

Health Infrastructure

**Blacktown Hospital Stage 1 New  
Main Hospital Building**

**Construction Traffic Management  
Plan**

CTMP-01

Rev B | 16 August 2012

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 221031

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# Document Verification

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## Contents

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	Page
<b>1 Introduction</b>	<b>1</b>
1.1 Director General's Environmental Assessment Requirements	1
1.2 Site location	1
<b>2 Description of Proposed Works</b>	<b>2</b>
2.1 Overview	2
2.2 Construction programme	2
<b>3 Existing Site Traffic</b>	<b>3</b>
3.1 Road network	3
3.2 Traffic flow data	4
3.3 Public transport availability	5
3.4 Pedestrian and cycle facilities and conditions	7
<b>4 Impact of Proposed Works</b>	<b>8</b>
4.1 Proposed construction access	9
4.2 Heavy vehicle routes to site	13
4.3 Construction traffic volumes	14
4.4 Cumulative impact of existing site and construction traffic	14
4.5 Parking	14
<b>5 Measures to Ameliorate Impacts</b>	<b>15</b>
5.1 Blacktown Road operations during construction	15
5.2 Parking	15
5.3 Pedestrians	16
5.4 Driver Code of Conduct	16
5.5 Traffic Control Plans	16
<b>6 Public Transport Services</b>	<b>16</b>
<b>7 Provisions for Emergency Vehicles</b>	<b>17</b>
<b>8 Public Consultation</b>	<b>17</b>
<b>9 Conclusions</b>	<b>17</b>

## Tables

Table 1	Construction staging
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Table 2	Project timeframe for works
Table 3	Estimated construction traffic volumes

## Figures

Figure 1	Site location
Figure 2	Existing access arrangements and intersection control
Figure 3	Panorama Parade intersections with Blacktown Road and hospital entrance
Figure 4	Busways 721 map
Figure 5	Hillsbus bus network map
Figure 6	Blacktown CBD Shuttle route map
Figure 7	Blacktown City Council Bike Plan
Figure 8	Vehicle routes within Blacktown Hospital during construction
Figure 9	Temporary Construction Access
Figure 10	Sight Stopping Distance (Austroads)
Figure 11	Available sight distance (Source: Google Maps)
Figure 12	Minimum Safe Intersection Distance (MSID) (Austroads)
Figure 13	MSID distance from proposed left out (Source: Google Maps)
Figure 14	Sight distance looking east towards the Wall Park Ave intersection
Figure 15	Left in / Left out routes (Source: Google Maps)
Figure 16	Trees to be trimmed

## Appendices

### Appendix A

Traffic Volumes

### Appendix B

Turning Path Analysis

### Appendix C

Construction Vehicle Parking

# 1 Introduction

Planning is currently underway for a major redevelopment of Blacktown Hospital. The expansion consists of four components: a partial refurbishment of the existing main hospital, a new hospital facility, a multistorey car park and a new one storey mental health unit. These developments are subject to a separate approval.

This CTMP address traffic management associated with the Stage 1 Building Works and the cumulative impacts of the works subject to other approvals.

## 1.1 Director General's Environmental Assessment Requirements

This report has been prepared to address the following Director General's Environmental Assessment Requirements relating to Transport Accessibility during construction of the hospital.

### 7 Transport Accessibility (Construction)

- Detail access arrangements at all stages of construction and measures to mitigate any associated pedestrian, cycleway or traffic impacts.
- Details regarding car parking arrangements during construction, including the displacement of visitor and patient car parking. Alternative off-site arrangements should be made for staff and construction workers.

## 1.2 Site location

The hospital campus is approximately 1.2km from Blacktown Railway Station and the Blacktown city centre as shown in Figure 1.

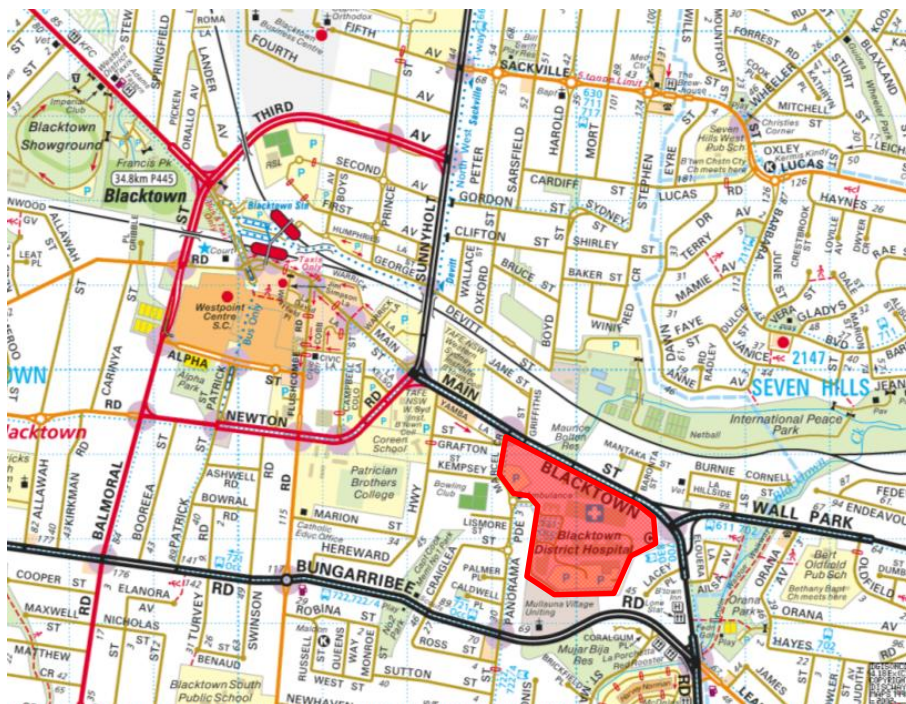


Figure 1 Site location

## 2 Description of Proposed Works

### 2.1 Overview

The Main Hospital building development works will commence in 2013, following the completion of the Civil Works and construction of the MSCP. The works include the removal of the temporary access arrangements on the internal roads and the implementation of the future internal road arrangement, linking the hospital to the new access opposite Baronta Street.

### 2.2 Construction programme

The construction process is proposed to occur in stages of varying length as set out in Table 1. The works timeframe is outlined in Table 2 and involve the construction of the Stage 1 Building and removal of temporary access roads and construction of the P11 car park.

Car parking spaces lost with the construction of the Stage 1 building will be supplemented with a temporary off-site car park. In Phase 5a, construction begins on the MSCP. When the MSCP is complete, the temporary off-site car park is closed and hospital vehicles will be able to park within the MSCP for the final phases of the Stage 1 building works.

Table 1 Construction staging

Stage of works	Time (weeks)
Phase 1 – Relocate Temp Accommodation	4
Phase 2 – Enabling works (including new access)	16
Phase 3a – Excavation of MSCP and construction of the BMHU	16
Phase 3b – New major loop road	4
Phase 4 – Stage 1 building Early Works and construction of MSCP and BMHU	12
Phase 5 – MSCP and BMHU construction	44
Phase 6 – Stage 1 building construction	52

Table 2 Project timeframe for works

Construction Phase	2012	2013	2014	2015
Phase 1	■			
Phase 2		■		
Phase 3a		■		
Phase 3b		■		
Phase 4		■	■	
Phase 5		■	■	■
Phase 6		■	■	■



## 3 Existing Site Traffic

### 3.1 Road network

The Blacktown Hospital site is generally bounded by Blacktown Road to the north and Bungarribee Road to the south, both RMS State Roads carrying main road traffic flows. The primary access to the hospital is from Panorama Parade - Marcel Crescent which is part of the local street system under the control of Blacktown Council.

Traffic signal control at the local street interface with the main arterial roads provides for hospital traffic access. At the Panorama Parade hospital access road a single lane roundabout provides control as shown in Figure 2 and Figure 3. The ramped access from Panorama Parade has a load limit of 15 tonnes.

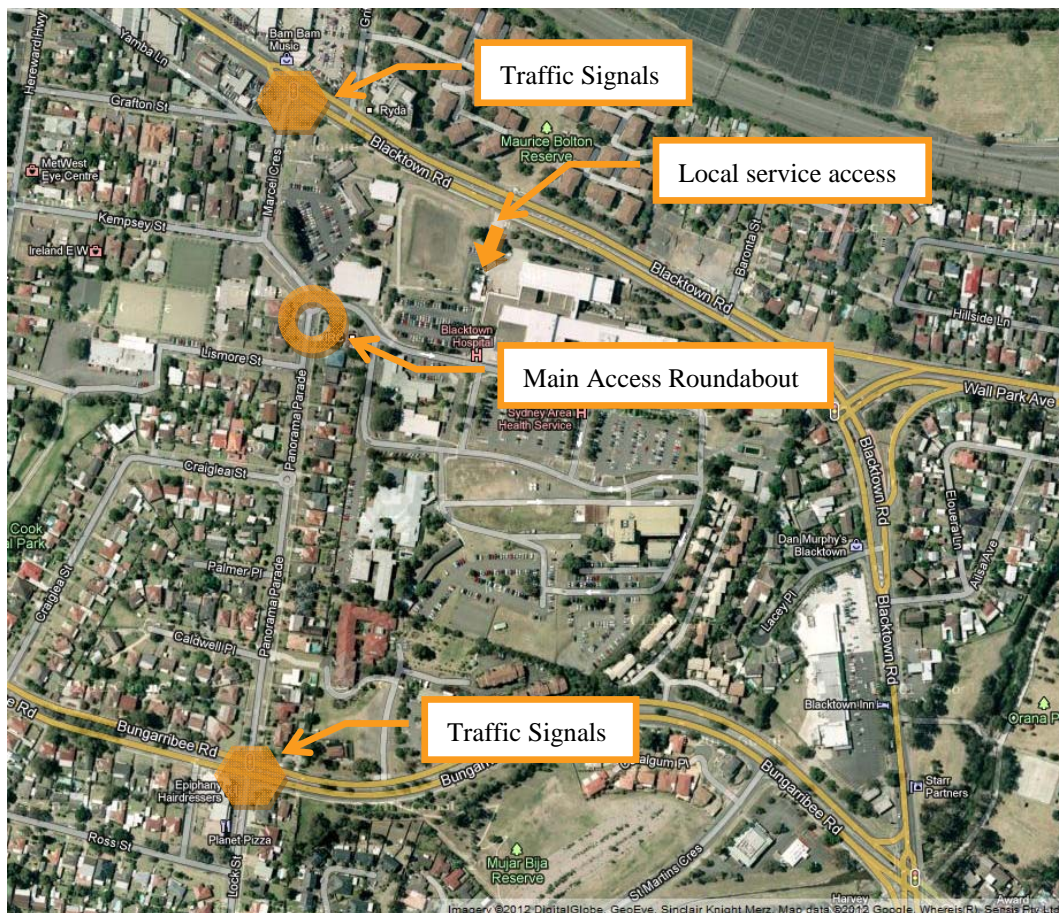


Figure 2 Existing access arrangements and intersection control



Figure 3 Panorama Parade intersections with Blacktown Road and hospital entrance

Blacktown Road is configured with two through traffic lanes in each direction and additional turning lanes at intersections. It is heavily trafficked with significant peak hour traffic flows.

Panorama Parade is a local street configured with a single traffic lane in each direction and parking permitted generally on both sides of the road. A number of traffic calming devices are located along Panorama Parade to control vehicle speeds. This route is used by non-local traffic connecting between Bungarribee Road and Blacktown Road and connects further south on Lock Street which feeds a large residential precinct. Traffic flows are unknown at this time however it could be expected that they are in excess of local street traffic volumes.

### 3.2 Traffic flow data

Traffic surveys were undertaken on Thursday 21 October, 2010 in the AM (6am-9am) and PM (3pm-6pm) peak periods. Light and heavy vehicle classification data was collected. Vehicle turning counts were undertaken at the following intersections:

- Blacktown Road / Marcel Crescent – traffic signals
- Blacktown Road / Wall Park Avenue – traffic signals
- Bungarribee Road / Panorama Parade – traffic signals
- Panorama Parade / Marcel Cres / hospital access – roundabout

The results of the counts at these intersections are presented in turning movement diagrams located in Appendix A.



### 3.3 Public transport availability

The hospital is approximately 1.2km from Blacktown Railway Station which is outside the normal walk distance and hence staff and visitors rely on bus connections. Figure 5 shows the bus network map for the private bus companies that service the Blacktown area.

Busways operates a hospital service Route 721 which operates 8 services on weekdays between 8.51am and 5.33 pm between Blacktown Station and the hospital. A similar number of services operate on weekend days.



Figure 4 Busways 721 map

Hillsbus operate regular services along Blacktown Road which provide access to the hospital including Routes 630, 611, 700, 702, and 812.



Figure 5 Hillsbus bus network map

Blacktown City Council operates a free CBD shuttle bus that services the Blacktown CBD from the railway station to the Hospital. The route map is shown in Figure 6.

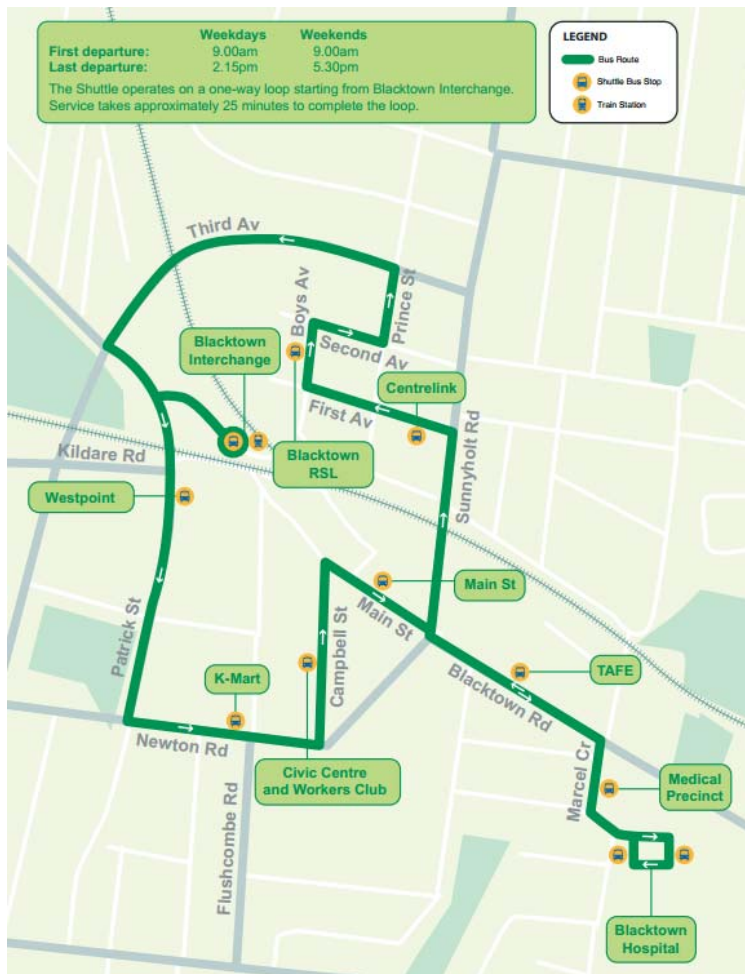


Figure 6 Blacktown CBD Shuttle route map

### 3.4 Pedestrian and cycle facilities and conditions

An existing off-road bicycle facility provides connection between Blacktown Railway Station and Seven Hills Railway Station running along International Peace Park to the north of the railway line. Unfortunately there are no pedestrian or bicycle connections across the railway line between these two stations.

All cycling in the vicinity of the hospital must occur on road shared with traffic.

Footpaths generally occur on both sides of all roads in the vicinity of the hospital although walking connections into the hospital are poor. The intersection of Blacktown Road and Wall Park Road is controlled by traffic signals but there are no pedestrian crossing facilities which mean access from the east to the hospital is poor.

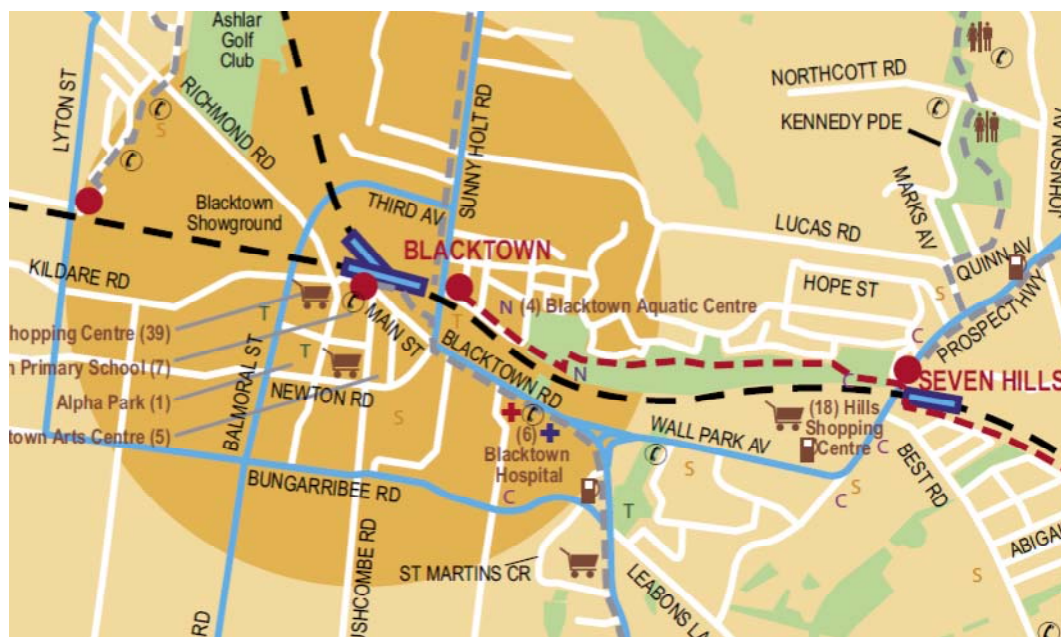


Figure 7 Blacktown City Council Bike Plan





## 4.1 Proposed construction access

The proposed construction access on the future hospital access alignment will operate as a left-in/left-out priority controlled intersection. To accommodate 19m Articulated Vehicles (AV) and to avoid the need to upgrade telecom services in the short term, the temporary construction entrance and exit driveways have been separated. The access is shown in Figure 9 below. Turning path analysis was completed for the temporary construction access. The results are shown in Appendix B. Vehicles from Baronta Street are able to operate in conjunction with construction vehicles exiting and entering the site.

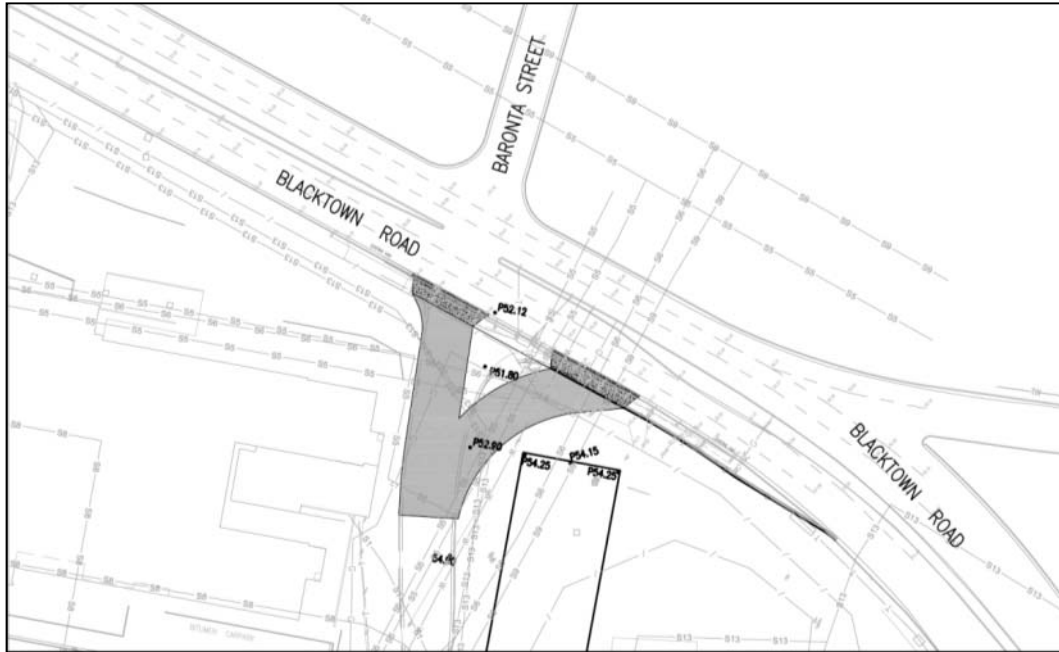


Figure 9 Temporary Construction Access



The left-in left-out arrangement requires vehicles to decelerate from 60km/h to approximately 20km/h to execute the left turn. The Blacktown Road approach is a long left hand curve travelling through the Wall Park Avenue intersection. The required Sight Stopping Distance (SSD) for trucks on 60km/h roads is 74m, see Figure 10. Approximately 80m is available, as shown in Figure 11.

Table 5.5: Truck stopping sight distances			
Operating speed (km/h)	Single unit trucks, Semi-trailers and B-doubles Based on $d = 0.29$ <sup>(1)</sup>		
	$R_T = 1.5$ s <sup>(2)</sup>	$R_T = 2.0$ s	$R_T = 2.5$ s
40	38	44	49
50	55	62	69
60	74	82	91
70	96	105	115
80	120	131	142
90	147	160	172
100	—	191	205
110	—	225	241

Figure 10 Sight Stopping Distance (Austroads)



Figure 11 Available sight distance (Source: Google Maps)

For the left turn out manoeuvre, a 5 second gap is required, which equates to 83m as per Figure 12. Approximately 93m is available, as shown in Figure 13.

Table 3.4: Critical acceptance gaps and follow-up headways

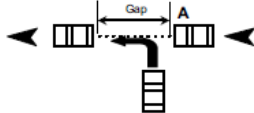
Movement	Diagram	Description	ta	tf
Left-hand turn		Not interfering with A Requiring A to slow	14-40 sec 5 sec	2-3 sec 2-3 sec

Table 3.5: Table of minimum gap sight distances ('D' metres) for various speeds

Critical gap acceptance time (ta) (secs)	85th percentile speed of approaching vehicle (km/h)										
	10	20	30	40	50	60	70	80	90	100	110
4	11	22	33	44	55	67	78	89	100	111	122
5	14	28	42	55	69	83	97	111	125	139	153
6	17	33	50	67	83	100	117	133	150	167	183
7	19	39	58	78	97	117	136	155	175	194	214
8	22	44	67	89	111	133	155	178	200	222	244
9	25	50	75	100	125	150	175	200	225	250	275
10	28	56	83	111	139	167	194	222	250	278	305

Figure 12 Minimum Safe Intersection Distance (MSID) (Austroads)

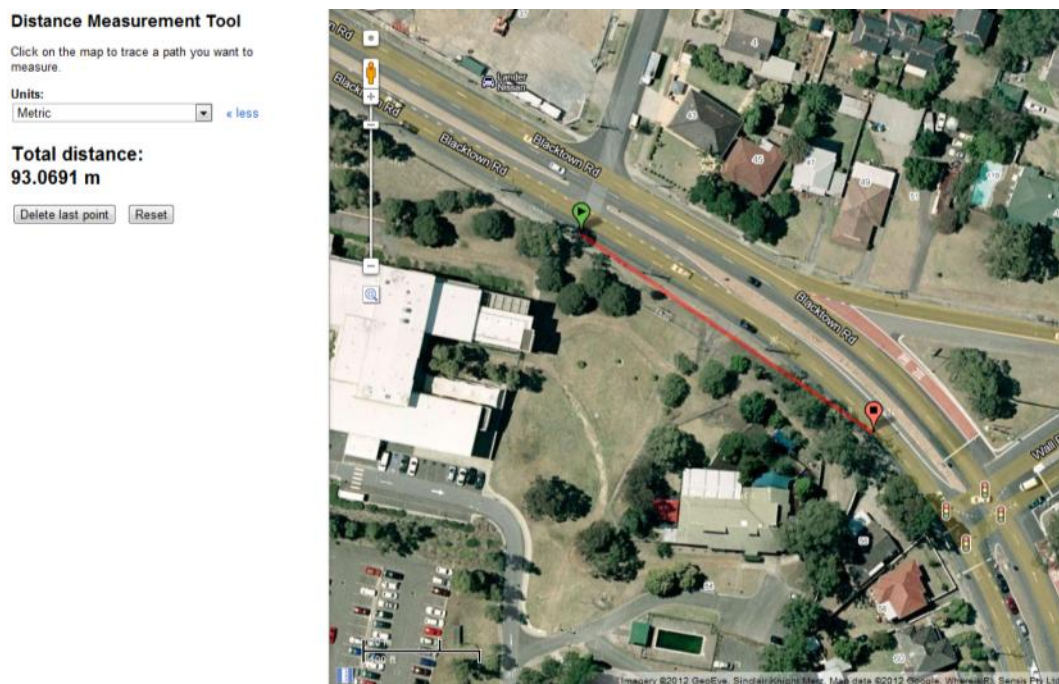


Figure 13 MSID distance from proposed left out (Source: Google Maps)



Figure 14 Sight distance looking east towards the Wall Park Ave intersection



## 4.2 Heavy vehicle routes to site

Trucks turn left into the temporary construction access from Blacktown Road. As seen in Figure 15, the trucks would access the site on Blacktown Road from the M4 and Wall Park Avenue from the M2/M7. Trucks exiting the site would use Newton Road and Reservoir Road to the M4 and Sunnyholt Road for travel north and west to M2/M7.

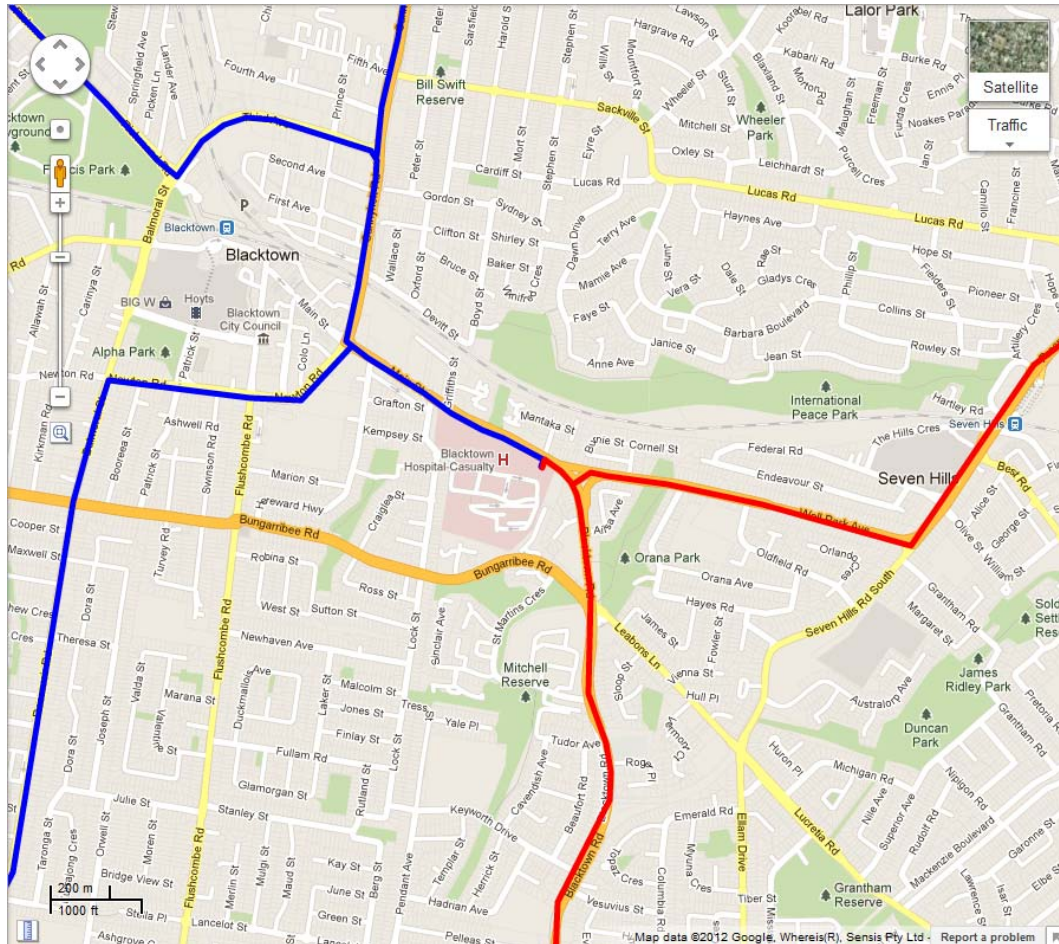


Figure 15 Left in / Left out routes (Source: Google Maps)

### 4.3 Construction traffic volumes

Table 3 Estimated construction traffic volumes

Stage	Approx daily vehicle movements (in + out)	Approx peak hour movements (in + out)
Phase 1	20	2-4
Phase 2	40	4-6
Phase 3	40	4-6
Phase 4	40	4-6
Phase 5	80	8-10
Phase 6	60	6-8
Phase 7	40	4-6

### 4.4 Cumulative impact of existing site and construction traffic

The additional site construction traffic generation (up to an average of approximately 10 trucks in the peak hour) is relatively small when compared to the existing site traffic generation of 336 vehicles in the AM peak and 257 vehicles in the PM peak (peak flows at the main roundabout entrance). Blacktown Road carries high traffic volumes in platoons due to the SCATS coordinated signals and has adequate capacity for the additional truck traffic with negligible impact to the surrounding area.

The proximity of the construction access to the intersection of Blacktown Road and Wall Park Avenue means that that approaching vehicles are likely to arrive at the posted speed and the left-in access has been designed to operate at a higher speed to clear construction vehicles from Blacktown Road. Therefore the impact of construction vehicles turning off Blacktown Road is likely to be reduced.

### 4.5 Parking

Three car parking areas for construction vehicles have been allocated within the campus. These locations are described in the diagram below and in Appendix C. However, it is expected that significant numbers of the construction workforce will travel by train and bus outside the morning and afternoon commuter peak. These car parking areas would be contained within the construction site and are not likely to impact on the surrounding campus.



## 5 Measures to Ameliorate Impacts

### 5.1 Blacktown Road operations during construction

A traffic control plan will be implemented on Blacktown Road and Wall Park Avenue involving advance warning signage and other necessary control measures. Improvements to sight distance between the temporary construction access and Wall Park Avenue will be considered including removal/trimming of low tree branches and possible setting back of the embankment. Figure 16 shows the low tree branches on hospital property that will be considered for trimming.



Figure 16 Trees to be trimmed

### 5.2 Parking

Demand management strategies are proposed to be utilised by the hospital to reduce the overall demand for car parking on the campus during construction works. These strategies include:

- Improved access control to existing car parking areas
- Increased parking fees
- Relocation of several clinics to Mt Druitt campus
- Removing fleet vehicle parking from the site

It is estimated that these demand management strategies will reduce the staff and resident demand for parking at the Blacktown campus by between 100 to 120 spaces at the peak usage times.

On-street car parking will be shared between hospital and construction workers. An agreement between the hospital and Seven Hills RSL has enabled the hospital to utilise 216 car parking spaces in the Blacktown Bowling Club car park for hospital use to provide adequate on-site car parking is available for visitors and patients to the hospital. A small allocation of car parking spaces will be made available for construction workers in this car park.

This off-site car park is proposed to be used to maintain parking while the MSCP works are underway. The MSCP will then be used as the main car park for staff and visitors during construction of the Stage 1 Building.

### 5.3 Pedestrians

As construction vehicles have a separate access to the site, existing pedestrian access to the hospital is not likely to be affected. The pedestrian footpath along Blacktown Road is to be maintained with appropriate signage to warn pedestrians of construction activity. If needed, traffic controllers will be used to control pedestrians during the peak heavy vehicle movements entering the site.

Pedestrian access to the child care centre will be maintained using hoarding/fencing between the construction vehicle car-parking area and the centre. The crossing of the construction vehicle route will be managed by traffic controllers.

### 5.4 Driver Code of Conduct

To manage driver conduct the following measures are to be implemented:

- All deliveries are to be pre booked
- All deliveries are to check in at the site office
- Vehicles are to enter and exit the site in a forward direction along the travel path shown on delivery maps
- Drivers are to give way to pedestrians and plant at all times.

### 5.5 Traffic Control Plans

Traffic control plans will be prepared by the contractor prior to work commencing. The TCP will provide a detailed plan of the required signage and traffic and safety management measures to be implemented on-site.

## 6 Public Transport Services

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No bus services operating on Blacktown Road would be impacted by construction traffic as the work is confined to off street works within the hospital.

For each phase of the construction works, an internal loop route for the 721 hospital bus service and the Free Blacktown Shuttle bus will be maintained within the campus. During Phase 3 which runs for 10 weeks, it may be necessary to utilise an alternative arrangement by stopping the bus external to the campus or utilising the construction access for this short period. By the end of Phase 6, the bus would be able to complete the loop through the hospital access road and exit onto Blacktown Road.

## 7 Provisions for Emergency Vehicles

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Construction works and vehicle storage will be confined to the site. As such, no additional specific provisions for emergency vehicles have been identified on the surrounding road network.

## 8 Public Consultation

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During construction works, residents in the vicinity of the site will be notified about the intended works:

- Prior to the commencement of works
- Where there is potential for works to cause nuisance

Residents will be notified by a letter specifying:

- The nature and extent of the works
- Contact details for the Site Safety Officer to whom complaints about the upgrade should be directed

Details of construction traffic routes and any potential traffic-related impacts will be included in this correspondence.

## 9 Conclusions

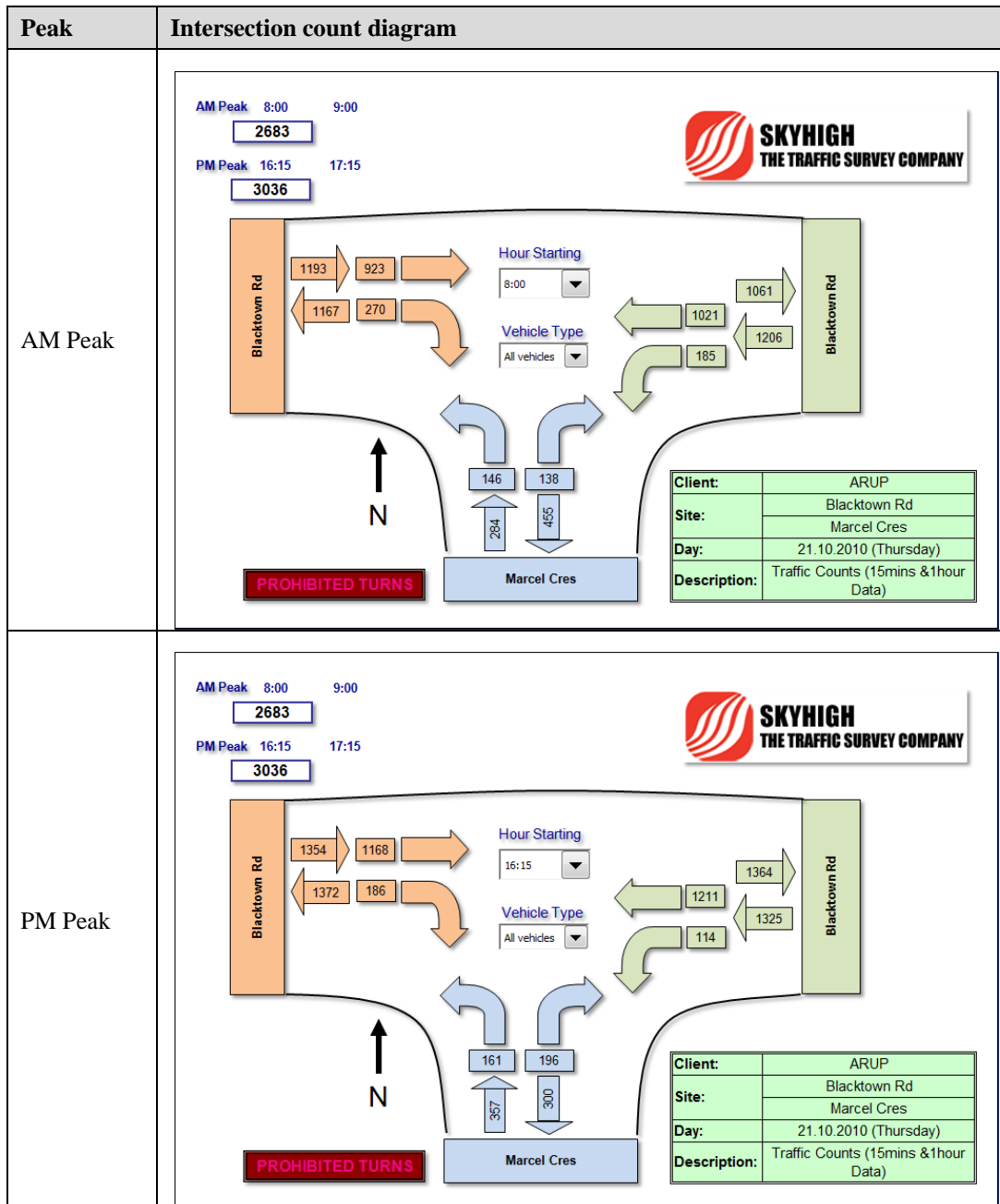
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Through the implementation of traffic management measures, the anticipated level of construction traffic can be accommodated on the access road system. The proposed temporary left-in left-out construction access on Blacktown Road will enable separation of hospital traffic from construction traffic which minimises the impact of construction works on the operation of the hospital.

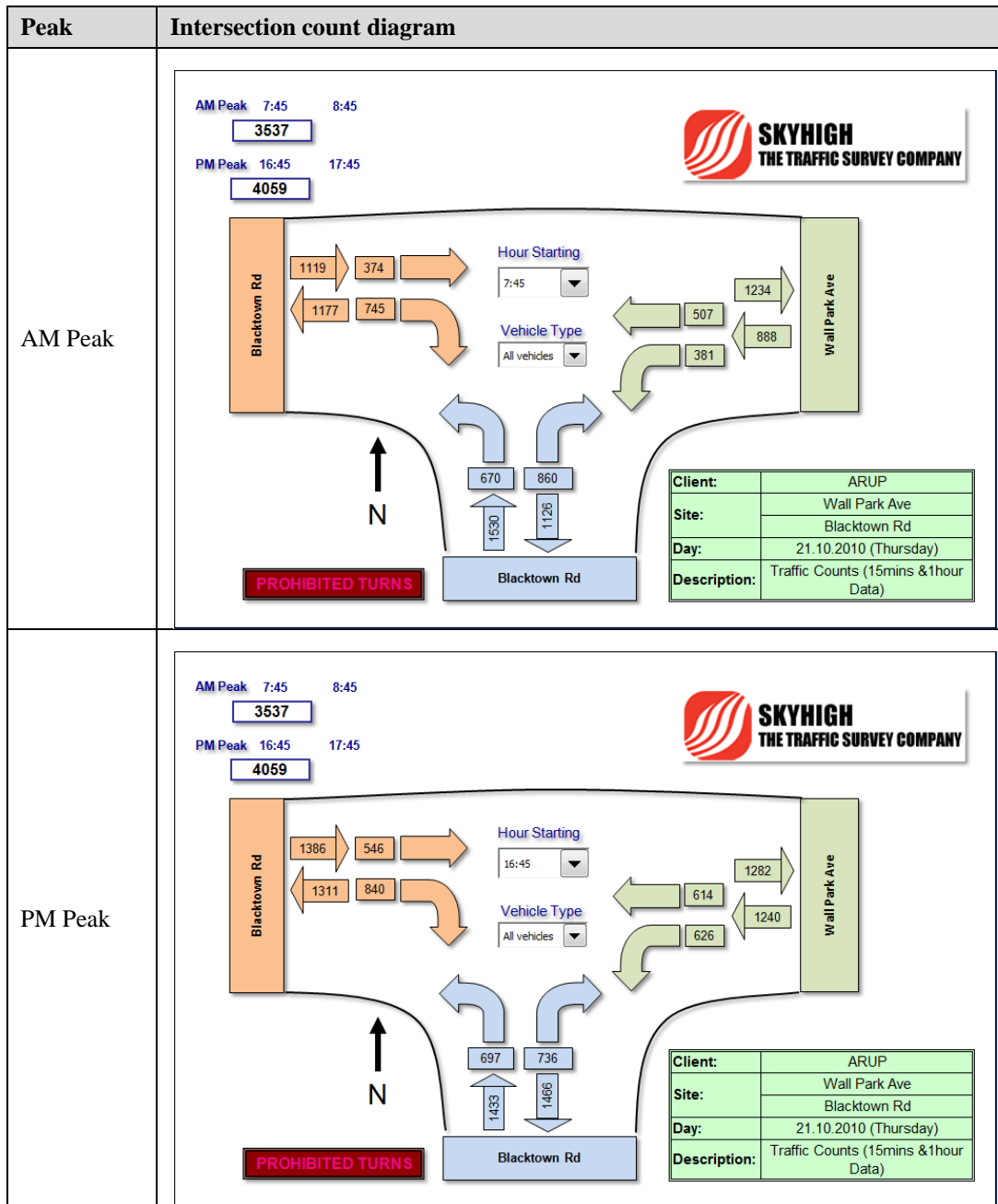
## Appendix A

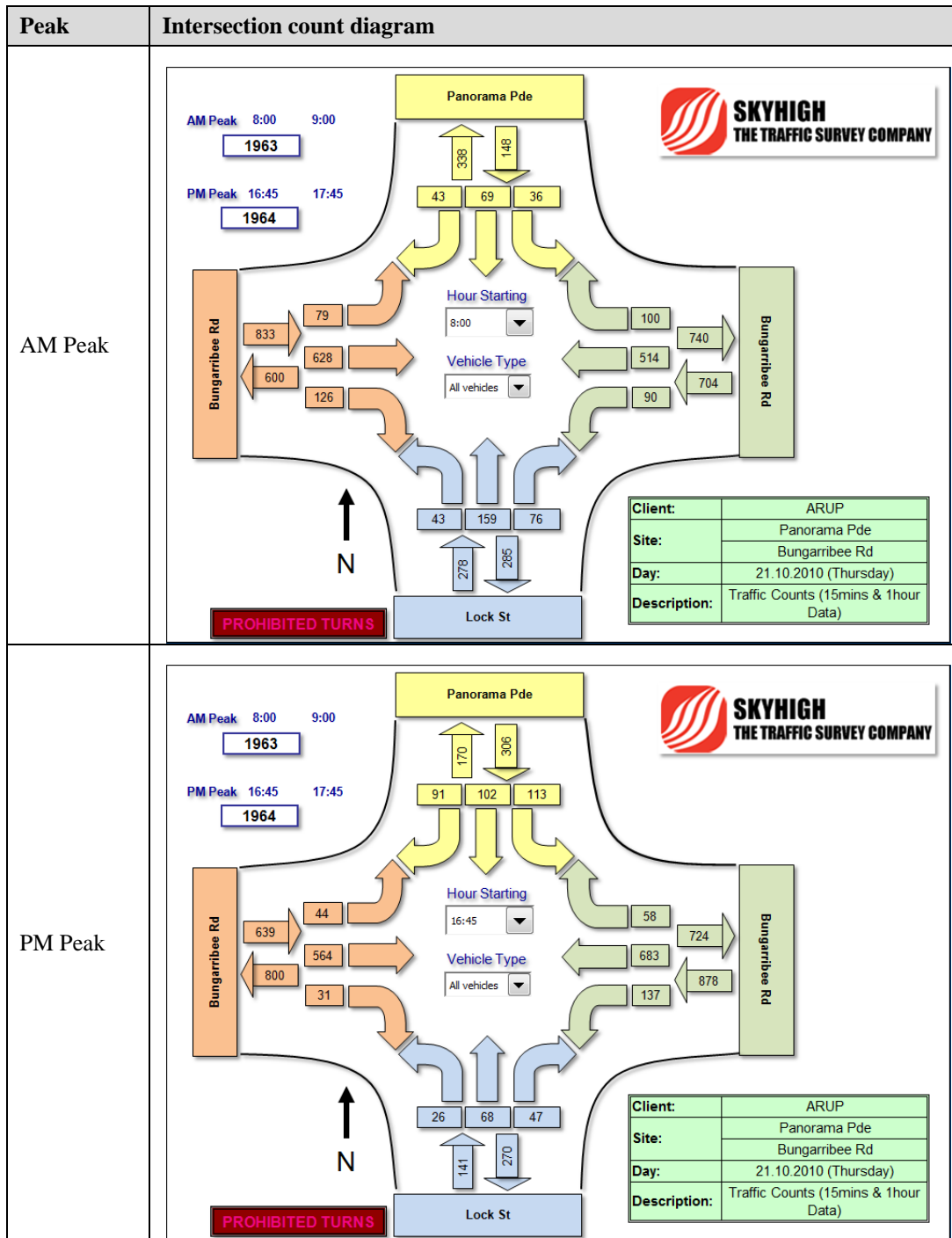
### Traffic Volumes

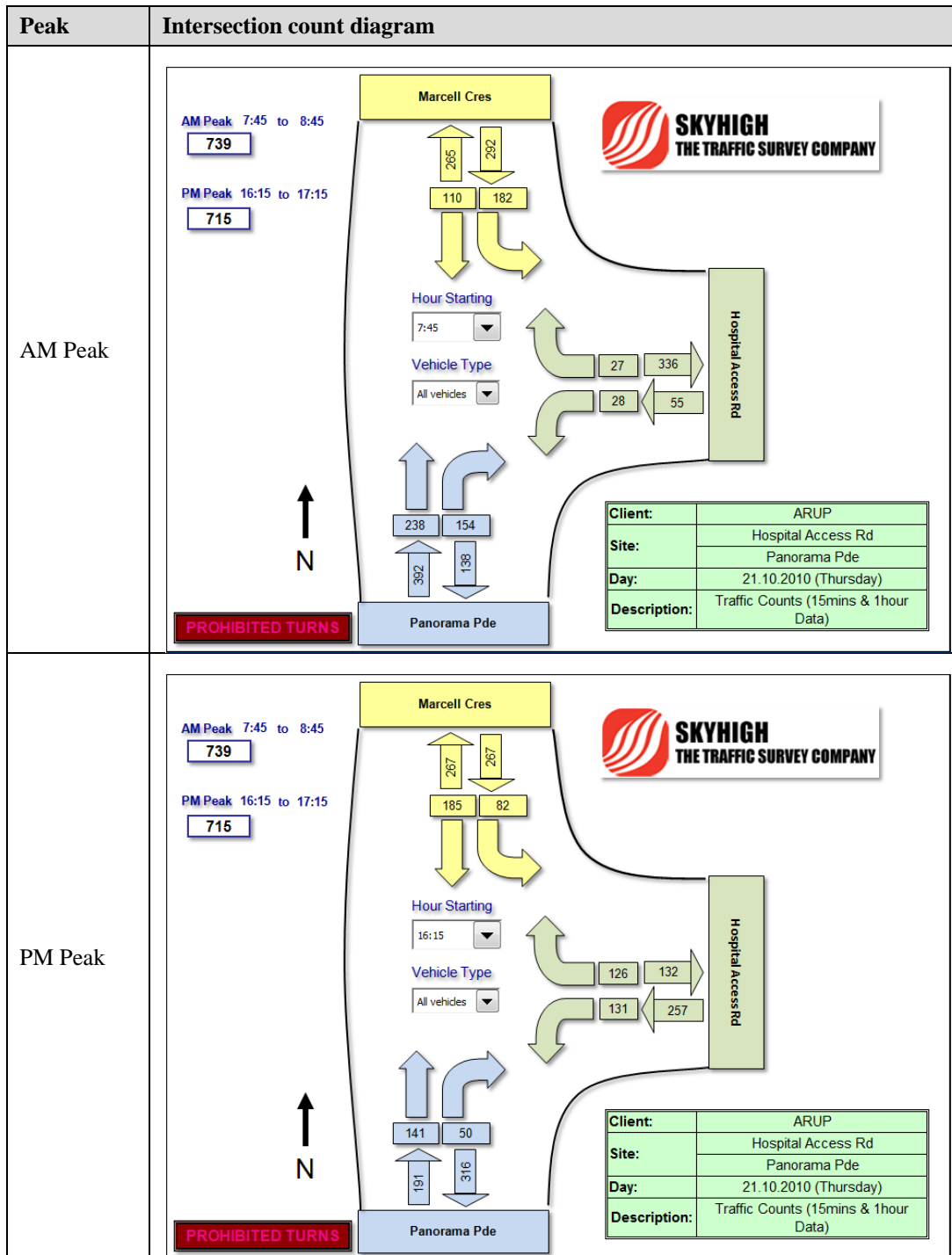
## A1 Traffic Volume Diagrams





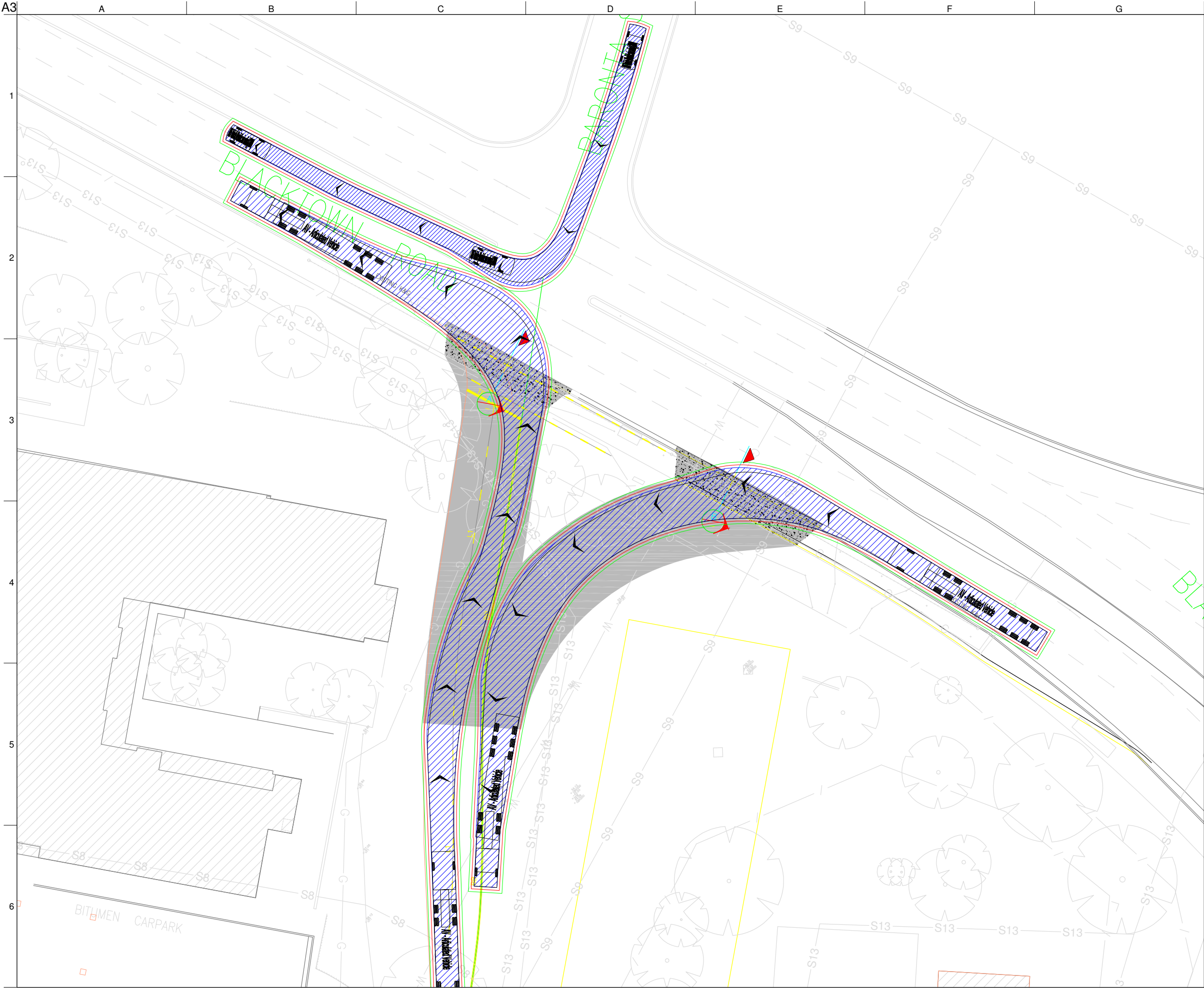






## **Appendix B**

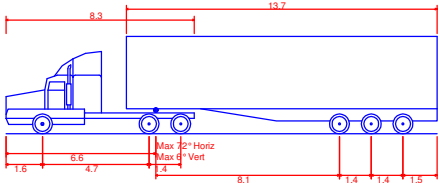
### **Turning Path Analysis**



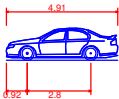
Legend

- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



AV - Articulated Vehicle  
Overall Length 19.000m  
Overall Width 2.500m  
Overall Body Height 4.301m  
Min Body Ground Clearance 0.418m  
Track Width 2.500m  
Lock to Lock Time 6.00 sec  
Curb to Curb Turning Radius 12.500m



B85 Vehicle (Realistic min radius) (2004)  
Overall Length 4.910m  
Overall Width 1.870m  
Overall Body Height 1.421m  
Min Body Ground Clearance 0.120m  
Track Width 1.770m  
Lock to Lock Time 4.00 sec  
Curb to Curb Turning Radius 5.750m

A	16/04/12	JRT	MAC	AMH
For Information				
Issue	Date	By	Chkd	Appd

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Client

Health Infrastructure

Job Title

Blacktown and Mount Druitt Hospital

Drawing Title

Turning Paths  
North Temporary Entrance/Exit  
19m Articulated Vehicle

Scale at A3  
1:400

Discipline

Drawing Status

Sketch

Job No 221031	Drawing No SKT002	Issue A
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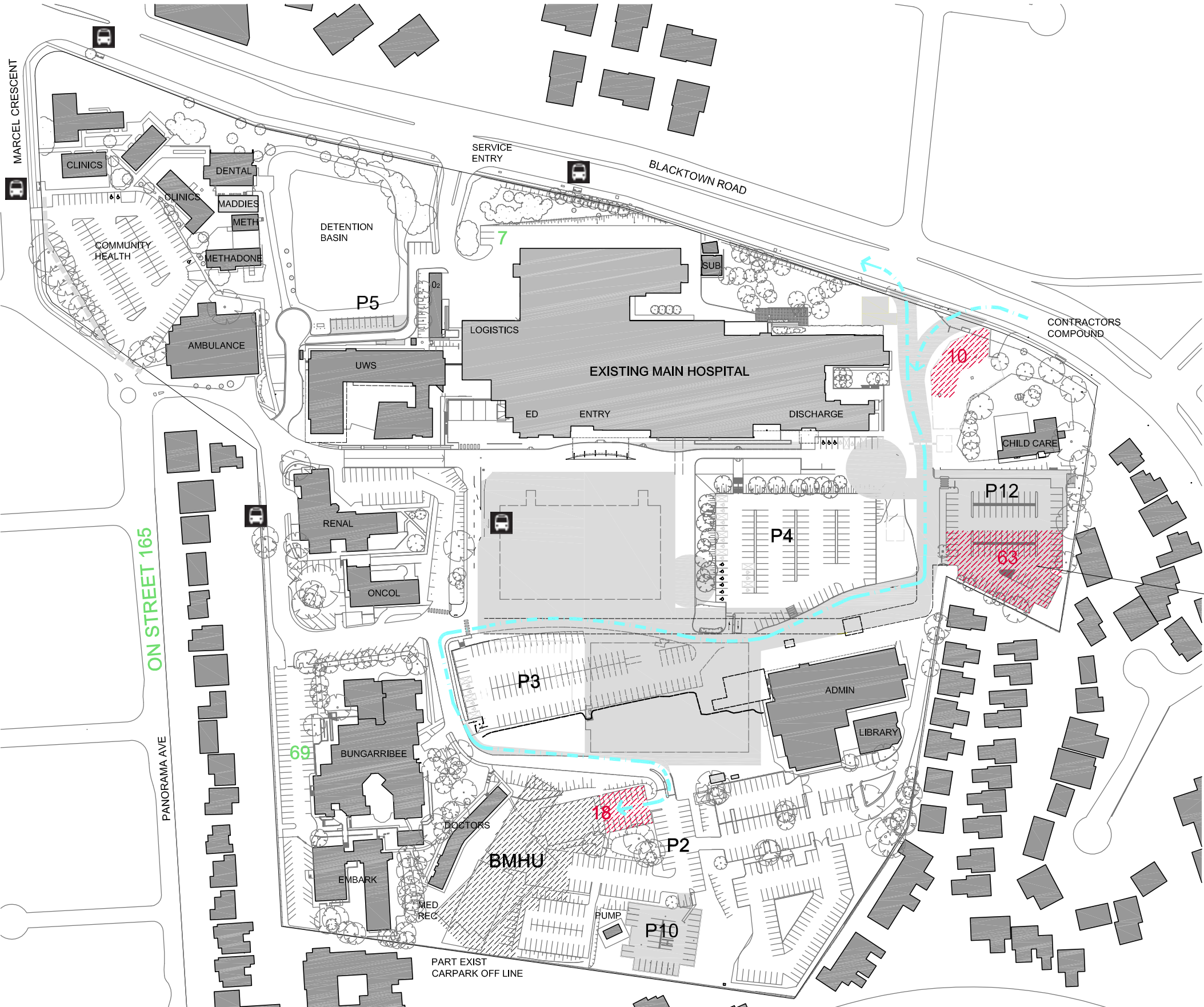


## **Appendix C**

### **Construction Vehicle Parking**

CONTRACTORS PARKING

CAR PARKING ASSESSMENT



20 OFF SITE CONTRACTORS PARKING SPACES

NOTE: P12 HATCHING SHOWS NOMINATED CONTRACTORS PARKING ZONE ONLY. EXACT DEMARCATION & TRAFFIC CIRCULATION TO LATER DETAILS

CONTRACTOR CARPARK NUMBERS	
<b>NEW PARKS</b> + BMHU: 18 + CONTRACTORS COMPOUND: 10 + P12: 63 + OFF SITE: 20	111

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