus' mode share is via public transport.

In the vicinity of the site, access to public transport is largely reliant on the high frequency bus route services along the Parramatta Road corridor. There are many bus stops along Parramatta Road within walking distance of the site which provide high frequency connecting services between the western suburbs and the CBD. The bus stops in the vicinity of the site are shown in Figure 4.7.

Figure 4.7: Bus Stop Locations



Source: <http://sydney.edu.au/maps/campuses/?area=CAMDAR> (accessed 07/07/17)

A review of the public transport available in the vicinity of the site is summarised in Table 4.5.

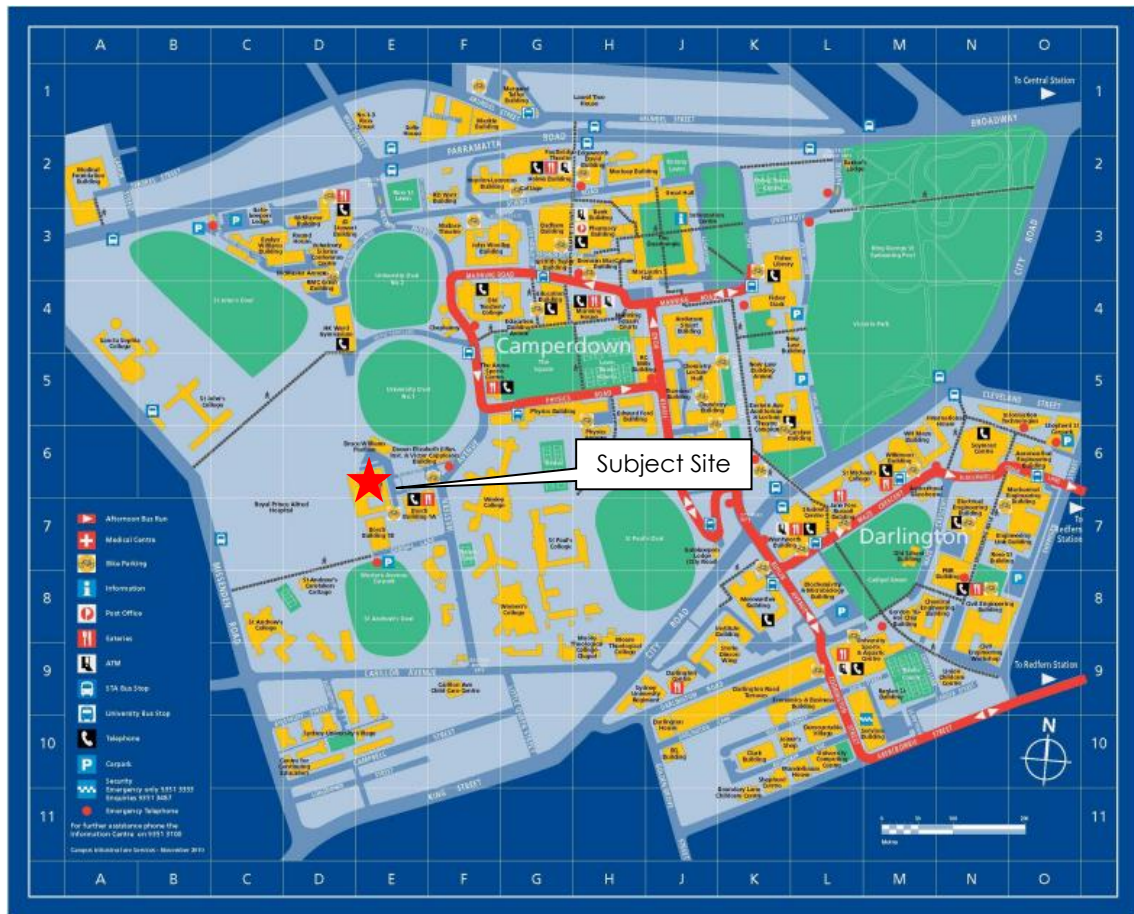
Table 4.5: Public Transport Provision

Service	Route #	Route Description	Location of Stop	Distance to Nearest Stop	Frequency On/Off Peak
Bus	413	City to Campsie Station	Parramatta Road adjacent to Western Avenue	500m	10 minutes peak / 15 minutes off peak
	436	City to Chiswick			10 minutes peak / 20 minutes off peak
	438	City to Abbotsford			10 minutes peak / 20 minutes off peak
	439	City to Mortlake			5-10 minutes peak / 15 minutes off peak
	440	City to Rozelle			10 minutes peak / 20 minutes off peak
	461	City to Burwood			5-10 minutes peak / 15 minutes off peak
	480	City to Strathfield Station			10 minutes peak / 20 minutes off peak
	483	City to Strathfield Station			10 minutes peak / 20 minutes off peak
Bus	352	Bondi Junction to Marrickville Metro via Oxford Street	City Road opposite Carillion Avenue	650m	20 minutes peak / 30 minutes off peak
	370	Leichardt Marketplace to Coogee			10 minutes peak / 20 minutes off peak
	422	City to Kogarah			5-10 minutes peak / 20 minutes off peak

Service	Route #	Route Description	Location of Stop	Distance to Nearest Stop	Frequency On/Off Peak
	423	City to Kingsgrove via central station and Newtown			Every 10 minutes
	426	City to Dulwich Hill			10 minutes peak / 20 minutes off peak
	428	City to Dulwich Hill			5-10 minutes peak / 15 minutes off peak
Bus	M30	Sydenham to Mosman	City Road opposite Carillion Avenue	650m	10 minutes peak / 15 minutes off peak
	L23	City to Kingsgrove	City Road near Butlin Avenue	550m	Every 15 minutes 4:30pm – 6:30pm
	L28	City to Canterbury			Every 15 minutes 4:30pm – 6:30pm
	N10	City to Sutherland			Hourly 1am – 5am
	N30	City to Macarthur			Every Half Hour 1am-5am
	N40	City to East Hills			Every Half Hour 12am-5am
	412	City to Campsie Station			Outside RPAH on Missendon St
Train	n/a	All except airport branch of the Airport, Inner West & South Line and the Cumberland Line	Redfern Station	1600m	Frequency is less than 5 minutes
		All Lines	Central Station	2400m	Frequency is less than 5 minutes

As shown in Figure 4.8 there is also a free bus that is provided to staff and students that allows them to travel free throughout the campus. This bus travels within 150m of the proposed site.

Figure 4.8: Camperdown and Darlington Campus, Bus Route



[Source: <http://sydney.edu.au/dam/corporate/documents/campus-life/travel-campus/Camperdown-Darlington.pdf>]

Other than buses, train usage is a key public transport mode for the Campus. The site is not located within close proximity of a particular railway station; however, it is known that Redfern Station and Central Station are most commonly used while travelling to and from the University.

#### 4.1.4 Pedestrian Movements

The Access Strategy Assessment prepared by Arup (December 2013) reported a campus wide mode share of active travel (pedestrians and cyclists) of 26%.

USYD has adequate pedestrian footpaths throughout the campus linking the site to the rest of the surrounding infrastructure.

Pedestrian paths are located as follows:

- Western Avenue (2 sides) - 2m wide path, providing access to the site
- Parramatta Road (2 sides) - 3m wide path
- Carillon Avenue (2 sides) - 2m wide path.

Safe crossing points in vicinity of the site include the following pedestrian crossings:

- North to south leg of the Carillon Avenue/Western Avenue intersection has a zebra crossing.
- East to west and north to south legs of the Parramatta Road/Western Avenue intersection.
- East to west crossing along Western Avenue adjacent to the site.

## 4.1.5 Cycling Movements

Cycling as a mode of transport has gained popularity in recent years at the Campus.

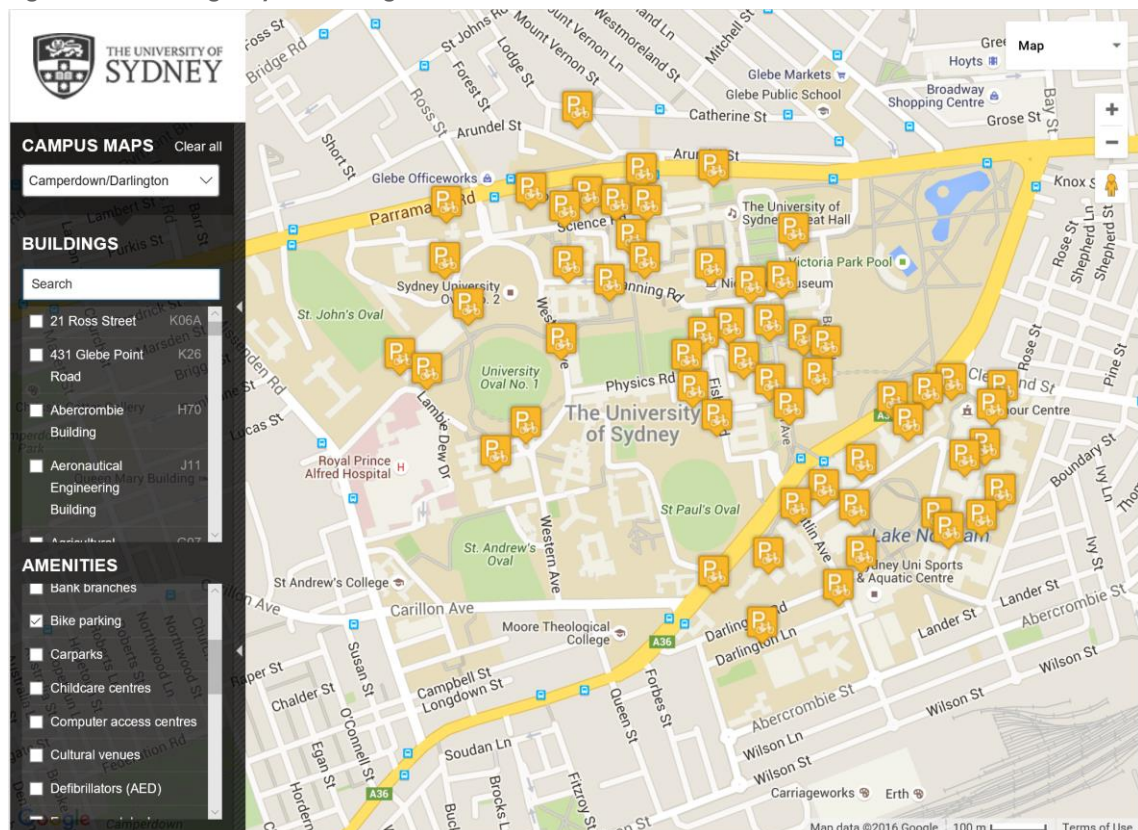
It is understood that this is largely a reflection of implementing site specific policies and measures to promote and achieve mode shifts to cycling. The University promotes of bicycle usage on their website, which includes details on:

- Where to ride
- How to ride safely
- Where to park
- Where to shower and change
- Discounts for Bicycle usage

The existing bicycle parking facilities at the Campus is shown in Figure 4.9 and illustrates that bicycle parking is provided extensively in the vicinity of the site.

It is further noted that the Arup Access Strategy report indicates that the University of Sydney currently caters for some 1,300 bicycles' parking/storage across the campus. It is understood that these bike racks are currently heavily utilised during the term and represents approximately, 3% of student's mode share and 10% of staff's mode share.

**Figure 4.9: Existing Bicycle Parking Locations**



Source: <http://sydney.edu.au/maps/campuses/?area=CAMDAR>

## 4.2 Development Impacts

### 4.2.1 Traffic Impacts

#### Traffic Impacts

The Stage 1 Health Precinct Building proposes a net increase in parking of 22 spaces. It is conservatively assumed that each new car space will generate a vehicle movement in the AM peak resulting in up to an additional 22 vehicle movements to the site in the AM peak. In the PM peak, it is conservatively assumed that each of the new car spaces is turned over, resulting in an additional 22 vehicle movements to the site, and 22 vehicle movements away from the site.

Estimates of peak hour volumes resulting from the proposal are set out in Table 4.6.

**Table 4.6: Traffic Generation Estimates**

Period	Vehicle Movements		
	In	Out	Total
AM Peak	22/hr	0/hr	22/hr
PM Peak	22/hr	22/hr	44/hr

As both the Faculty of Health Science and Faculty of Nursing and Midwifery are new faculties to the campus, there may be additional demand for car parking in the wider campus.

Notwithstanding, it is understood that there is generally limited availability of car parking within the campus and therefore any additional traffic generated by the Health Precinct to the wider campus has not been considered as part of this assessment.

#### Traffic Distribution

As detailed earlier, the proposal will generate 22 additional vehicle movements in the AM peak and 44 additional vehicle movements in the PM peak.

It is assumed that this traffic is distributed evenly to the north and south of the site. This assumption is consistent with the existing traffic flow on Western Avenue as detailed in the traffic surveys supplied to GTA.

Based on the above, Figure 4.10 and Figure 4.11 have been prepared to show the estimated marginal increase in turning movements in the vicinity of the subject property following full site development.

Figure 4.10: AM Peak Hour Site Generated Traffic Volumes

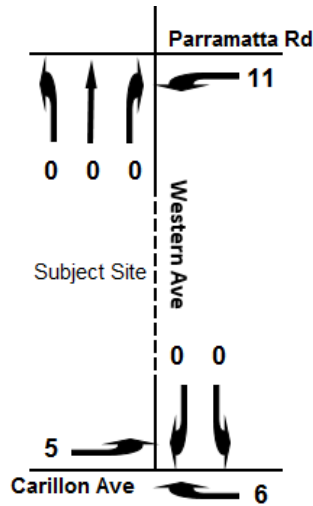
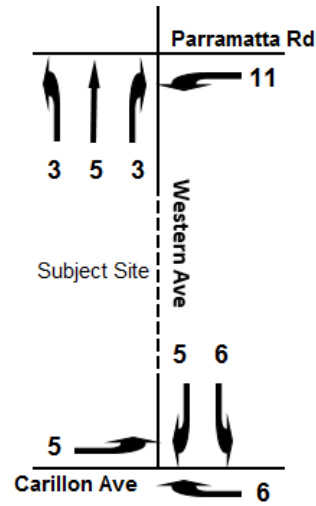


Figure 4.11: PM Peak Hour Site Generated Traffic Volumes



### Traffic Impact

The post development traffic volumes have been modelled using the Sidra modelling software. The results of the analysis are presented in Table 4.7 to Table 4.10.

Table 4.7: Parramatta/Western – Post Development Intersection Operation – AM Peak Hour

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Western Avenue											
1	L2	25	0.0	0.299	50.0	LOS D	5.3	37.1	0.89	0.74	33.4
2	T1	54	0.0	0.299	44.4	LOS D	5.3	37.1	0.89	0.74	33.9
3	R2	26	0.0	0.299	50.0	LOS D	5.3	37.1	0.89	0.74	33.5
Approach		105	0.0	0.299	47.2	LOS D	5.3	37.1	0.89	0.74	33.7
East: Parramatta Road - E											
4	L2	52	0.0	0.040	5.9	LOS A	0.1	0.4	0.02	0.58	53.3
5	T1	940	2.0	0.349	0.5	LOS A	0.8	5.8	0.03	0.03	59.5
6	R2	139	0.0	0.748	36.6	LOS C	5.6	39.4	0.98	0.80	36.8
Approach		1131	1.7	0.748	5.2	LOS A	5.6	39.4	0.15	0.15	55.1
North: Ross Street											
7	L2	192	0.0	0.529	29.2	LOS C	9.8	68.3	0.66	0.70	40.5
8	T1	77	0.0	0.529	23.7	LOS B	9.8	68.3	0.66	0.70	41.3
9	R2	238	0.0	0.966	61.7	LOS E	15.9	111.2	1.00	0.95	29.5
Approach		506	0.0	0.966	43.7	LOS D	15.9	111.2	0.82	0.82	34.6
West: Parramatta Road - W											
10	L2	451	0.0	0.485	6.4	LOS A	1.0	6.9	0.04	0.59	53.0
11	T1	1834	2.0	0.953	10.0	LOS A	21.9	155.9	0.33	0.37	51.5
Approach		2284	1.6	0.953	9.3	LOS A	21.9	155.9	0.27	0.41	51.8
All Vehicles		4026	1.4	0.966	13.5	LOS A	21.9	155.9	0.32	0.40	48.9

Table 4.8: Parramatta/Western – Post Development Intersection Operation – PM Peak Hour

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Western Avenue											
1	L2	53	0.0	0.482	47.2	LOS D	10.6	74.5	0.90	0.78	34.2
2	T1	105	0.0	0.482	41.6	LOS C	10.6	74.5	0.90	0.78	34.8
3	R2	54	0.0	0.482	47.2	LOS D	10.6	74.5	0.90	0.78	34.4
Approach		212	0.0	0.482	44.4	LOS D	10.6	74.5	0.90	0.78	34.5
East: Parramatta Road - E											
4	L2	137	0.0	0.113	6.0	LOS A	0.2	1.2	0.02	0.58	53.3
5	T1	1548	2.0	0.619	0.7	LOS A	2.3	16.1	0.06	0.05	59.3
6	R2	221	0.0	0.752	29.1	LOS C	7.3	50.8	0.94	0.81	39.8
Approach		1906	1.6	0.752	4.4	LOS A	7.3	50.8	0.16	0.18	55.7
North: Ross Street											
7	L2	164	0.0	0.390	22.0	LOS B	6.2	43.2	0.48	0.62	44.1
8	T1	71	0.0	0.390	16.4	LOS B	6.2	43.2	0.48	0.62	45.0
9	R2	188	0.0	0.752	46.4	LOS D	10.1	70.7	0.93	0.83	33.7
Approach		423	0.0	0.752	31.9	LOS C	10.1	70.7	0.68	0.71	38.9
West: Parramatta Road - W											
10	L2	189	0.0	0.260	14.9	LOS B	3.0	20.9	0.29	0.65	47.1
11	T1	1101	2.0	0.730	11.9	LOS A	16.2	115.5	0.54	0.48	50.2
Approach		1291	1.7	0.730	12.3	LOS A	16.2	115.5	0.51	0.51	49.8
All Vehicles		3832	1.4	0.752	12.3	LOS A	16.2	115.5	0.37	0.38	49.6

Table 4.9: Carillon/Western – Post Development Intersection Operation – AM Peak Hour

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Carillon Road											
5	T1	587	0.0	0.819	11.3	LOS B	16.9	118.5	0.83	1.19	49.6
6	R2	112	0.0	0.819	19.8	LOS C	16.9	118.5	0.83	1.19	48.0
Approach		699	0.0	0.819	12.7	NA	16.9	118.5	0.83	1.19	49.3
North: Western Avenue											
7	L2	71	0.0	0.494	12.9	LOS B	2.0	13.7	0.81	1.04	42.6
9	R2	65	0.0	0.494	34.1	LOS D	2.0	13.7	0.81	1.04	42.3
Approach		136	0.0	0.494	23.1	LOS C	2.0	13.7	0.81	1.04	42.5
West: Carillon Road											
10	L2	103	0.0	0.763	12.7	LOS B	14.3	100.0	0.81	1.01	50.5
11	T1	574	0.0	0.763	9.2	LOS A	14.3	100.0	0.81	1.01	51.7
Approach		677	0.0	0.763	9.8	NA	14.3	100.0	0.81	1.01	51.5
All Vehicles		1512	0.0	0.819	12.3	NA	16.9	118.5	0.82	1.09	49.6

Table 4.10: Carillon/Western – Post Development Intersection Operation – PM Peak Hour

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
East: Carillon Road												
5	T1	617	0.0	0.746	7.2	LOS A	13.7	96.0	0.72	0.84	52.9	
6	R2	81	0.0	0.746	15.6	LOS C	13.7	96.0	0.72	0.84	51.1	
Approach		698	0.0	0.746	8.2	NA	13.7	96.0	0.72	0.84	52.7	
North: Western Avenue												
7	L2	108	0.0	0.635	14.6	LOS B	3.2	22.1	0.80	1.12	42.6	
9	R2	104	0.0	0.635	32.0	LOS D	3.2	22.1	0.80	1.12	42.3	
Approach		213	0.0	0.635	23.1	LOS C	3.2	22.1	0.80	1.12	42.4	
West: Carillon Road												
10	L2	72	0.0	0.621	8.9	LOS A	8.0	56.0	0.62	0.60	54.0	
11	T1	523	0.0	0.621	4.6	LOS A	8.0	56.0	0.62	0.60	55.4	
Approach		595	0.0	0.621	5.1	NA	8.0	56.0	0.62	0.60	55.2	
All Vehicles		1505	0.0	0.746	9.1	NA	13.7	96.0	0.69	0.78	51.8	

The results show that against existing traffic volumes in the vicinity of the site, the additional traffic generated by the proposed development is marginal and has a negligible impact on the intersection operations. The additional traffic could not be expected to compromise the safety or function of the surrounding road network and is indeed less than the daily fluctuation of traffic across each peak hour.

As previously mentioned, the CIP suggests that internal streets within the Camperdown-Darlington campus will be limited, with the potential for Western Avenue in the centre of the campus to be limited to pedestrian movements only. The potential change in traffic movements associated with this proposal will need to be considered as part of any future campus wide assessment and has therefore not be considered as part of this assessment.

#### 4.2.2 Car Parking Provision

As detailed earlier, the proposal results in a net car parking increase of 22 car spaces. It is noted that there are a number of NSW State Government and City of Sydney transport related policies which sets out key strategic transport objectives for new developments. These include, but are not limited to, the NSW Long Term Transport Master Plan, Sydney's Cycling Future 2013 and Sydney's Walking Future, as well as City of Sydney's LEP (2012) which limits the provision of onsite car parking. Furthermore, it is noted that the University of Sydney has its own site specific transport objectives. In our view, the proposed provision of 22 additional car spaces is consistent with these policies noting that car parking is being managed using a precinct wide campus approach.

#### 4.2.3 Public Transport Accessibility

As outlined earlier, the proposal has excellent access to nearby public transport services, with bus services in particular located within a short walk of the site.

It is further noted that the University of Sydney is very pro-active with regard to travel demand management and undertakes the task of encouraging the use of public transport on a campus wide approach. It is expected that the travel demands associated with the Health Precinct will be included in and addressed by the University's broader travel demand management policies (i.e future Sustainable Transport & Mobility Plans (STAMP)).