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A TRAFFIC AND PARKING

IMPACT ASSESSMENT

FOR

PENRITH HEALTH CAMPUS
STAGE 3A MENTAL HEALTH

Prepared for

Savills Australia

By

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TEF Consulting

Report Document Control

Title	A TRAFFIC AND PARKING IMPACT ASSESSMENT FOR PENRITH HEALTH CAMPUS STAGE 3A MENTAL HEALTH
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Contents Table

1 INTRODUCTION

Report title	A traffic and parking impact assessment for the Penrith Health Campus Stage 3A Mental Health (PHCMH).
Report purpose	• assessment of traffic and parking impacts of the proposal • advice on access options
Client	Savills Australia
Background information used for preparation of the present report	• plans of the proposed development prepared by Woods Bagot • requirements for the traffic and parking impact assessment report provided by the Director General • results of site inspections carried out by TEF Consulting at Penrith Health Campus • results of traffic, parking, staff and visitor surveys carried out by TEF Consulting near Penrith Health Campus in 2008 as an input for Stage 3 Project Definition and Clinical Service Plans as well as for PHC Stage 3 East Block. These results were reviewed and updated where necessary. • results of various surveys carried out by TEF Consulting at other hospitals previously • other documentation - refer to **Section 6** References of the present report.
Consultation	• Woods Bagot • Savills Australia Assistance of these organisations is greatly appreciated.

2 EXISTING TRAFFIC AND PARKING SITUATION

Basis for analysis

- Information contained in a report prepared by TEF Consulting for PHC Stage 3 East Block (PHCEB) on 27 August 2009. The PHCEB report contained detailed information about traffic and parking patterns including
  - Analysis of information about activities of various PHC facilities obtained from the PHC administration
  - Results of the site inspection
  - Intersection traffic volume counts
  - Counts of vehicles entering and leaving the site
  - Car parking accumulation and turnover surveys
  - Analysis of staff rosters
  - Questionnaire surveys of staff
  - Patient and visitor accumulation surveys
  - Questionnaire surveys of outpatients and visitors

  Applicable data from the items listed above is presented in relevant Sections of the current report. Refer to the PHCEB report for further details.
- Information presented in the following reports prepared by others after the PHCEB report
  - Colston Budd Hunt and Kafes (January 2010) Traffic report for Nepean Hospital redevelopment: Mental Health Services, Oral Health Unit and car parking (referred to as CBH&K report further in this document)
  - SCAPE (May 2010) Penrith Health Campus - Transport and Parking Needs Review - Update (Stages 3 and 3A) (referred to as SCAPE (2010) Needs report further in this document)
  - SCAPE (July 2010) Nepean Hospital Wayfinding and Signage Strategy (referred to as SCAPE (2010) Wayfinding report further in this document)

Site

Penrith Health Campus, Derby Street, Kingswood.

Site area – approximately 120,000 m^2

Refer to **Figure 1** for the site location.

Facilities

PHC is a 420-bed major Referral Hospital. Services include

- maternity
- gynaecology
- neonatal intensive care
- emergency
- diagnostics
- paediatric
- surgical
- intensive care
- coronary care
- rehabilitation
- mental health
- Tresillian Family Care Centre
- Menopause Service
- Nepean Cancer Care Centre
- Diabetes Service
- the Wentworth Centre for Drug and Alcohol Medicine.
- The East Block is currently being constructed. It will contain 54 short- and long-stay beds and 6 operating suites

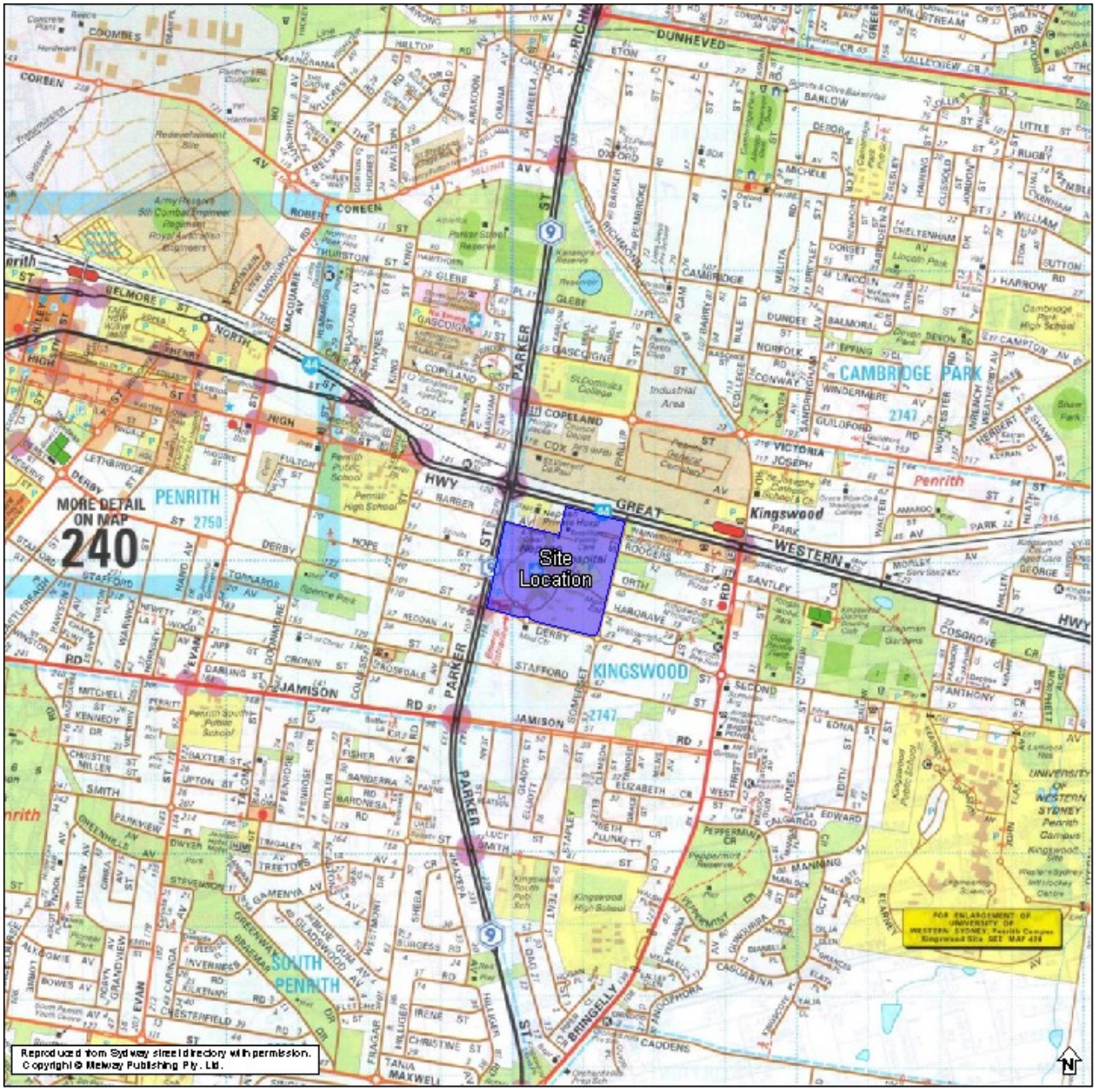


Figure 1. Site location.

2.1 Car parking provision and demand

2.1.1 Surveys of existing car parking situation

Off-street parking provision

- 1,277 marked and de-facto car parking spaces before the East Block construction period. Eighty one (81) additional spaces will be constructed as part of the East Block project, bringing the total car parking provision to **1,358 car parking spaces**. The latter number has been adopted as the base case for the purposes of

the present report.

- some informal areas habitually used for parking
- refer to **Figures 2** and **3** for parking locations before and after the East Block de development
- refer to **Table 2.1** for details of individual car parking areas

Table 2.1. Off-street car parking areas before East Block construction.

Number	Name	Spaces	Allocation
	Pay Car Parks		
1	Barber Avenue	42	staff permit
4	Westblock/ lower	165	staff permit
4	Westblock/ upper	94	visitor/ casual staff
5	Emergency	83	ED visitors/ on call clinical staff
6	Area Office	23	staff permit
8	Derby Street	151	staff permit
9	Clinical Sciences	47	staff permit
9a	Clinical Sciences	13	staff
10	Main Entrance	115	visitor/ casual staff
13	Somerset Street	322	visitor/ staff
13	Somerset Street/ Staff	27	staff (Doctors/ visiting medical officer)
	Subtotal	***1082***	
	Not controlled		
1b	Barber Avenue	6	Pialla staff
2	Pialla	10	
2a	Blood bank/ contractors	12	Blood donors / service contractors
3	Transport	6	Fleet cars
4a	Westblock	4	drop off
5a	Derby Street	9	staff
5b	Emergency	10	Emergency/ police/security/VMO
7	Pool vehicles	24	Pool vehicles/ staff
10a	Short-term and disabled	10	
11	Staff Education	6	Reserved staff
12	Sommerset Street Entrance	4	Disabled
12a	North Block	3	drop off
14	Child Care	13	Child care staff and pick up/ drop off zone
15	Cancer Care	35	Patient parking only
16	Tresillian	43	Tresillian staff and visitor/ clients only
	Subtotal	***195***	
	Total	**1277**	

Note: refer to **Figure 2** for car parking area number

Figure 2. Off-street car parking areas before East Block construction.

On-street car parking availability

- A total of approximately 720 marked and unmarked car parking spaces within a convenient walking distance.
- Time restrictions apply only to a short section of the southern side of Derby Street on the approach to the intersection with Parker Street. All other on-street parking is unrestricted.
- On-street parking spaces in the streets to the east and to the south of PHC are mostly marked, enabling better efficiency and a lesser impact on residents.
- Refer to **Figure 4** for parking locations.

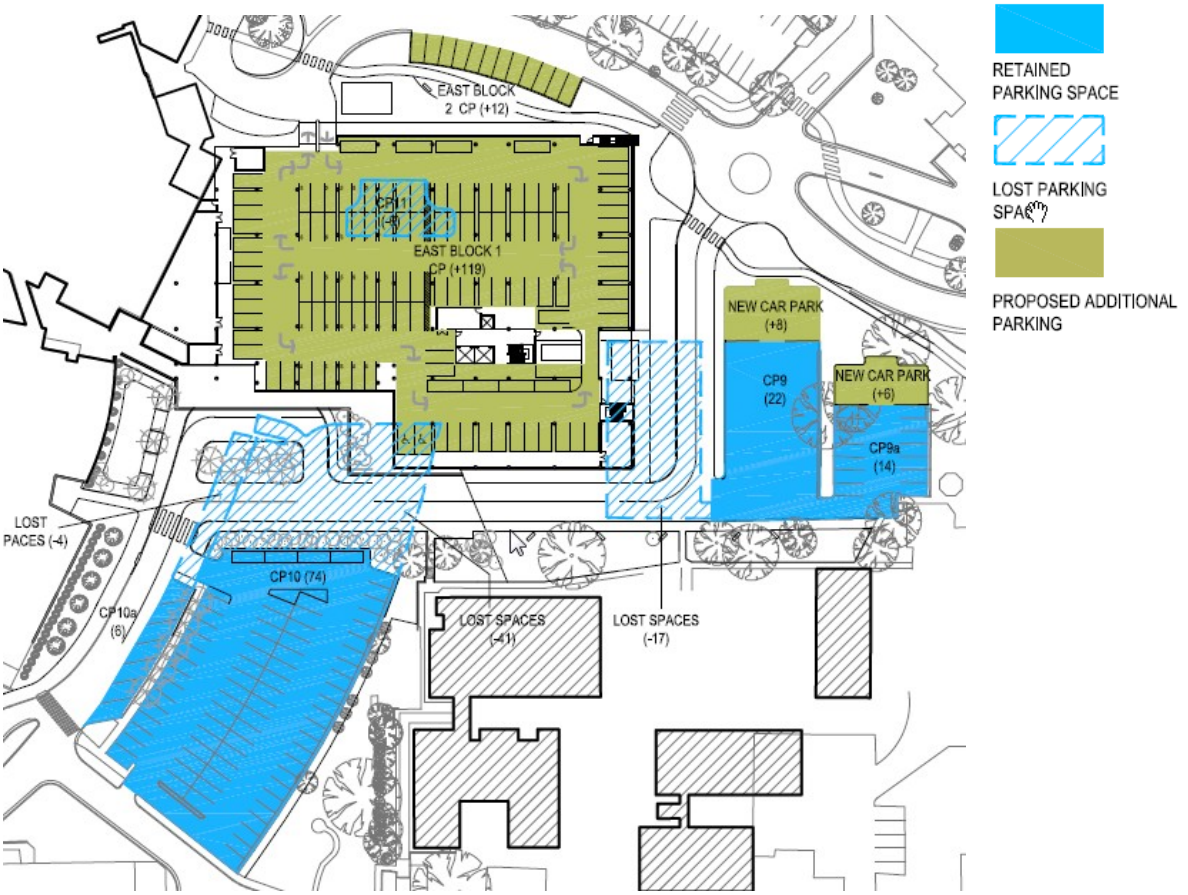


Figure 3. Car parking provision changes due to the East Block development.

Figure 4. On-street parking areas and the number of parking spaces.

Parking accumulation surveys – off-street

Location(s)	Refer to **Figure 2**
Date	Tuesday 29 April 2009
Time period	08:00 – 18:00
Exclusions	Area 16 was not included in the surveys because access to this area is restricted and this area is only for Tresillian unit staff and clients.
Important conclusions	Survey results are consistent with those obtained by TEF Consulting and other consultants in the previous years
	Peak parking demand occurred at approximately 14:00 with 1,100 vehicles present
	The current practical capacity is approximately 1,100 car parking spaces, equalling some 12% underutilisation of the total car parking provision

Survey results are contained in **Table 2.2.**

Table 2.2. Existing off-street car parking demand (prior to the East Block development).

	CAR PARKING AREAS																										
Time	1	1b	2	2a	4 upper	4 lower	4c	4c amb	5	5a	5a amb	5b	6	7	8	9	9a	10	10a	11	12	12a	13	13 VMO	14	15	TOTAL
8:00	16	0	3	4	47	124	4		41	6		7	11	14	86	26	7	58	7	4	4	4	159	11	2	9	654
8:30	21	9	3	5	84	131	3		49	6		8	15	17	108	41	10	79	8	4	4	4	183	15	2	16	825
9:00	23	3	3	8	95	130	4		65	8		7	15	22	117	39	10	97	9	6	4	4	247	20	3	23	962
9:30	25	2	4	9	95	129	5		83	8		9	18	20	120	39	10	114	9	6	4	5	265	22	0	25	1026
10:00	28	2	4	11	95	132	5		83	7		8	17	20	122	42	10	113	10	4	4	5	284	23	0	29	1058
10:30	29	2	5	10	95	133	6		83	7		8	18	21	119	42	11	115	10	6	4	5	300	24	0	28	1081
11:00	31	4	9	10	95	131	5		83	6		9	18	19	118	42	11	113	10	8	4	6	298	26	0	31	1087
11:30	29	5	11	9	95	137	4		83	7		8	18	20	118	37	11	113	10	5	4	6	294	26	0	25	1075
12:00	31	5	7	9	95	141	3	2	83	7		9	18	19	121	40	11	114	10	4	4	5	293	26	0	21	1078
12:30	32	4	6	10	92	140	3	3	79	6		6	17	19	121	34	11	111	10	4	4	5	286	25	0	20	1048
13:00	33	5	4	8	93	142	5		83	7		6	19	23	123	39	11	115	9	5	3	6	287	22	0	20	1068
13:30	35	6	5	9	95	156	6	1	83	7		9	19	21	127	39	12	110	9	5	4	4	297	20	0	21	1100
14:00	36	6	6	9	95	164	7		83	7		7	19	22	127	42	12	115	9	6	4	7	306	18	1	27	1135
14:30	36	6	4	7	91	157	4	2	78	7		5	19	21	126	41	12	110	10	6	4	6	311	18	1	35	1117
15:00	34	6	7	7	77	152	8		78	7		7	20	21	126	40	12	107	6	4	4	7	296	20	0	28	1074
15:30	35	6	8	7	81	147	4		75	7		6	17	21	125	39	13	99	8	5	3	8	270	17	1	30	1032
16:00	28	5	11	9	68	106	3	2	76	4	3	6	16	18	114	36	13	93	10	5	4	7	246	15	1	22	921
16:30	26	5	10	6	52	88	3		66	3	3	8	13	11	98	32	11	82	7	5	4	7	212	15	4	19	790
17:00	17	5	5	7	34	68	2		68	3	3	7	13	9	78	23	7	75	6	6	3	5	166	11	3	16	640
17:30	19	5	6	5	27	59	2		64	4	3	9	11	4	59	13	4	61	6	5	3	5	135	9	3	10	531
18:00	17	6	7	5	24	54	1		60	3	3	8	9	2	55	9	0	61	9	4	4	6	113	5	4	5	474
	No. of spaces																										
	42	6	10	12	94	165	4		83	9	AMB	10	23	24	151	47	13	115	10	6	4	3	322	27	13	35	1234
Time	VACANT PARKING SPACES																										
8:00	26	6	7	8	47	41	0		42	3		3	12	10	65	21	6	57	3	2	0	-1	163	16	11	26	574
8:30	21	-3	7	7	10	34	1		34	3		2	8	7	43	6	3	36	2	2	0	-1	139	12	11	19	403
9:00	19	3	7	4	-1	35	0		18	1		3	8	2	34	8	3	18	1	0	0	-1	75	7	10	12	266
9:30	17	4	6	3	-1	36	-1		0	1		1	5	4	31	8	3	1	1	0	0	-2	57	5	13	10	202
10:00	14	4	6	1	-1	33	-1		0	2		2	6	4	29	5	3	2	0	2	0	-2	38	4	13	6	170
10:30	13	4	5	2	-1	32	-2		0	2		2	5	3	32	5	2	0	0	0	0	-2	22	3	13	7	147
11:00	11	2	1	2	-1	34	-1		0	3		1	5	5	33	5	2	2	0	-2	0	-3	24	1	13	4	141
11:30	13	1	-1	3	-1	28	0		0	2		2	5	4	33	10	2	2	0	1	0	-3	28	1	13	10	153
12:00	11	1	3	3	-1	24	1	-	0	2		1	5	5	30	7	2	1	0	2	0	-2	29	1	13	14	152
12:30	10	2	4	2	2	25	1	-	4	3		4	6	5	30	13	2	4	0	2	0	-2	36	2	13	15	183
13:00	9	1	6	4	1	23	-1		0	2		4	4	1	28	8	2	0	1	1	1	-3	35	5	13	15	160
13:30	7	0	5	3	-1	9	-2	-	0	2		1	4	3	24	8	1	5	1	1	0	-1	25	7	13	14	129
14:00	6	0	4	3	-1	1	-3		0	2		3	4	2	24	5	1	0	1	0	0	-4	16	9	12	8	93
14:30	6	0	6	5	3	8	0	-	5	2		5	4	3	25	6	1	5	0	0	0	-3	11	9	12	0	113
15:00	8	0	3	5	17	13	-4		5	2		3	3	3	25	7	1	8	4	2	0	-4	26	7	13	7	154
15:30	7	0	2	5	13	18	0		8	2		4	6	3	26	8	0	16	2	1	1	-5	52	10	12	5	196
16:00	14	1	-1	3	26	59	1	-	7	5	-	4	7	6	37	11	0	22	0	1	0	-4	76	12	12	13	312
16:30	16	1	0	6	42	77	1		17	6	-	2	10	13	53	15	2	33	3	1	0	-4	110	12	9	16	441
17:00	25	1	5	5	60	97	2		15	6	-	3	10	15	73	24	6	40	4	0	1	-2	156	16	10	19	591
17:30	23	1	4	7	67	106	2		19	5	-	1	12	20	92	34	9	54	4	1	1	-2	187	18	10	25	700
18:00	25	0	3	7	70	111	3		23	6	-	2	14	22	96	38	13	54	1	2	0	-3	209	22	9	30	757

Notes: Tresillian Unit and is not included because its operation does not impact on the main campus parking demand/supply
Negative values indicate parking above the formal area capacity

Parking accumulation and turnover surveys – on street

Location(s)	Refer to **Figure 4**
Date	Tuesday 29 April 2009
Time period	06:00 – 18:00
Exclusions	Parking areas along Parker Street and Great Western Highway which are known to be fully utilised by PHC staff from early morning.
Survey type	Number plate survey to enable identification of vehicle arrivals and departures
Important conclusions	Vehicles likely belonging to the local residents comprised a rather low number, some 50 vehicles in the early morning hours. The majority of these vehicles left the study area by 9:00 am. Peak parking demand occurred between approximately 09:00 and 15:00 with 500 to 550 PHC related vehicles present. Before 07:00 and after 15:00 on-street parking demand is low. There was a certain pattern of vehicle arrivals which could be associated firstly with the morning nursing shift (6:30-7:30 am) and then with the typical 9:00-5:00 (or 8:00-4:00) business hours. The peak of parking demand on-street was closely related to the peak of on-site parking accumulation.

Survey results are contained in **Table 2.3.**

Table 2.3 On-street parking demand (excluding Great Western Highway and Parker Street)

Time	6:00	6:30	7:00	7:30	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
Day parking	90	167	236	299	376	459	488	490	500	499	498	448	334	205	125
Residential vehicles	53	49	45	27	18	6	2	1	0	0	0	0	0	0	0
Unidentified	2	7	6	10	18	20	18	28	20	14	20	33	36	16	36
Total	**145**	**223**	**287**	**336**	**412**	**485**	**508**	**519**	**520**	**513**	**518**	**481**	**370**	**221**	**161**
Total number of spaces	**720**														
Available spaces	**575**	**497**	**433**	**384**	**308**	**235**	**212**	**201**	**200**	**207**	**202**	**239**	**350**	**499**	**559**

2.1.2 Surveys of PHC staff, visitors and outpatients

Staff accumulation patterns

Basis for analysis	Staff rosters and information regarding staff attendances received from the managers of PHC facilities and from SWAHS.
Analysis outcome	A spreadsheet model based on staff attendance information, accounting for staff accumulation overlaps due to various shift times. The model includes staff accumulation by each facility and each staff category by half-hour throughout the day.
Important conclusions	The two largest categories of employees are nursing and administration.

Nurses and the majority of the other staff work in three main shifts:

- morning shifts (starting generally between 7:00 am and 8:30 am and finishing between 3:30 pm and 4:30 pm);
- afternoon shifts (starting generally between 1:00 pm and 2:00 pm and finishing between 10:00 pm and 11:00 pm);
- night shifts (starting generally at 10:30 pm and finishing at 7:00 am).

The largest proportion of nurses is engaged in the morning shifts. On average, approximately 1,600 employees are present on site during the morning (busiest) shift.

The majority of other categories of employees typically start work between 7:00 and 9:00 am and finish between 3:00 and 5:00 pm.

Approximately 10% of the staff is not normally in attendance due to being sick or on leave / RDO[1].

Staff questionnaire survey

Survey design	• A questionnaire survey form distributed to all employees • The respondents were asked questions regarding their status, arrival and departure time, mode of travel, suburb where their trip originated and the approach route and location of parking for car drivers. • The respondents were also invited to suggest measures to improve car parking provision on the Hospital site.

1 RDO – Roster day off

		• A sample questionnaire form is included in **Appendix A**. • Number of completed questionnaires - 889. • Sample size - 56% of the total number of morning/day shift employees. It is considered to be a sample of sufficient size to be able to draw conclusions regarding all staff.
	Analysis outcome	• Car usage rates for each staff category (refer to PHCEB report for detailed results). • Car usage rate of nurses (the largest staff category) of 0.93 cars per person (93% drivers) was adopted for design purposes in PHCEB report and in the present report. • It is noted that SCAPE (2010) Needs report questioned the above car usage rate as possibly overestimated due to a likely bias in responses (non-drivers not participating) and application of this rate for staff categories which had lower car usage rates. • It is also noted that SCAPE (2010) Needs report identified from the Journey to Work (JTW) data provided by the Ministry of Transport that JTW trips with a destination in Travel Zone (TZ) 1856 (largely comprising PHC) indicated a driver mode share as 82% of the total trips. • It is concluded that the car usage rate of 0.93 cars per person is likely to represent the worst case scenario for the present conditions. • It is also concluded, given the lower car usage rate of 0.82 cars per person for JTW trips in TZ containing PHC, that there is a room for improvement towards a lesser car use by the PHC staff.
Headcount of visitors and outpatients in all facilities	***Locations***	All wards and facilities with open access
	Date	Tuesday 29 April 2009
	Time period	09:30 – 17:00
	Inaccessible areas	The number of outpatients in inaccessible areas (e.g. medical suites) was estimated either based on the number of used rooms or on the information obtained from managers of such facilities.

	Important conclusions	Survey results are consistent with those obtained by TEF Consulting and other consultants in the previous years. Peak person accumulation of approximately 250 patients and visitors occurred between 10:30 am and 11:30 am. The number of visitors and outpatients drops substantially (below 200 persons) after 13:00 and continues to decline for the rest of the day. Average visitation rate to inpatients was calculated as 0.45 visitors per occupied bed.
Questionnaire survey of visitors and outpatients	***Survey design***	• A questionnaire survey was carried out in all wards and facilities with open access. • Visitors and outpatients were approached by interviewers and asked questions regarding their mode of travel, arrival and departure time, and period of time stayed at the hospital. • A sample questionnaire form is included in **Appendix A**. • Number of completed questionnaires – 281 representing 511 people (one form was used for groups of people who arrived together). • Sample size – difficult to determine due to unknown visitor/outpatient turnover. It is noted, however, that the sample size is double the maximum number of people on site at any one time. This is considered to be a sample of sufficient size to be able to draw conclusions regarding all visitors and outpatients.
	Analysis outcome	• Car usage rates for each category of visitors and outpatients . • Car usage rate adopted for design purposes ▪ 0.76 cars per person (76% drivers) for outpatients ▪ 0.45 cars per person (45% drivers) for visitors to inpatients • Peak periods of parking demand for visitors, outpatients and staff do not coincide.

2.1.3 Estimated typical parking demand before the East Block construction

Basis for estimation	• Information described in **Section 2.1.2** of the present report, namely ▪ Staff accumulation patterns ▪ Visitor accumulation patterns, adjusted (increased) for design bed occupancy ▪ Outpatient accumulation patterns, factored up to represent a typical busy day, based on information received from facility managers; also factored up to account for visitors in transition between PHC facilities ▪ Car usage ratios of staff, visitors and outpatients for calculation of car parking demand, as follows ***No. of cars = (Number of people) X (car usage rate)***
Estimated typical busy day parking demand	Refer to **Figure 5**.
Validation	• Based on comparison with actual off-street and estimated on-street demand obtained from the surveys described in **Section 2.1.1** of the present report. Refer to **Figure 6**. • Based on comparison with the results of the questionnaire survey where the respondents were asked to indicate their parking location. The proportion of those who indicated street as their parking location matched closely the results shown in **Figure 6** for both staff and visitors/patients.
Conclusions	• Estimates based on the two approaches showed a very close match. • The pattern of the total parking demand based on on-site counts and estimated on-street parking demand attributed to the PHC is slightly higher and its pattern is smoother than that estimated based on the staff shift times and visitor/outpatient surveys. • The PHC parking demand is generally stable throughout the peak period at approximately 1,650 vehicles, including some 550 vehicles in the nearby streets and some 1,100 vehicles in the internal car parking areas. • The existing off-street parking areas are under-utilised by approximately 12%.

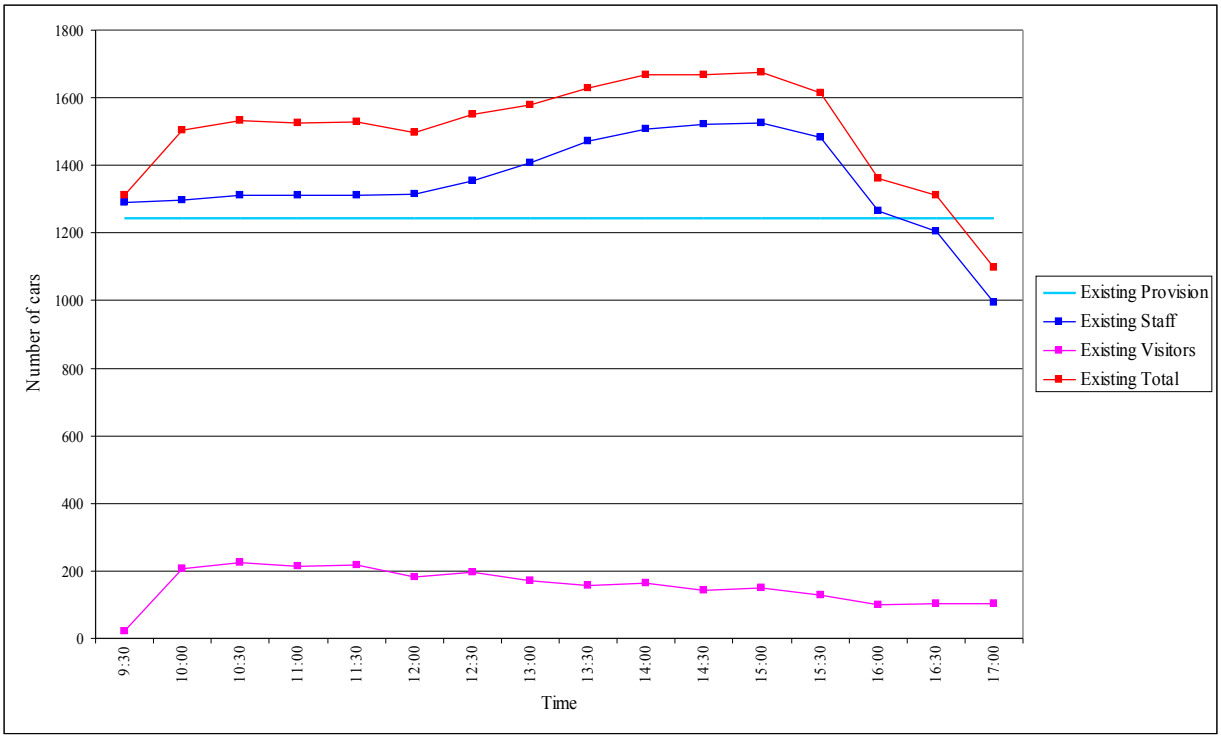


Figure 5. Hospital parking demand and provision (estimated for a typical busy day)

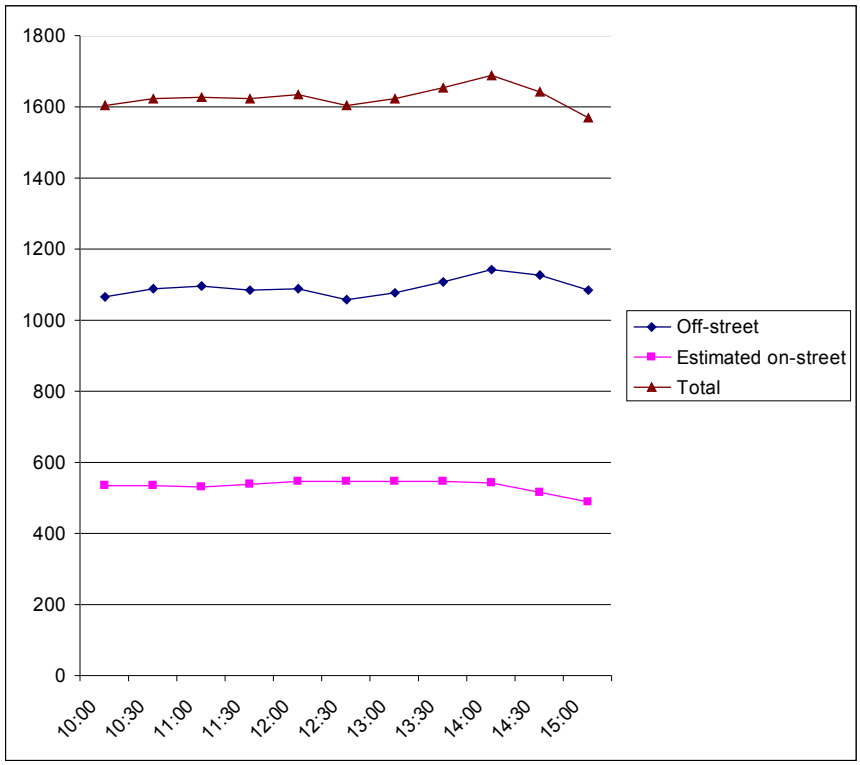


Figure 6. Actual off-street and estimated on-street parking demand generated by PHC

2.2 Street and access conditions

Characteristics of surrounding streets and access locations

Refer to **Figure 7**.

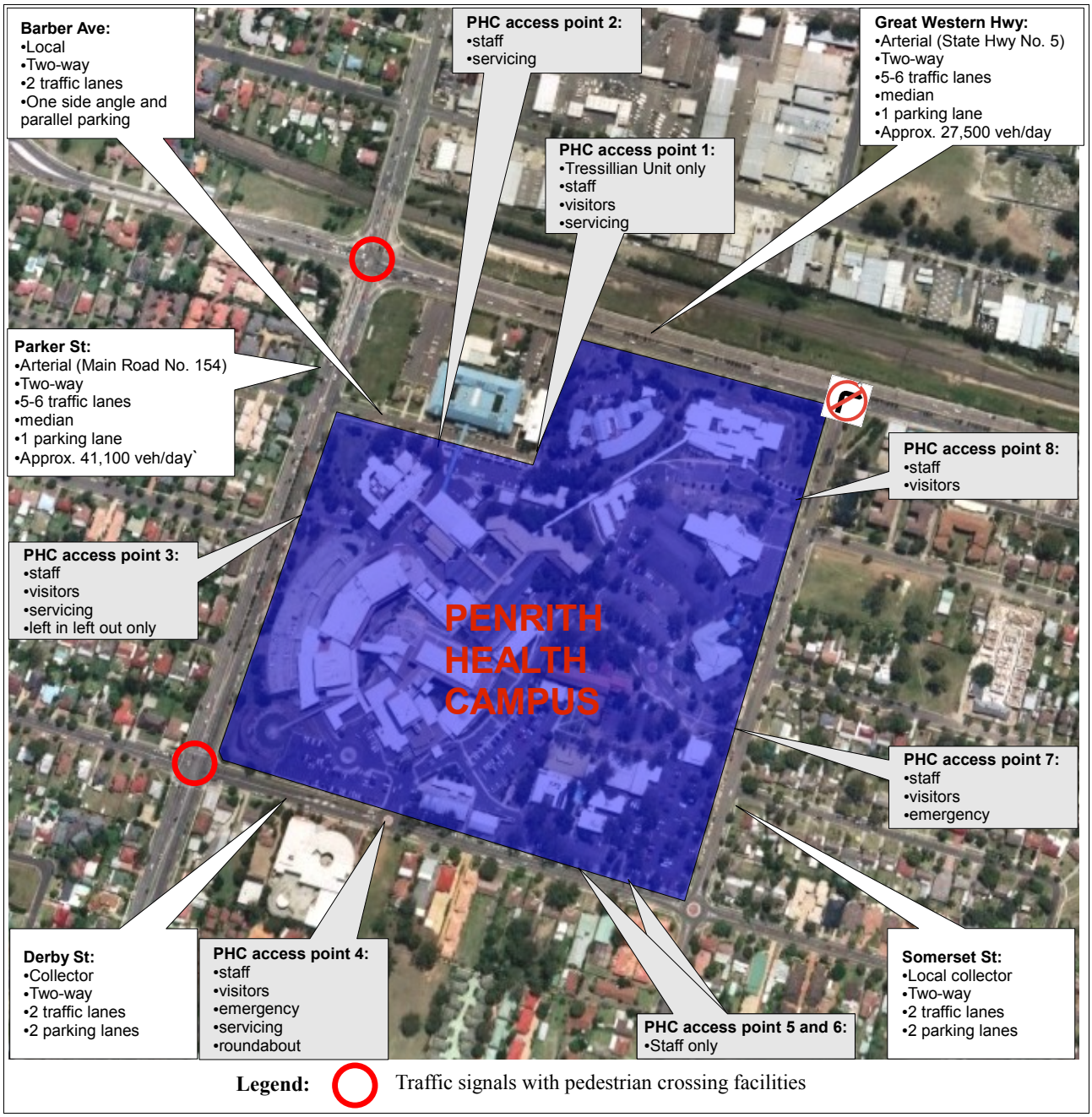


Figure 7. Characteristics of streets, intersections and access locations

Intersection traffic volume counts	Location(s)	Refer to **Figure 8**
	Date	29/04/08
	Day of the week	Tuesday
	Time period (AM)	Parker St intersections - 07:00 – 12:30 PHC access points – 06:30 – 10:00 peak hour occurred • 08:15 – 09:15
	Time period (PM)	Parker St intersections - 13:00 – 18:00 PHC access points – 13:00 – 18:00 peak hour occurred • 15:30 – 16:30

Peak hour traffic volumes are shown in **Figure 8**.

Additional traffic due to the East Block development	• Details of the analysis of the likely traffic generation due to the East Block development are presented in the PHCEB report. • Origins and destinations staff and visitor trips and their directional distribution on the street network were assumed to be the same as those obtained from the questionnaire survey results. • Peak hours of PHC arrivals/departures and peak hours on the street network were assumed to coincide (worst case scenario, because most staff and visitors arrive and depart outside the commuter peak hours). • All trips were assumed to have their origin or destination at the PHC site. • Refer to **Figure 9** for the results of traffic distribution.
Base Case scenario	The Base Case scenario for the present report • existing traffic flows plus the East Block traffic.
Intersection operation	SCATES and SIDRA INTERSECTION software packages were used to analyse the operation of critical intersections for the Base Case. The results are shown in **Table 2.4**. The results indicate that intersections generally operate at satisfactory Levels of Service with spare capacity, except the intersection of Great Western Hwy and Parker St which operates near capacity in the afternoons.

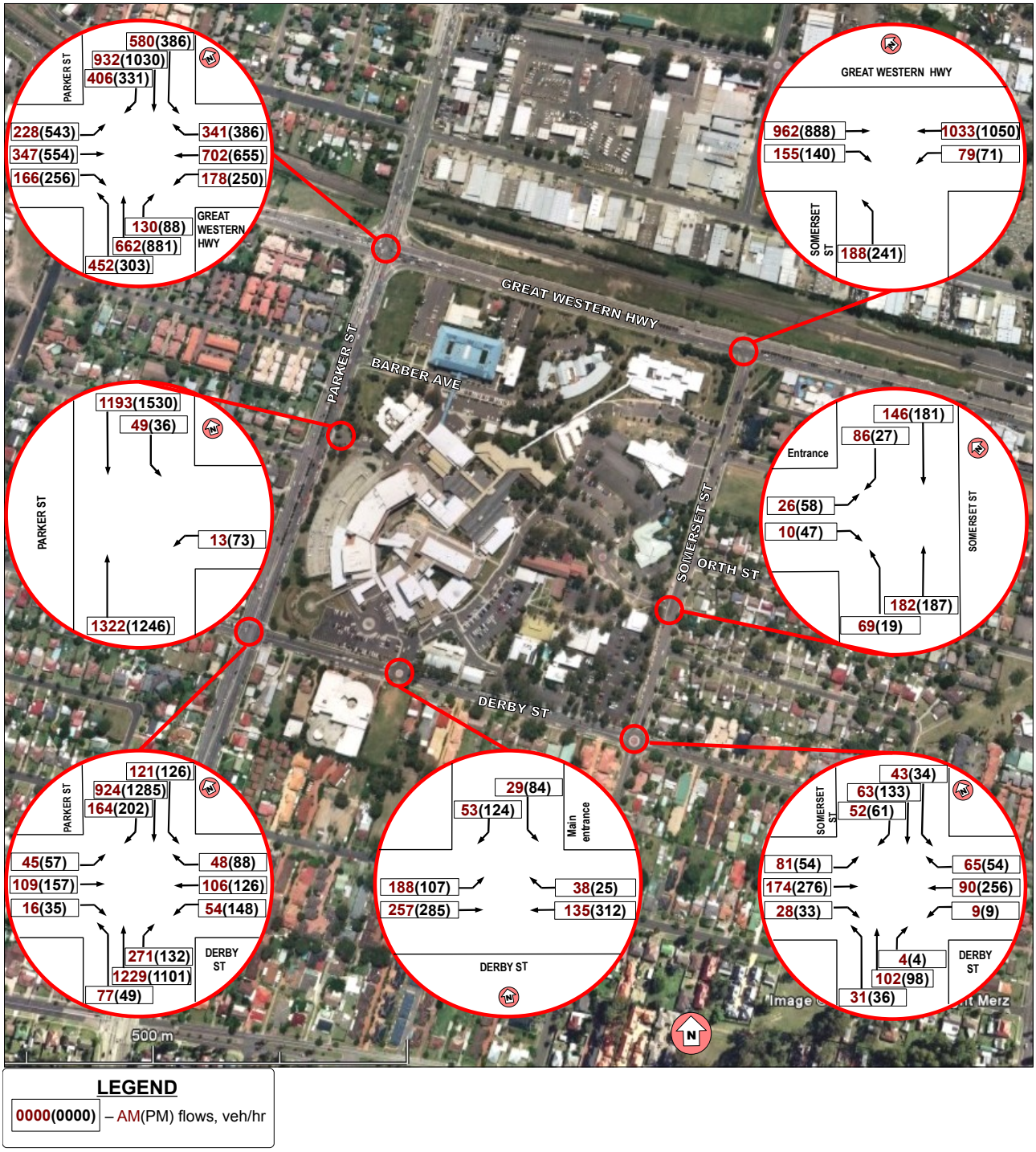


Figure 8. Existing peak hour intersection traffic volumes.

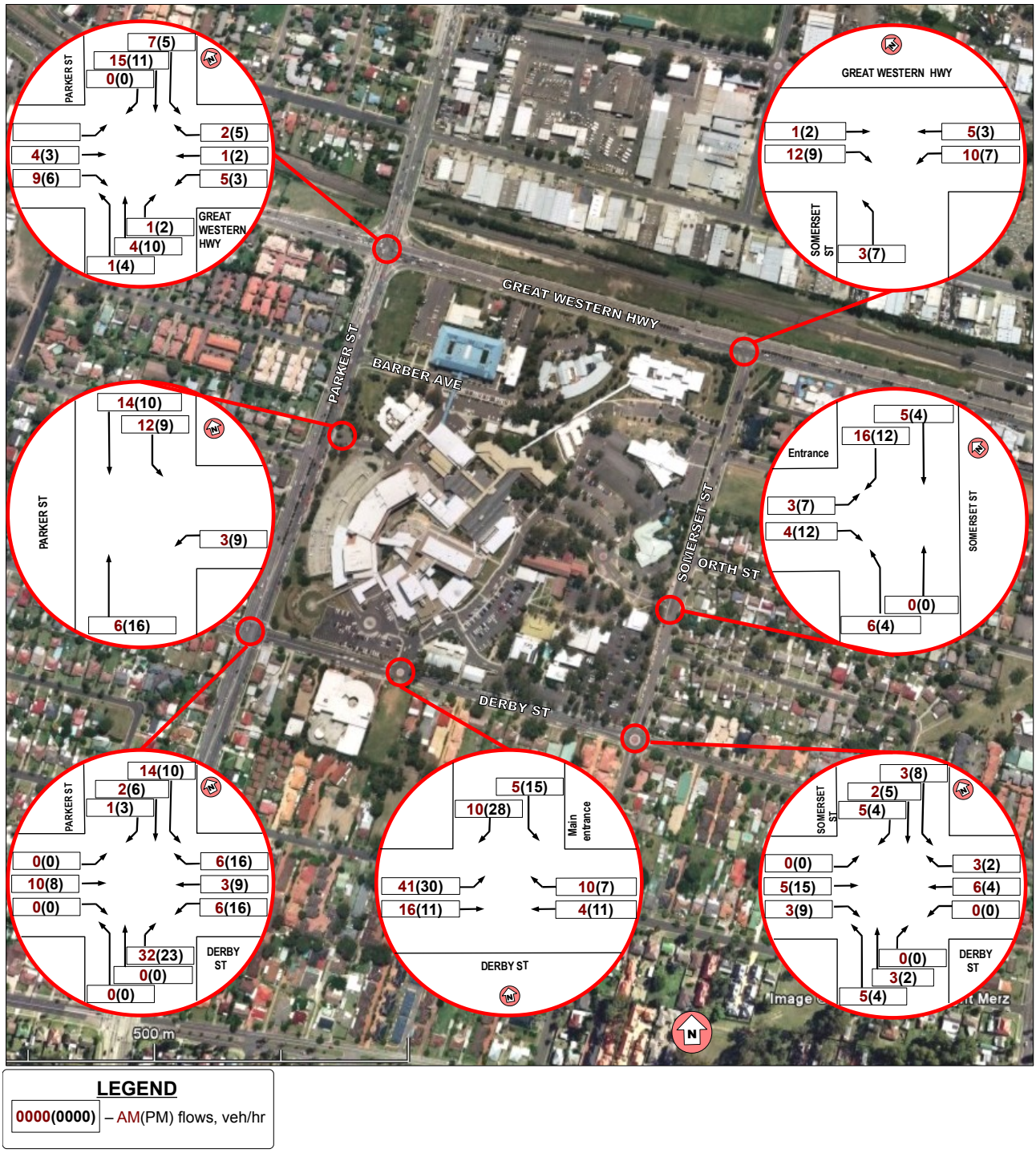


Figure 9. Additional traffic volumes on the street network as a result of Stage 3 East Block development.

Table 2.4. Results of analysis of intersection operation – Base Case (with the East Block)

Intersection	Base Case (with the East Block Development)											
	AM						PM					
	AVD	LOS	Longest queue (m) on				AVD	LOS	Longest queue, m, on			
Parker St - Great Western Hwy	27.2	B	66	GWH	WB	R	44.3	D	90	GWH	WB	T
Parker St - Derby St	24.3	B	60	PS	SB	T	28.2	B	120	PS	WB	T
Derby St - Main hospital entrance	12.9	A	28	DS	EB	T	13.6	A	25	DS	WB	T
Great Western Hwy - Somerset St	14.7	B	16	ST	NB	L	20.2	B	23.5	ST	NB	L
Derby St - Somerset St	12.7	A	18	DS	WB	T	14.0	A	25	DS	WB	T

Legend:

AVD	Average delay, sec	T	Through movement
LOS	Level of Service	R	Right hand turn
		L	Left hand turn
GWH	Great Western Hwy		
PS	Parker St	EB	Eastbound
DS	Derby St	WB	Westbound
ST	Somerset St	NB	Northbound
HE	Hospital Entrance	SB	Southbound

Level of Service criteria for intersections

Level of Service	Average delay per vehicle (sec/veh)	Traffic signals, roundabout
A	< 14	Good operation
B	15 to 28	Good with acceptable delays & spare capacity
C	28 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity; at signals, incidents will cause excessive delays; Roundabouts require other control mode

2.3 Travel modes other than private car

Sources of information

- Penrith Integrated Transport and Land Use Strategy Draft Strategy Report (PITLUS) (Cardno Eppell Olsen et al., June2008)
- NSW Government Transport Info web site www.131500.com.au
- Results of the site inspection
- Results of the questionnaire surveys

Bus

- Refer to **Figure 10** for locations bus routes and stops.
- Bus services run at approximately 10 minute intervals (all routes combined during peak hours.
- Results of questionnaire surveys indicate very low use of buses by staff (less than 1%) and visitors (3%).

Train

- Refer to **Figure 11** for Kingswood station catchment area and footpath provision between the station and PHC.
- Train services run at 30 minute intervals in each direction during the peak hours.
- Results of questionnaire surveys indicate very low use of trains by staff (2%) and visitors (none).

Bicycle

- Refer to **Figure 12** for existing and proposed bicycle network.
- Results of questionnaire surveys indicate very low use of trains by staff (less than 1%) and visitors (none).
- Bikeway connections to the PHC are limited and non-continuous, particularly in the north-south direction.

Figure 10. Existing bus services.

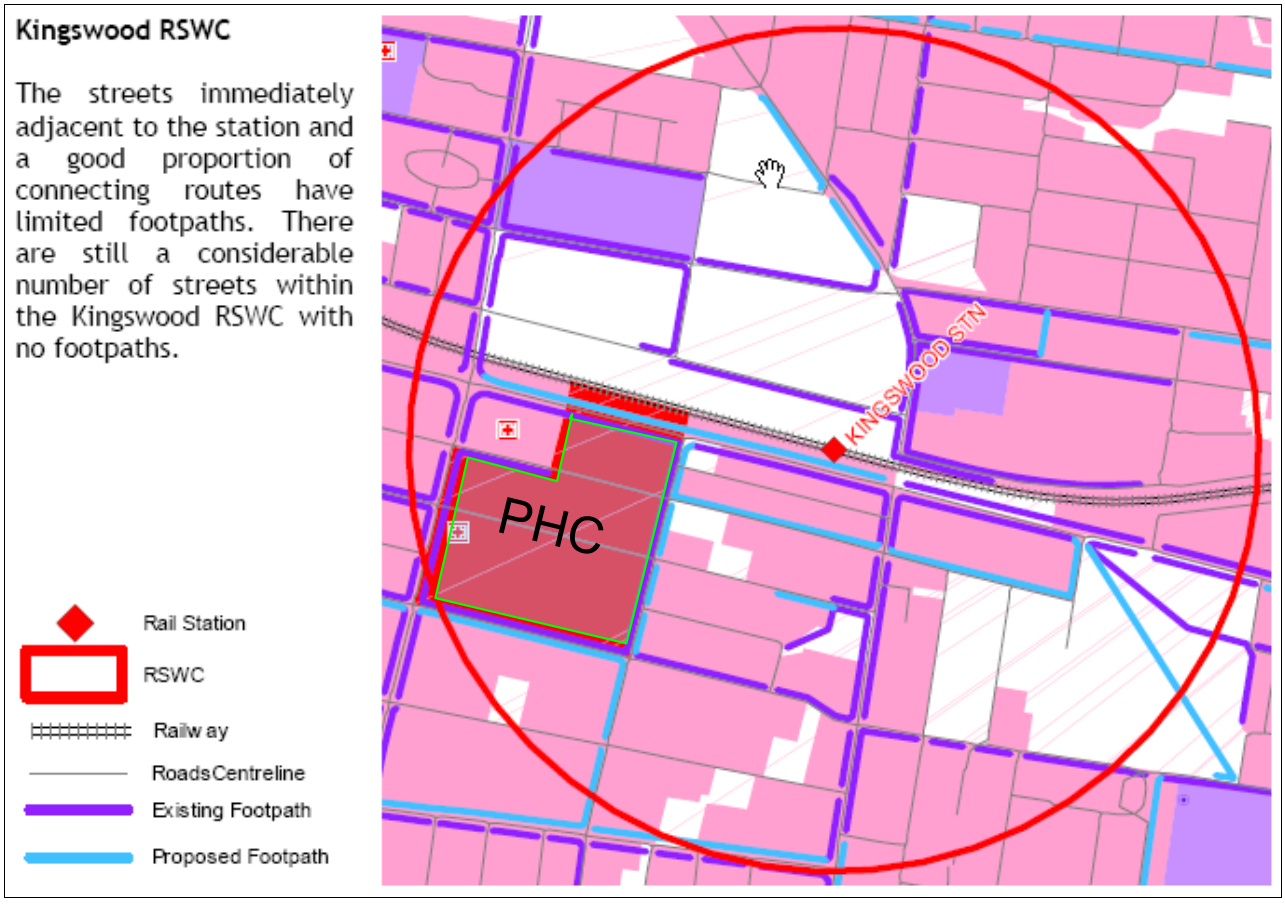


Figure 11. Kingswood station catchment area and footpath provision (source: Cardno Eppell Olsen June2008).

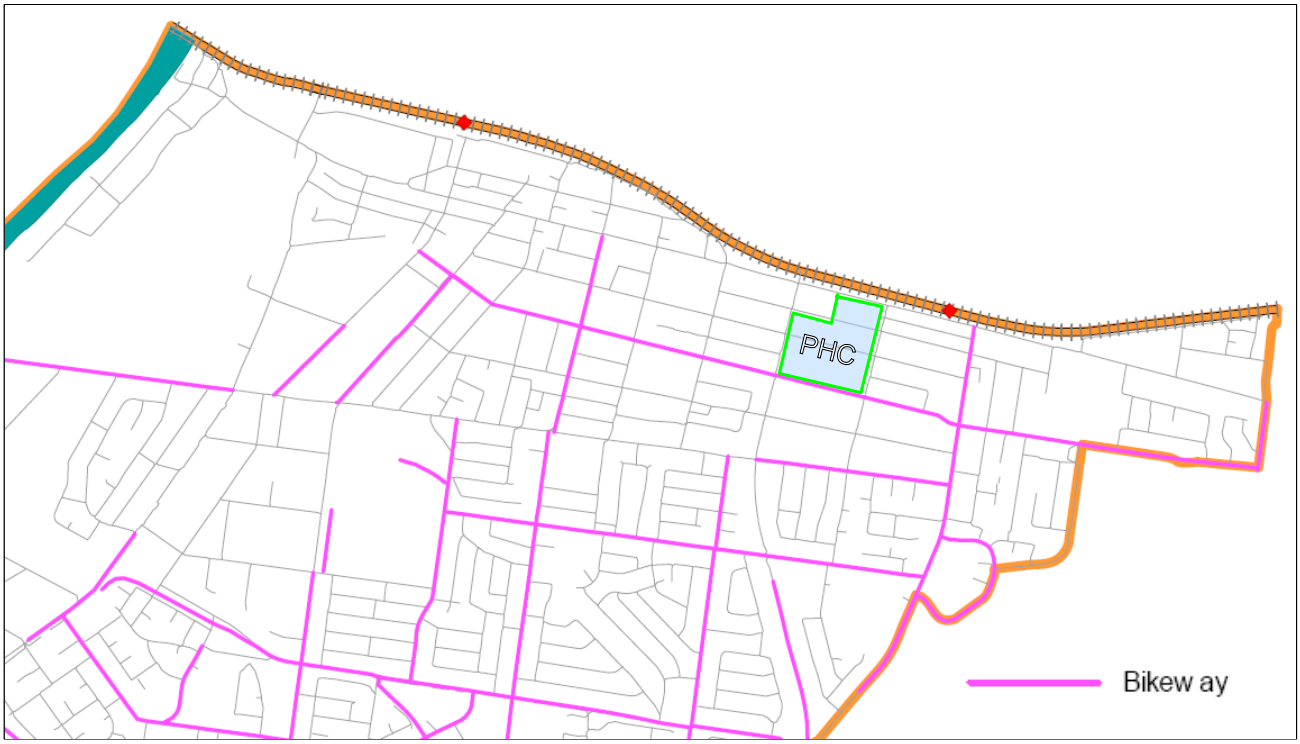


Figure 12. Existing and proposed bicycle network (source: Cardno Eppell Olsen et al., January 2008).

Walking

- Refer to **Figure 9** for locations of footpaths around the PHC site.
- Refer to **Figure 13** for locations of footpaths within the PHC site.
- Internal system of corridors provides connections between the hospital buildings.
- Footpaths are mostly level.
- Formal pedestrian paths within the site lack connections in a number of locations.
- Most footpaths are not protected from adverse weather conditions.
- Wayfinding requires improvement (SCAPE (2010) Wayfinding report).
- Provision of pram ramps is inconsistent (SCAPE (2010) Wayfinding report).
- Footpaths are relatively narrow and lack available space to stop (to rest, wait, speak to others etc.) (SCAPE (2010) Wayfinding report).
- There is no supportive directional signage to Kingswood station and local bus stops (SCAPE (2010) Wayfinding report).

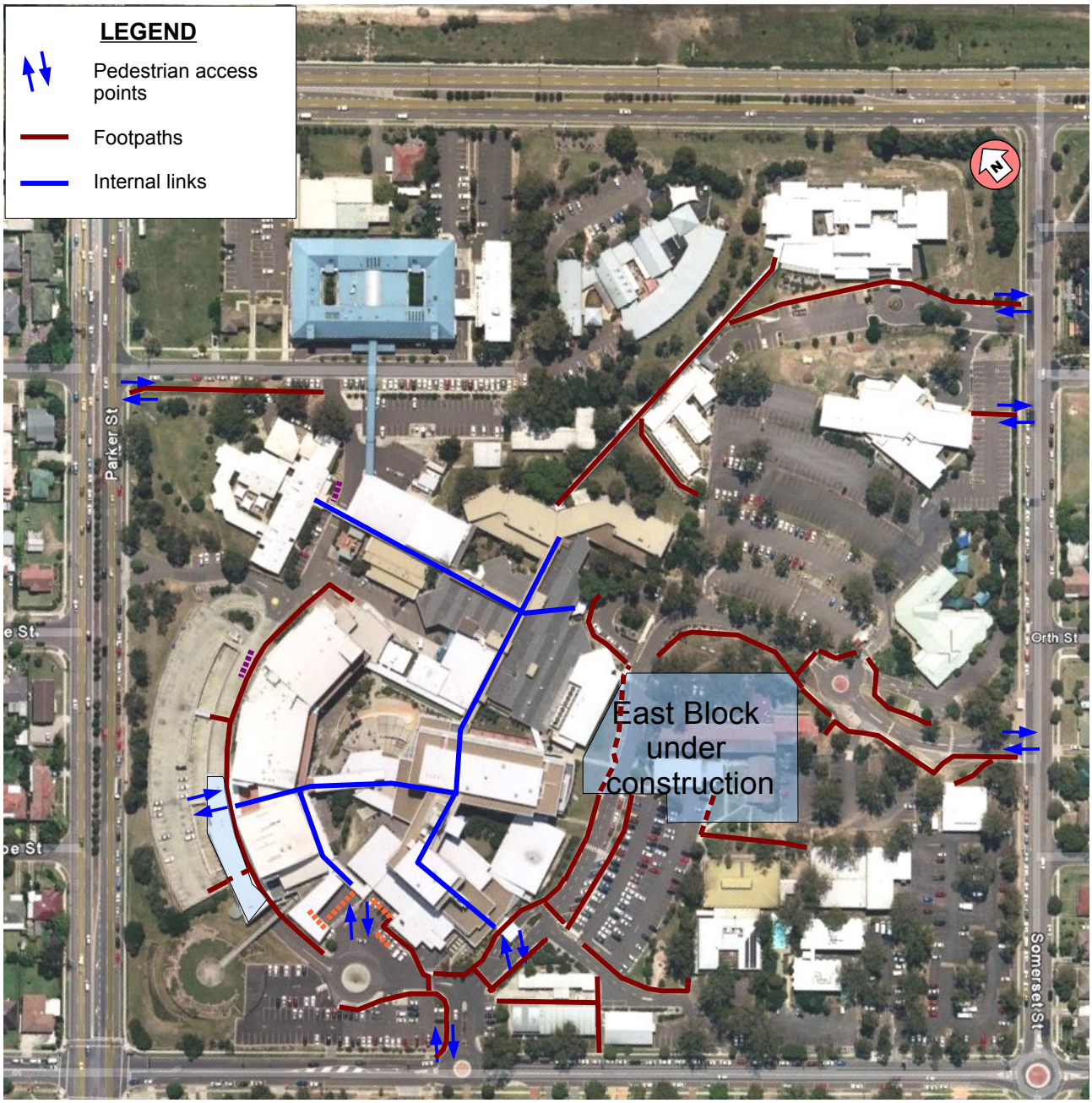


Figure 13. Footpath provision on the PHC site.

3 PROPOSED STAGE 3A MENTAL HEALTH DEVELOPMENT

Proposed redevelopment	It is proposed that the existing Mental Health Unit (Pialla Unit located in the north-western corner of the site) be demolished and a new Mental Health Service (MHS) building be constructed east of the Derby Street entry to the site (refer to **Figure 14**). The existing Pialla Unit provides 33 beds. The proposed MHS will provide a total of 64 beds. The total bed increase is 31. The proposed services will be similar to those which currently exist at the PHC.
Building and car parking area design	Refer to drawings prepared by Woods Bagot.

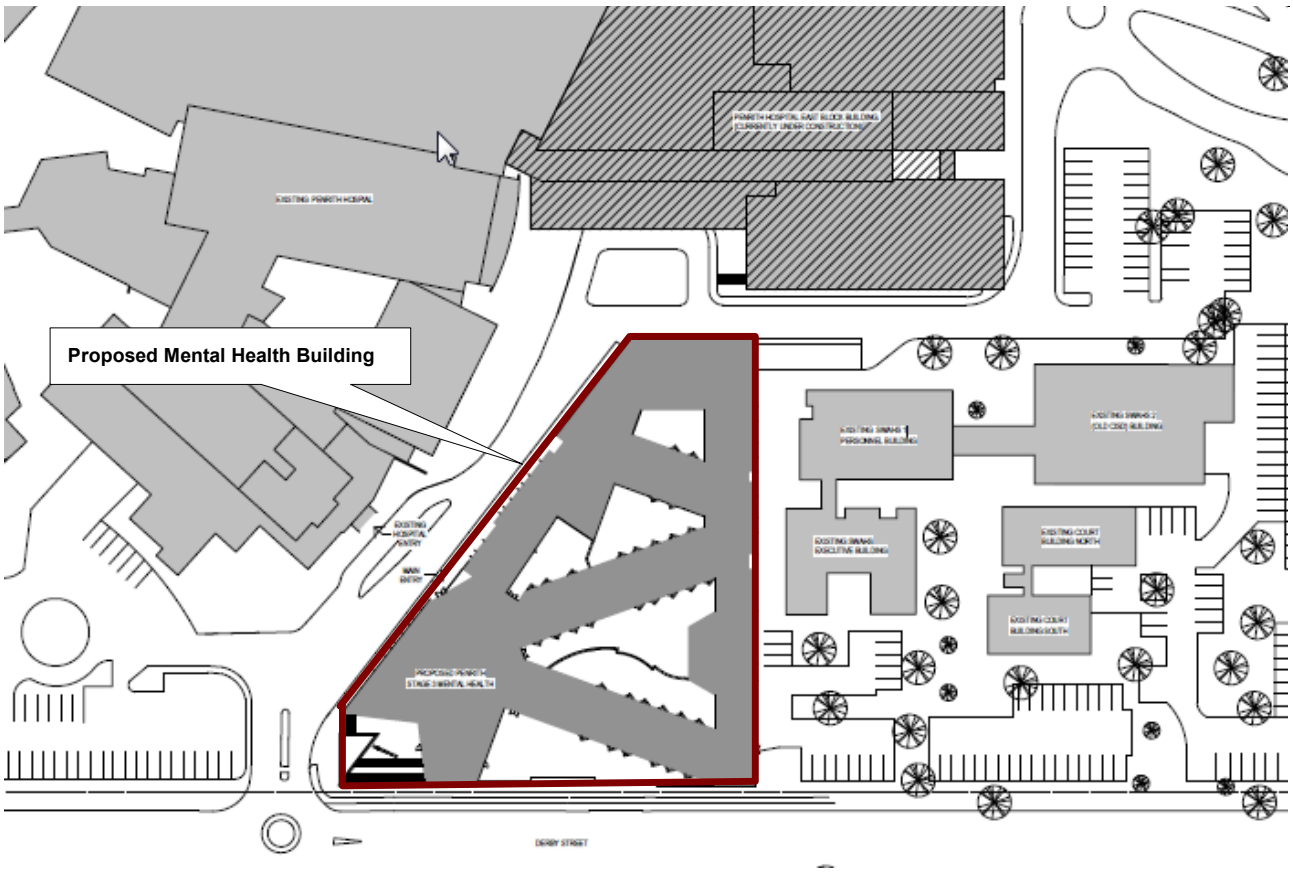


Figure 14. Proposed MHS location.

4 IMPACTS OF THE PROPOSED DEVELOPMENT

4.1 Planning framework

NSW Government's Metropolitan Strategy and Metropolitan Transport Plan

DEVELOP PENRITH AS A REGIONAL CITY	• Implement the Cities Taskforce plans for Penrith, and consider the recommendations of the Centres Reinvigoration Report. (NW B3.1.1) • Investigate opportunities to strengthen connections between the UWS Penrith Campus, Nepean Hospital and Penrith Regional City. (NW B3.3.1) • Prepare a structure plan for the North Penrith Defence Lands to complement the existing city centre and the draft Penrith City Centre Plan. (NW B2.1.2)

Aims:

- increasing the use of
  - walking
  - cycling
  - public transport
- appropriately co-locating new urban development with existing and improved transport services
- improving the efficiency of the road network

Relevance to MH / impacts of MH:

- Proposed strengthened connections between PHC, UWS and Penrith Regional City are likely to encourage the use of public transport and cycling

NSW State Plan	**Target** Increase the average proportion of journeys to work by public transport in the Sydney Metropolitan Region to 25% by 2016.

NSW Planning Guidelines for Walking and Cycling	Contain information, concepts, case studies and illustrations designed to assist planners in improved planning for walking and cycling.
	Items relevant for the proposed MH development:
	• References to other associated policies and guidelines
	• Concepts and principles for local walking and cycling networks
	  ▪ Coherence
	  ▪ Directness
	  ▪ Safety
	  ▪ Attractiveness
	  ▪ Comfort.
	• General guidance for preparation of
	  ▪ Transport Management and Accessibility Plan (TMAP)
	  ▪ Transport Access Guides (TAG)
	  ▪ Bicycle parking and end-of-trip facilities

Integrated Land Use and Transport policy package	The Integrated Land Use and Transport (ILUT) package (DUAP 2001) provides a framework for State government agencies, councils and developers to integrate land use and transport planning at the regional and local levels. The policy package consists of five documents: • Overview of ILUT - also includes an explanatory note on accessibility criteria for including urban land in the Urban Development Program • Right Place for Business and Services Planning Policy • Improving Transport Choice - practice guidelines on how to implement the policy ▪ Includes ten accessible development principles. Principle 6 is "improve pedestrian access" and Principle 7 is "improve cycle access". Detailed design criteria are included for each. • Summary of Employment and Journey to Work Patterns in the Greater Metropolitan Region - key statistics that will help land use and transport policy development
Council's objectives	PITLUS sets out aims and objectives for future land use and transportation system development in Penrith LGA. These include, amongst others, the following • **Increase public transport use per capita** • *Increase opportunity for people to travel by public transport to major destinations* • *Increase public transport use by upgrading the viability of public transport as a convenient and safe alternate to the private car* • **Decrease motorised private vehicle use per capita** • *Decrease the use of motorised private vehicles by providing more non-car based opportunities for travel* • *Reduce Car Dependency* • *Reduce Car Use* • **Decrease the number and length of trips per capita including those on public transport** • *Reduce the need to travel* • *Reduce the number and length of trips including those on public transport* • **Improve access to jobs and other economic activities** • *Improve the freight network* • *Improve Road Network Efficiency*

4.2 Parking demand and provision

4.2.1 Council's car parking requirements

Planning control document	Penrith City Council's Development Control Plan (DCP) Part 2 Section 2.11 Car Parking • Hospitals ▪ 1 per 3 beds plus 1 per 3 employees	
Number of additional staff	Basis for analysis	Analysis of existing staff profiles identified • staff by facility and by FTE; • the proportion of staff working standard hours (generally 8-9am to 4-5pm); • the two largest groups of employees were nurses and administrative staff. • Administrative staff generally work standard hours i.e. starting between 8.00-9.00 am and finishing between 4.00-5.00pm. • Nurses and the majority of other staff generally work in three main shifts: ▪ morning shifts (generally starting between 7:00-8:30am and finishing between 3:30-4:30pm); ▪ afternoon shifts (generally starting between 1:00-2:00pm and finishing between 10:00-11:00pm); ▪ night shifts (generally starting at 10:30pm and finishing at 7:00am). • for shift workers the general staffing ratio was 0.55 of FTE for morning shifts, 0.24 of FTE for afternoon shifts, and 0.12 of FTE for evening shifts (following discounting of FTE to a factor of 0.9 to account for staff absence due to sick leave, holidays etc.)
	Estimated actual number of staff	• Existing and proposed staff numbers were provided by Savills Australia. These were expressed in Full Time Equivalent (**FTE**) **values** which **do not equal to the number of staff on site** at any one time. The additional number of FTE staff is proposed to be 92 (an increase from 100 to 192). • **Design time period** - morning (**busiest**) shift • FTE numbers were converted into the actual number of staff on site at any one time using ▪ existing ratios of nursing staff engaged in morning, afternoon and night shifts ▪ for staff working normal business hours - factors to account for normal and sick leaves and RDOs • The total proposed additional maximum number of staff on site during the morning shift – **51**

Parking requirement	31 beds / 3 = 10 plus 51 employees / 3 = 17, a total of 10 + 17 = **27** car parking spaces.

4.2.2 RTA car parking requirements

RTA (2002) Guide

No requirements for public hospitals.

For **private** hospitals RTA (2002) recommends the following formula for parking provision calculation.

PPA = -19.56 + 0.85 B + 0.27 ASDS

where PPA is Peak Parking Accumulation;

B is number of beds; and

ASDS is Average number of staff per weekday shift.

Applicability – for comparison purposes.

Application of the above formula for the proposed MHS results in the parking provision requirement of 21 car parking spaces.

It is noted that the result obtained using RTA rates for private hospitals is similar to that calculated using Council's DCP in **Section 4.1.1** of the present report.

4.2.3 Proposed car parking provision

Number of car parking spaces

The proposed redevelopment will result in a loss of some parking spaces and construction of the new car parking spaces as detailed below.

Spaces to be deleted (refer to Figures 2 and **3)**

Car parking area	Number of spaces
5a	9
6	23
10	74
10a	8
Total	**114**

Spaces to be provided / reinstated

Accessible spaces along the western frontage – 2

Car park on the eastern side of the building – 28

Total 30

The proposed development will result in a net reduction of parking provision by

114 – 30 = 84 spaces

Compliance of future car parking provision

Parking requirements for the numbers of staff and beds after Stage 3 East Block

with parking controls	redevelopment are calculated in the table below.

Car parking requirements	**Beds** 474 after EB + 31 MHS = 505 / 3 = 168 parking spaces plus **Employees** The number of employees at any one time varies due to a complex pattern of shift start and end times at different facilities and for different staff categories. On average, there are approximately 1,600 staff present on site during the morning (busiest) shift. The East Block will add 182 employees to this number. 1,782 after EB + 51 MHS = 1,833 / 3 = 611 parking spaces, **Total DCP requirement:** 168 + 611 = **779** car parking spaces.
Total proposed parking provision	1,358 spaces after EB – 84 spaces after MHS = **1,274 spaces**
Car parking compliance	The proposed provision of 1,274 parking spaces at PHC will fully comply with and exceed Council's DCP requirements by 495 spaces or 39%.

Design checks

Item	Check	Result of assessment
Dimensions of car parking spaces, driveways and circulation roadways	AS/NZS 2890.1:2004 AS 2890.2-2002	Satisfactory Satisfactory
Vehicle manoeuvring	using AutoTrack 8.2 software	Satisfactory, subject to minor design changes which can be easily accommodated Refer to **Appendix B** for vehicle turning diagrams.

4.2.4 Parking impacts

Actual demand

Actual additional maximum parking demand generated as a result of Stage 3A MH redevelopment may be estimated as 132 spaces (during the periods of peak parking demand, approximately between 9:00 and 15:00). This estimate is based on the survey results detailed in **Section 2.1** of the present report.

Effect on car parking availability	Vacant on-street spaces may be found in local streets east of Somerset St and west of Parker Street. Survey results contained in **Table 2.3** of the present report indicate that at least 200 vacant spaces are available in the surrounding streets. When distributed on the street network, additional parking demand will be in the order of 16 cars per street on the nearest streets marked in **Figure 4**. Note that these streets are generally only within 400-450 m from PHC. More on-street parking is available further away from the site. It is noted that the periods of peak parking demand are outside the periods of peak parking demand generated by local residents. There will be little or no direct effect on resident parking.
Important considerations	The above estimated actual demand is based on the assumption that both staff and visitors would continue to have their car mode share at the same levels as at present. However, as identified earlier in this report and in a greater detail in the SCAPE (2010) Needs report, the existing car mode share is (1) the worst case scenario (2) is expected to be reduced if appropriate measures are implemented. These measures are identified in the following Section of the present report.

4.2.5 Measures to reduce car parking impacts

Bicycle facilities	The proposed building incorporate the following end-of-trip facilities to encourage bicycle use • One shower with 10 staff lockers located inside the changing facilities adjacent to the shower . • 10 staff bicycle parking spaces - protected from the weather, able to lock wheel and frame in accordance with AS2890.3, located in proximity to the entrance to the car park or office area, visible, well lit, well signposted and with good passive surveillance. • 5 visitor bicycle parking spaces - protected from the weather, able to lock wheel and frame in accordance with AS2890.3, located in an accessible location that is clearly signposted.
Additional parking provision	Health Infrastructure is considering construction of a multi-level car park as part of Stage 4 of PHC redevelopment. Subject to further design development it is likely to increase on-site parking provision to cater, in addition to DCP requirements, for at least part of the current actual parking shortfall and the actual parking demand generated as a result of Stages 3 and 4. Health Infrastructure is also considering improvements for line marking in the existing main car parking area 13 (refer to **Figure 2**). This car park is currently inefficiently marked and has a potential of providing more car parking spaces if redesigned in accordance with AS/NZS 2890.1:2004. It is recommended that Health Infrastructure develops a PHC Car Parking Strategy (PHCCPS) tied to future phases of the PHC development. The PHCCP Strategy should identify • potential additional car parking areas, • measures to improve efficiency of their access and practical capacity, • additional practical measures to discourage personal car use and encourage

alternative modes of travel, including a plan for implementation.

The CCP Strategy should also investigate the viability of preparation and implementation of a Workplace Travel Management Plan for the whole of PHC Campus.

Increase public transport use	• **Bus**
	  ▪ Upgrade the existing bus stops near PHC to provide sheltered facilities.
	  ▪ Update the PHC maps to include the Derby Street bus stops.
	  ▪ Introduce on site signage directing people to bus stops.
	• **Train**
	  ▪ PHC is within the catchment area of Kingswood station .
	  ▪ Update the PHC maps to include the rail line and Kingswood station.
	  ▪ Introduce on site signage directing people to Kingswood station.
	• Implement an improved employee induction program to include the one off issue of a free weekly train/bus pass.

Information	• Update the PHC website to include details of public transport and cycle facilities. • Develop and produce a Transport Access Guide (TAG). TAG shall include information on public transport and cycleways (including nearest bicycle repair services). Distribute TAG to all existing staff. Include TAG into the induction package for all new employees and regular visitors (for example students). Make TAG available at the reception in each facility. • Make all staff aware and encourage the use of www.131500.com.au by regular emails and by inclusion in TAG. • Introduce a system which would inform staff members about other staff who reside in their neighbourhood, for the purposes of car pooling. • Prepare and distribute a guide on health benefits of walking and cycling.
Penrith Commuter Car Park	• The NSW Government has announced that a 1,000 space commuter car park will be constructed near the Penrith rail station. • It may assist some staff with their travel and parking arrangements, should they choose to drive to and park in the new commuter car park and then take a bus or train to the hospital.
Likely effects of the above measures	• It is expected that the above measures, combined with the limited on-site car parking provision will reduce the car mode share of both staff and visitors of PHC. • The expected actual car parking demand with the existing car mode share is in the order of 1,800 cars. For every 1% of reduction of the car mode share the expected reduction in parking demand is 18 cars. As identified in SCAPE (2010) Needs report, the average car mode share in the PHC travel zone is 82% compared with 93% identified by TEF surveys. The ultimate reduction of the car parking demand by some 200 cars may thus be achievable. • Increased distances from on-street parking locations due to increased demand are likely to lead to a better utilisation of off-street parking. Currently the underutilisation is in the order of 12% or some 250 cars. This can be expected to reduce to 5-7% or by 100-140 cars.

- It is recommended that a review of the parking situation at the PHC Campus be undertaken 18 to 24 months after the Mental Health facility commences its operation. The review should include the following.
  - comprehensive surveys of travel modes and travel and parking patterns of staff, patients and visitors,
  - identification of efficiency of the parking demand reduction measures described above, including comparison of people travelling habits before and after their implementation
- The results of the review should be considered in the PHC Car Parking Strategy and the Workplace Travel Plan

4.3 Demand on non-car modes of travel

Adequacy of the proposal	• The anticipated maximum reduction of the car mode share of both staff and visitors of PHC is in the order of 11%. • For the proposed MH development, this translates into additional approximately 5 staff and one (1) visitor travelling by public transport or cycling and/or walking. • The existing capacities of public transport as well as existing and proposed cycleways and footpaths will easily accommodate this increase. • The existing footpath network on the PHC site will largely remain. It is proposed to create an upgraded (widened) pedestrian link along the western frontage of the MH building. A 3 metre wide footpath is also proposed along the northern frontage of the MH building. • Refer to **Figure 15** for location of existing and proposed footpaths. • New footpaths offer improved connectivity and improved level of service by providing greater widths and some awnings.

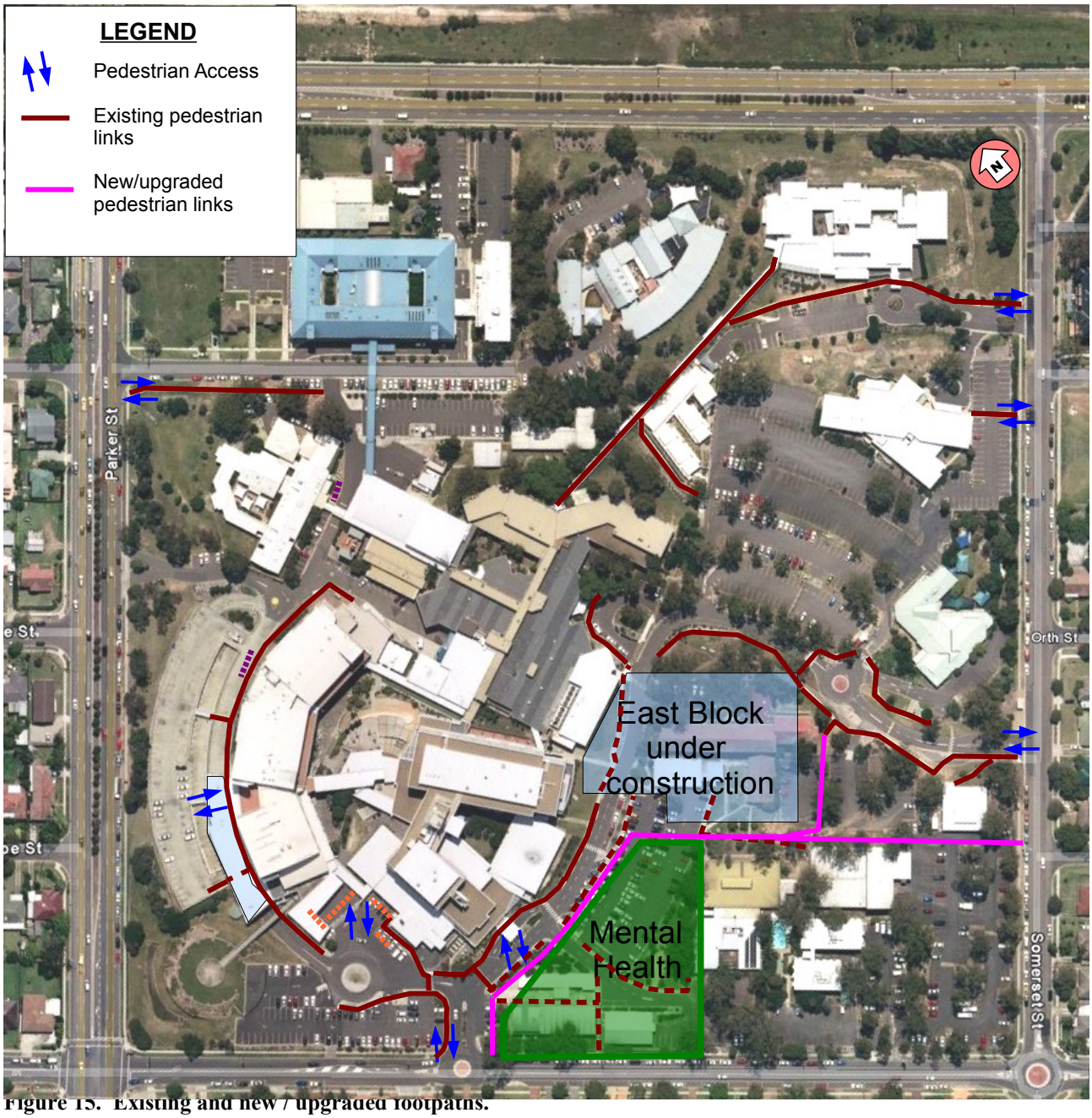


Figure 15. Existing and new / upgraded footpaths.

4.4 Impacts on the road network

Additional traffic generation	Basis for analysis	• Results of the surveys described in **Sections 2.1** and **2.2** of the present report ▪ arrival and departure traffic flows through the PHC access points, including existing proportion of peak hour traffic compared with total number of cars arriving and departing; ▪ origins and destinations staff and visitor trips and their directional distribution on the street network from the questionnaire survey results.

		• The spreadsheet model based on staff attendance information, accounting for staff accumulation overlaps due to various shift times. The model included **staff arrival and departure patterns** for each facility and each staff category by half-hour throughout the day. It was found that between

		• The total additional maximum number of
		  • staff cars on site or on street during the morning shift: (51 staff) x (0.93 cars/person) = 47 cars
		  • cars belonging to visitors: (31 beds) x (0.45 visitors per bed) x (0.45 cars/person) = 6 cars.
		  • Note that the peak parking demand hours for staff and visitors do not coincide.

	Assumptions	• All incoming and outgoing trips use PHC site access points. This represents the worst case scenario in terms of trip concentration at particular intersections. In reality, all additional vehicles will park in the vicinity of PHC and will not use critical intersections of Parker St / Derby St and Derby St / Main Entrance.
		• For the assessment purposes additional peak PHC traffic volumes were superimposed onto the street peak traffic, to represent the worst case scenario. In actual fact, morning and afternoon peak hours for PHC traffic generation do not coincide with the street peak traffic hours.
	Number of trips	• **Morning peak hour arrivals** constitute 44% to 56% of total morning arrivals calculated based on the roster analysis and 40% based on the actual traffic counts. For additional traffic generation, the worst case scenario of 56% of 47 staff cars (**27 trips/hr**) was utilised for traffic impact assessment.
		• **Morning peak departures** were assumed to be 33% of the incoming traffic (**9 trips/hr)**, based on the same proportion of outgoing traffic calculated from the survey results.
		• **Afternoon peak hour departures** constitute 41% of total afternoon departures calculated based on the roster analysis and 32% based on the actual traffic counts. For additional traffic generation, the worst case scenario of 41% of 51 staff cars (19 trips/hr) and 100% of 6 visitor cars (6 trips/hr) were utilised for traffic impact assessment (a total of **25 trips/hr**).
		• **Afternoon peak hour arrivals** were assumed to be 63% of the incoming traffic (**12 trips/hr**), based on the same proportion of incoming traffic calculated from the survey results.
Traffic distribution on the street network	Assumptions	• Origins and destinations staff and visitor trips and their directional distribution on the street network will be the same as those obtained from the questionnaire survey results.

		• Peak hours of PHC arrivals/departures and peak hours on the street network will coincide. • All trips will have their origin or destination at the PHC site.
	Additional traffic volumes on the street network.	• The additional turning movements at the nearest intersections will be very minor, under 10 vehicles per hour • Refer to **Figure 16**.
Capacity of streets and intersections	SCATES and SIDRA INTERSECTION software packages were used to analyse the operation of critical intersections after Stage 3 redevelopment. The results are shown in **Table 4.1**, together with the results of assessment of the existing intersection operation for comparison. The results indicate that the surrounding streets and intersections will continue to operate at the same Levels of Service as at present, with negligible increases in average delays and queuing.	

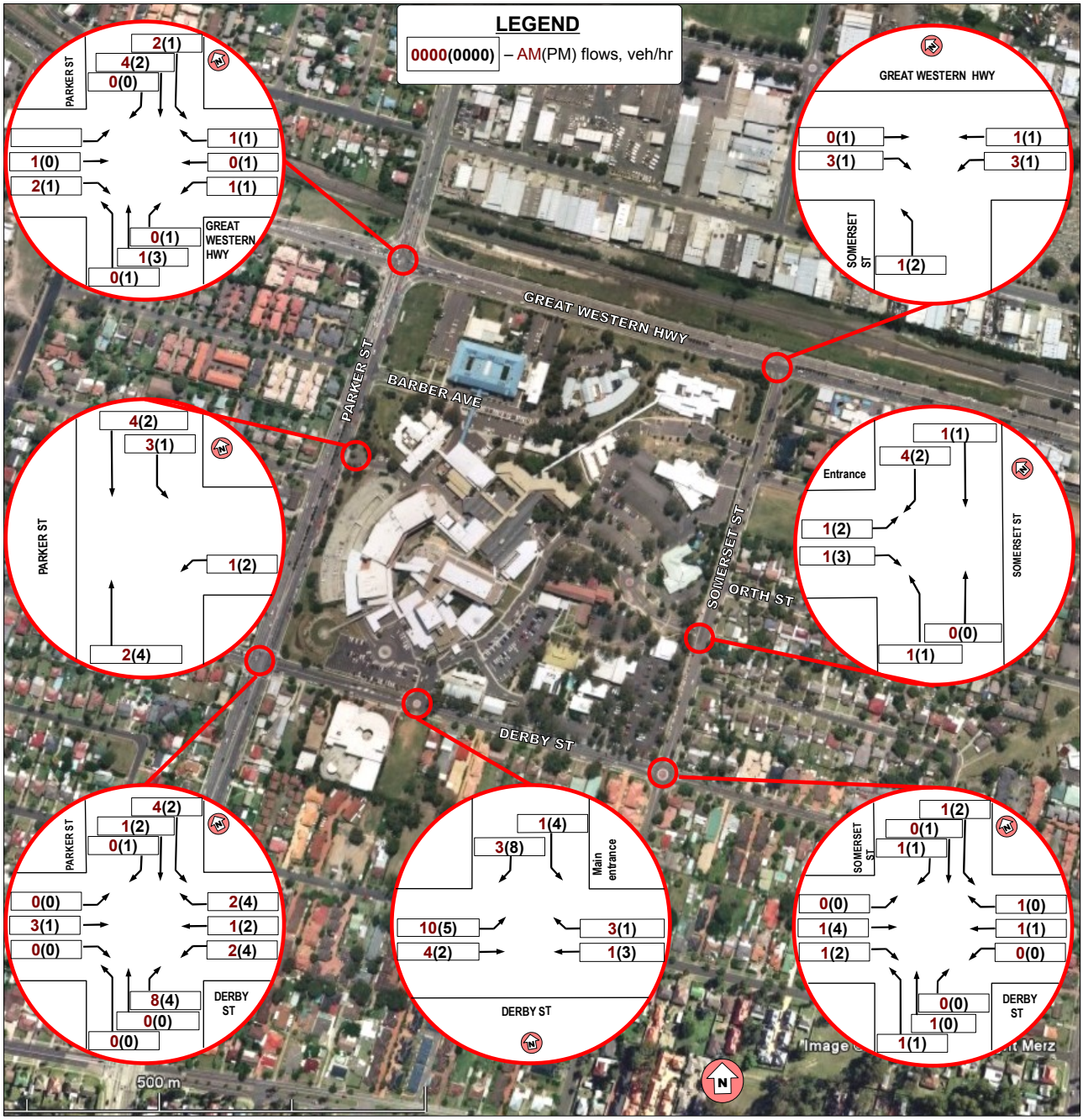


Figure 16. Additional traffic volumes on the street network as a result of Stage 3A MH redevelopment.

Table 4.1. Results of analysis of intersection operation – Base Case and after Stage 3A MH

Intersection	Base Case (with the East Block Development)											
	AM						PM					
	AVD	LOS	Longest queue (m) on				AVD	LOS	Longest queue, m, on			
Parker St - Great Western Hwy	27.2	B	66	GWH	WB	R	44.3	D	90	GWH	WB	T
Parker St - Derby St	24.3	B	60	PS	SB	T	28.2	B	120	PS	WB	T
Derby St - Main hospital entrance	12.9	A	28	DS	EB	T	13.6	A	25	DS	WB	T
Great Western Hwy - Somerset St	14.7	B	16	ST	NB	L	20.2	B	23.5	ST	NB	L
Derby St - Somerset St	12.7	A	18	DS	WB	T	14.0	A	25	DS	WB	T

Intersection	After Stage 3A Mental Health											
	AM						PM					
	AVD	LOS	66				AVD	LOS	Longest queue, m, on			
Parker St - Great Western Hwy	27.2	B	78	PS	SB	R	44.7	D	90	GWH	WB	T
Parker St - Derby St	24.6	B	60	PS	SB	T	29.1	C	84	PS	WB	T
Derby St - Main hospital entrance	13.0	A	28.9	DS	EB	T	13.6	A	23.8	DS	WB	T
Great Western Hwy - Somerset St	14.7	B	16	ST	NB	L	20.4	B	23.9	ST	NB	L
Derby St - Somerset St	12.7	A	18	DS	WB	T	14.1	A	25	DS	WB	T

Legend:

AVD	Average delay, sec	T	Through movement
LOS	Level of Service	R	Right hand turn
		L	Left hand turn
GWH	Great Western Hwy		
PS	Parker St	EB	Eastbound
DS	Derby St	WB	Westbound
ST	Somerset St	NB	Northbound
HE	Hospital Entrance	SB	Southbound

Level of Service criteria for intersections

Level of Service	Average delay per vehicle (sec/veh)	Traffic signals, roundabout
A	< 14	Good operation
B	15 to 28	Good with acceptable delays & spare capacity
C	28 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity; at signals, incidents will cause excessive delays; Roundabouts require other control mode

4.5 Impacts of construction traffic

4.5.1 Proposed works

Purpose of assessment	To address the Director General's requirements
Assessment constraints	Typically, assessment of impacts of construction traffic and preparation of Traffic Management Plans and Traffic Control Plans is required immediately prior to the construction stage of a development. There is insufficient information for a detailed traffic impacts assessment until a builder is appointed and the construction program is developed. The present assessment is therefore limited to the evaluation of the existing site and road network constraints and recommendations arising from such evaluation.
Type of works	Construction of new hospital facilities.

Quantities of	
• **excavated earth**	• unknown at this stage,
• **construction material**	• unknown at this stage,
• **fittings**	• unknown at this stage,
• **other supplies**	• unknown at this stage,
Possible types of vehicles	• Small Rigid Vehicles (SRV), • Medium Rigid Vehicles (MRV), • Heavy Rigid Vehicles (HRV), • Articulated Vehicles (AV), including B-Doubles (BD) as per definitions of AS 2890.2-2002.
Frequency of truck movements	Cannot be determined at this stage due to unknown material quantities.
Duration of construction period	• Commencement of works - mid April 2011 • Completion - September 2012

4.5.2 Road network constraints

Roads unsuitable for construction traffic	Local roads within residential areas, as shown in **Figure 17**, shall not be used.
Roads suitable for construction traffic	Main roads provide opportunities for delivery of construction materials and removal of excavated earth / demolition materials. Preferred and acceptable roads are shown in **Figure 17**.
B-Double and high vehicle restrictions	RTA approved roads for B-Doubles and high vehicles are shown in **Figure 17**.

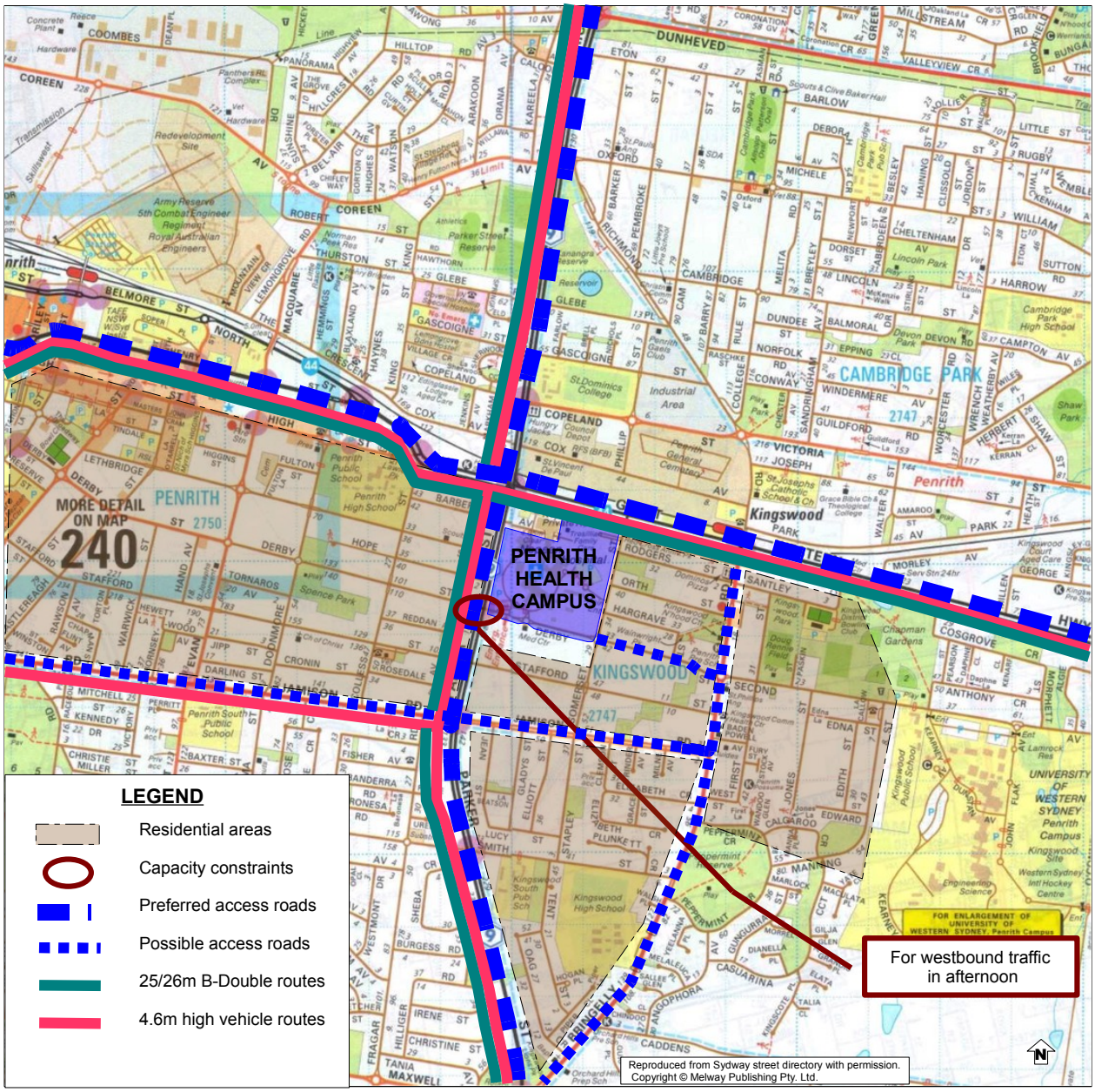


Figure 17. Road network constraints

Intersection capacity constraints

Known issues

- The intersection of Parker Street and Derby Street experiences capacity and queuing problems (eastern approach) in the afternoon. It is recommended that this intersection be not used for exiting construction traffic between 12:00 noon and 7:00 pm.
- The roundabout at the Derby Street / Main Hospital Entry intersection is affected by queuing from the Parker Street / Derby Street intersection in the afternoon. It is recommended that this access point be not used for exiting construction traffic between 12:00 noon and 7:00 pm.

Potential issues to be investigated in the course of preparation of specific TCPs

- Great Western Highway /Parker St,
- Derby St / Somerset St,

	• Derby St / Main Hospital Entry roundabout, • other intersections where high intensity construction traffic is planned.
Safety constraints	• High vehicles shall use only RTA approved routes, • TCPs shall have regard to the existing bike routes (refer to **Figure 12**). Drivers shall exercise extra caution when on these routes.

4.5.3 Site constraints

General requirements	• Minimise impact on
	  • existing hospital activities,
	  • operation of loading docks,
	  • pedestrian access,
	  • staff, visitor and patient vehicular access,
	  • residents of the surrounding area.

Existing car parking areas	On-site parking areas are shown in **Figure 2**. On-street parking opportunities are shown in **Figure 4**.
Internal road dimensional constraints	Refer to **Figure 6.**
Parking restrictions	Parking restrictions (No Stopping/No Parking) required for emergency vehicle access are to be maintained and protected or relocated. Relocation shall be done only in consultation with the Project Director. For location of these restrictions refer to **Figure 18**.
Pedestrian access points and links	To be maintained and protected or relocated. Relocation shall be done only in consultation with the Project Director. For main links and access points refer to **Figure 18**.

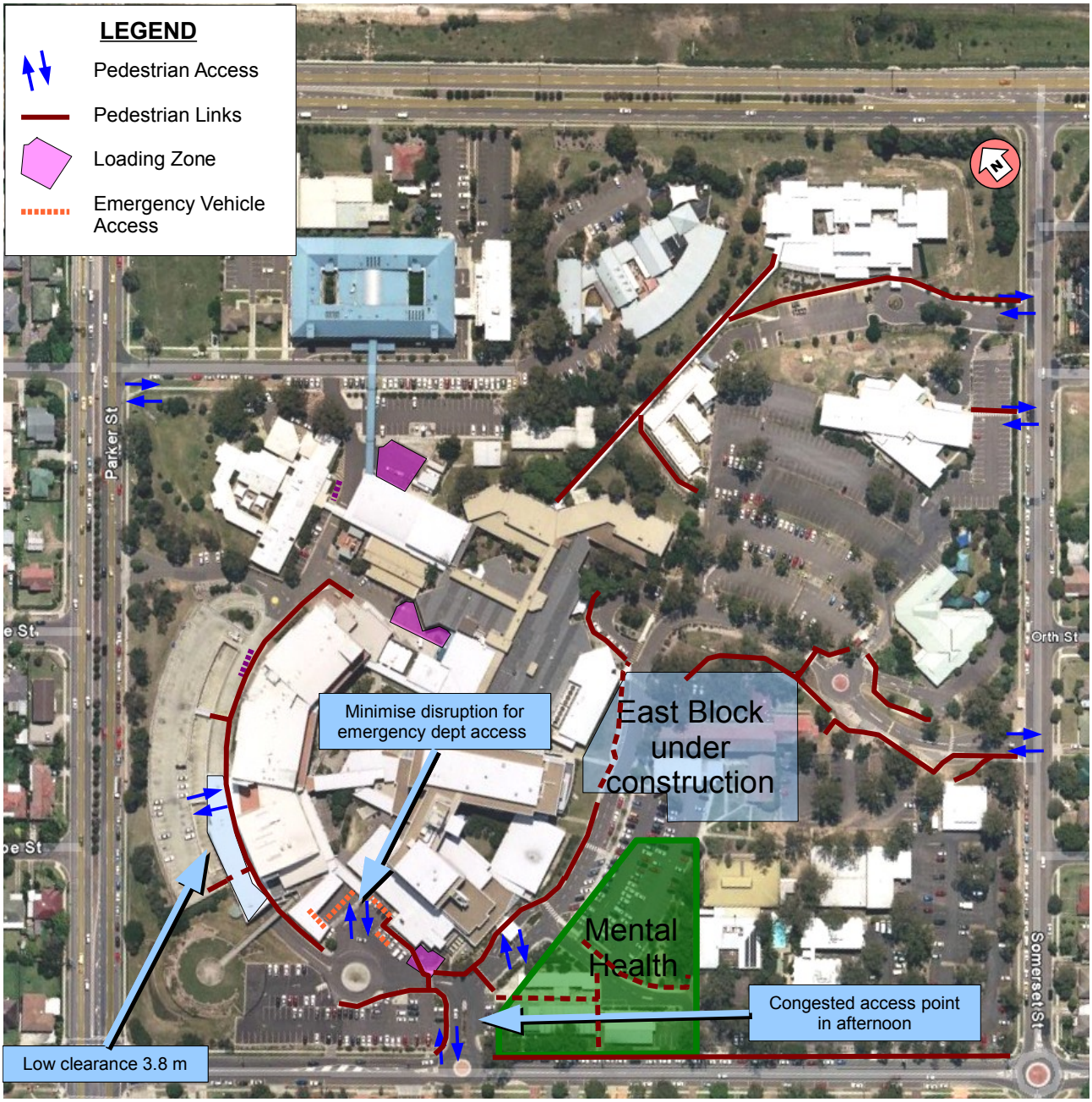


Figure 18. Site constraints.

4.5.4 Recommended truck routes

Basis for recommendations	• road network and site constraints, • proposed staging of works, • proposed location of works.
Status of recommendations	Preliminary due to incompleteness of detailed information about proposed works. To be reviewed in the course of preparation of specific TCPs.

Recommended routes	Refer to **Figure** 19.
Recommended construction site access points	• from Derby Street through a new driveway crossing to the new car park replacing existing car park 6 (refer to **Figures 2** and **19**) • From internal link road between the East Block and the Mental Health building

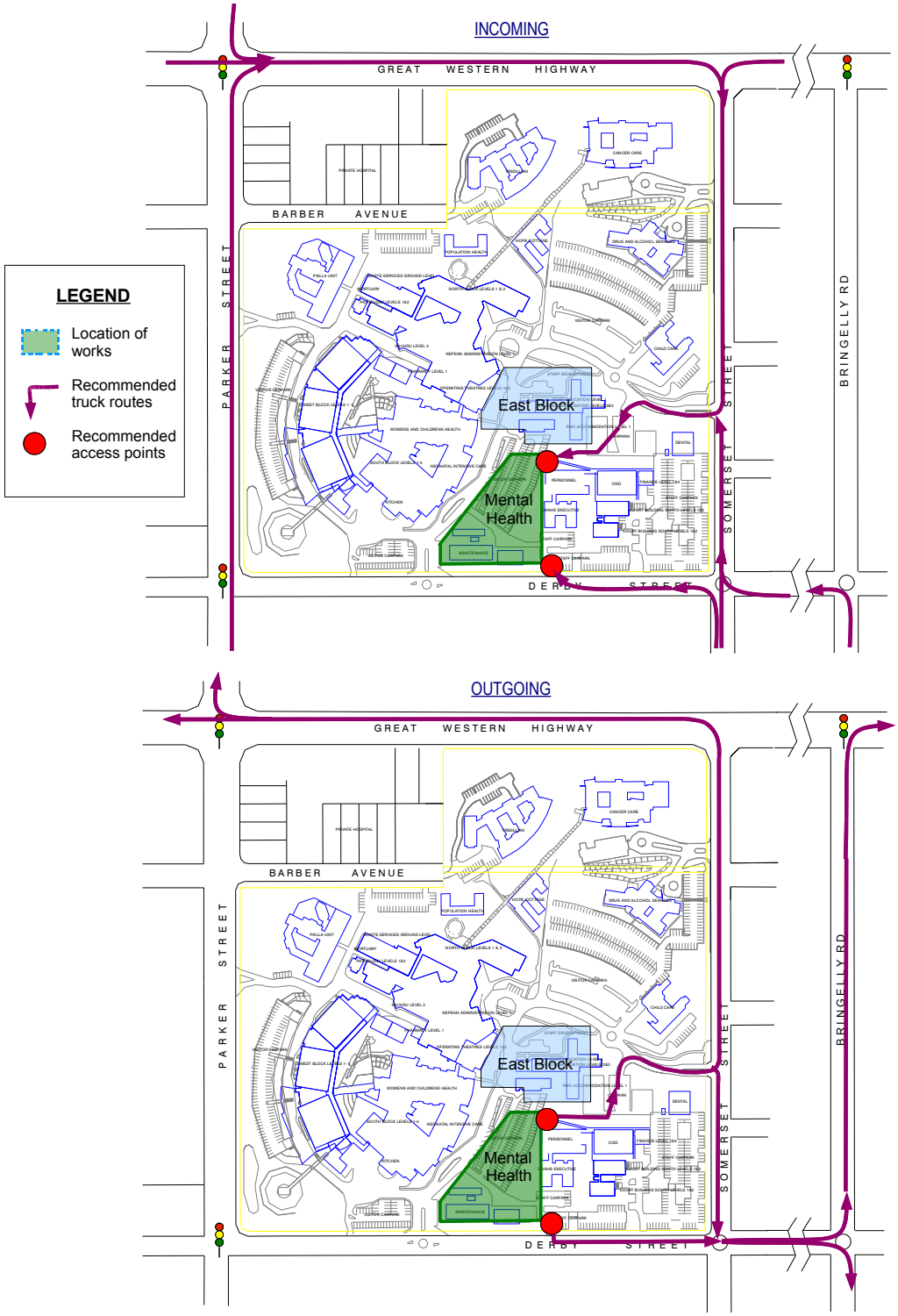


Figure 19. Recommended truck routes – construction of Mental Health building.

4.5.5 Likely impacts of construction traffic

Basis for risk assessment	• Current construction activities for a similar development on PHC site - construction of the East Block
	  • The current works are carried out based on Traffic Management Plan approved by the Authorities
	  • Construction vehicle access and movements are successfully managed
	  • Disruption to the existing PHC operations is minimal
	  • No negative impact on the operation of the surrounding road network

Risk of negative impacts on traffic and parking	• Low • It is expected that the impacts of the MH construction activities will be similar to those of the East Block construction as described above

4.5.6 General requirements for Traffic Control Plans

All TCPs shall comply with the provisions of	• Australian Standard 1742.3-2002 Manual of uniform traffic control devices - Traffic control devices for works on roads, • RTA Manual "Traffic control at work sites" (TCWS), • RTA Road Design Guide, • RTA Specification G10 – Control of Traffic, • RTA Road Safety Audit Guide, • RTA Interim Guide to Signs & Markings, • RTA Regulatory Signs Guide, • RTA Road Occupancy Manual, • AUSTROADS Road Safety Audit Guide, • AUSTROADS Guide to Traffic Engineering Practice, Parts 1 to 15, (as required), • Australian Standard AS1742 Manual of uniform traffic control devices, Parts 1, 2 and 4 to 14, (as required), • Australian / New Zealand Standard – AS/NZS3845 Road Safety Barriers Systems.
Qualifications	All TCPs are to be prepared by qualified person only. Suitable qualifications: • an engineering degree in traffic engineering or related discipline; or • an RTA certificate at an appropriate level.
Time periods of construction traffic	Shall generally be restricted to non-peak periods, reducing the potential for interaction with general traffic and pedestrians.

Provision for existing users	• Ensure that appropriate guidance is provided to staff and visitors of PHC wherever there is a change of their existing access or circulation, • Ensure that all road users are considered, including construction workers, motorists, cyclists and pedestrians.
Signposting and linemarking	• All signs, devices and linemarking shall be standard to ensure consistency and clarity for road users, • Proposed changes will be identified by advice to HI, Executive User Group and Area Health Service Facility Management, and Disruption Notice submission. On approval, significant changes will be advised to staff . • There shall be no conflicting messages between existing and temporary signs.
Parking for construction staff	Only limited spaces will be located on site. Proposed parking locations on streets, if required, shall be part of the TCPs, determined in consultation with Council.
Information	Road users and local communities shall be informed in relation to changed traffic conditions, through the Project Communication Plan.
Policies in addition to traffic management and control	All construction personnel, including contractors, will be made aware of • OH&S Policy, • Environmental Policy, • Quality Policy, • Drug and Alcohol Policy; and • other policies as required by HI. All construction personnel will be required to comply with the Site Access Procedure, including Area Health Service Contractors Safety Handbook.
Approvals	Contractors shall obtain the necessary approvals from Council and RTA for all works within the road reserve and/or any changes to existing infrastructure, installation and/or changes of any regulatory traffic control device.
Public transport	TCPs shall consider existing public transport routes • to minimise their disruption, • to promote use by construction staff
Access to properties	• maintain existing property access points, • maintain access to community facilities.
Temporary access points and associated tracks	Shall be • designed in accordance with RTA guidelines, • accommodate the largest vehicles servicing the property, • positioned at a location that has safe intersection sight distance, • constructed of an all weather surface with appropriate drainage; and • provide the minimum inconvenience to the users. Where necessary, entrance gates

	and boundary fences shall be adjusted to suit the temporary access tracks.
Active work areas	Shall be isolated from hospital and general vehicular and pedestrian traffic by either • provision of sufficient clearance from work areas, or • provision of safety barriers and/or fences, • if provision for queuing on site is not available or sufficient, delivery truck drivers or dispatchers shall notify the site before trucks leave their depot and again on approaching the site to minimise waiting times, • identify queuing locations if not solely on site in consultation with Council.
Traffic control devices	Shall be • installed in accordance with warrants and relevant guidelines, • regularly maintained, • controlled by appropriately trained traffic control staff.
Unplanned incident management – road network	• inform RTA Traffic Management Centre (TMC), Police and emergency services as required, • if resources are available, provide initial response to unplanned incidents with the aim to make the incident scene safe, and prevent further harm to persons or property, • provide support to emergency services, including traffic control in the vicinity of the incident, • during major incidents, provide a senior construction representative on-site to liaise with the RTA and emergency service agencies; and • reschedule planned works that will interfere with the incident, or create additional delays to those road users already affected by the incident.
Unplanned incident management – on PHC site	Develop an Incident Management Plan which will incorporate standard operating procedures for managing construction site unplanned incidents and emergencies. This Plan may include • roles and responsibilities of Contractor's and PHC staff in the event of incident and emergencies, • emergency response procedures dealing with different category of emergency arising from construction, traffic, environmental incidents, • identification of available response resources, • control, coordination and liaison arrangements with the RTA and emergency services.
Inspections	Carry out regular inspections of temporary traffic controls, as per requirements of RTA TCWS and AS 1742.3, including • pre-start and pre-close down inspections of short-term traffic control, • weekly inspections of long-term traffic control, • night inspections of long-term traffic control.

Service Provider responsibilities	• advise and obtain TCP approvals from Penrith City Council and/or RTA as required, • implement TCPs and procedures for the whole construction duration, • communicate TCP information to subcontractors and people working on the site, • ensure subcontractors' compliance with TCP requirements, • keep TCP records as required by the approving Authority, • incident management, • identify any other road or street work sites which may impact on TCP implementation, • arrange additional site TCPs as necessary.

4.6 Servicing requirements

Additional servicing requirements	Stage 3 redevelopment will not result in an increase in servicing needs which would require additional vehicular trips. The likely increases in waste generation and supply of food, linen and medical items will be accommodated within the current centralised services. There will be slight increases of vehicle loads, however the number of servicing vehicular trips will remain the same as at present. Waste collection will be carried out by special purpose vehicles already used on the PHC site. These vehicles are similar to those that collect shopping trolleys in some supermarkets. Their dimensional and manoeuvring characteristics may be compared to those of a typical 4WD vehicle with a number of trailers. Waste collection bins will be loaded onto trailers once daily and transported to the existing main waste collection area. The location of the loading area at the rear of the MH building for these vehicles is satisfactory.
Effect of internal road design changes	The proposed internal road realignment will not affect the existing routes utilised by delivery vehicles.

5 CONCLUSIONS AND RECOMMENDATIONS

Proposal	New and upgraded existing facilities resulting in • additional 31 beds • additional 51 staff (during the busiest shift)
Car parking requirements	A total of 779 car parking spaces in accordance with Council's DCP, for the whole of PHC after Stage 3A MH
Proposed car parking provision	1,274 off-street car parking spaces for the whole of PHC after Stage 3A MH
Compliance with Council's DCP	Complies
Parking impacts	Additional approximately 130 cars in the surrounding streets which have existing capacity of at least 100 spaces during the peak demand within close vicinity of the site. It is expected that the actual parking demand will reduce over the time due to the proposed measures to encourage the use of modes of transport other than the private car.
Traffic impacts	Additional traffic generated as a result of Stage 3A MH redevelopment will not affect the operation of the street network.
Impact of construction activities	Construction traffic movements will be manageable and will have no negative impact on the road network operation. •
Conclusion	The proposal is supported on traffic and parking grounds.
Recommendations	• Improvements to bus stops. • Wayfinding and signage improvements. • Introduction of a Transport Access Guide. • An improved employee induction program to include the one off issue of a free weekly train/bus pass.

6 REFERENCES

- NSW Department of Planning (2005) City of Cities: a Plan for Sydney's Future
- NSW Government (2010) Metropolitan Transport Plan – Connecting the City of Cities
- NSW Government (2004) Planning guidelines for walking and cycling
- Penrith Development Control Plan 2006. Part 2 Section 2.11 Car Parking.
- Cardno Eppell Olsen, Geoplan and AQ Planning (2008) Penrith Integrated Transport and Land Use Strategy (PITLUS) Draft Strategy Report.
- RTA (2002). Guide to traffic generating developments: Issue 2. RTA, Sydney, NSW.
- Australian/New Zealand Standard 2890.1:2004 Off-street car parking.
- Australian Standard 2890.2-2002 Parking facilities. Part 2: Off-street commercial vehicle facilities
- GTA Consultants (2007) Nepean Public Hospital Traffic and Parking Study
- Colston Budd Hunt and Kafes (January 2010) Traffic report for Nepean Hospital redevelopment: Mental Health Services, Oral Health Unit and car parking
- SCAPE (May 2010) Penrith Health Campus - Transport and Parking Needs Review - Update (Stages 3 and 3A)
- SCAPE (July 2010) Nepean Hospital Wayfinding and Signage Strategy

Appendix A

Questionnaire forms

TRAFFIC AND PARKING SURVEY

A study of existing parking patterns of staff, patients and visitors associated with Nepean Hospital is being completed to adequately plan and design future parking facilities. It is very important that you complete this questionnaire no later than **Wednesday 23 April 2008** and return it to your line manager / nurse unit manager.

Please fill in the appropriate circles completely (HB pencil is preferred option)

Example: correct ⬤ incorrect

Which classification best describes your status?

Doctor	○
Manager	○
Administrative Staff	○
VMO	○
SWAHS	○
Scientist	○
Pathology	○
Allied Health	○
Wardperson	○
Nursing	○
Engineering	○
Security	○
Volunteer	○
Student	○
Catering	○
Cleaning	○
Other (specify)	○

____

What time do you normally

if you work different shifts, please repy for this week's shift

start work		finish work	
5:00 - 7:00 am	○	11:00 am - 1:00 pm	○
7:00 - 9:00 am	○	1:00 - 3:00 pm	○
9:00 - 11:00 am	○	3:00 - 5:00 pm	○
11:00 am - 1:00 pm	○	5:00 - 7:00 pm	○
1:00 - 3:00 pm	○	7:00 - 9:00 pm	○
3:00 - 5:00 pm	○	9:00 - 11:00 pm	○
5:00 - 7:00 pm	○	11:00 pm - 1:00 am	○
7:00 - 9:00 pm	○	5:00 - 7:00 am	○
9:00 - 11:00 pm	○	7:00 - 9:00 am	○
11:00 pm - 1:00 am	○	9:00 - 11:00 am	○
Other (specify)	○	Other (specify)	○
______________		______________	

How do you normally travel to the Hospital?:

car driver	○
car passenger	○
dropped off	○
bicycle	○
train	○
walk	○
bus	○
Other (specify)	○

____

SEE NOTE BELOW

PLEASE REFER TO MAP OVERLEAF FOR QUESTIONS BELOW

If you are a CAR DRIVER, where do you normally park?

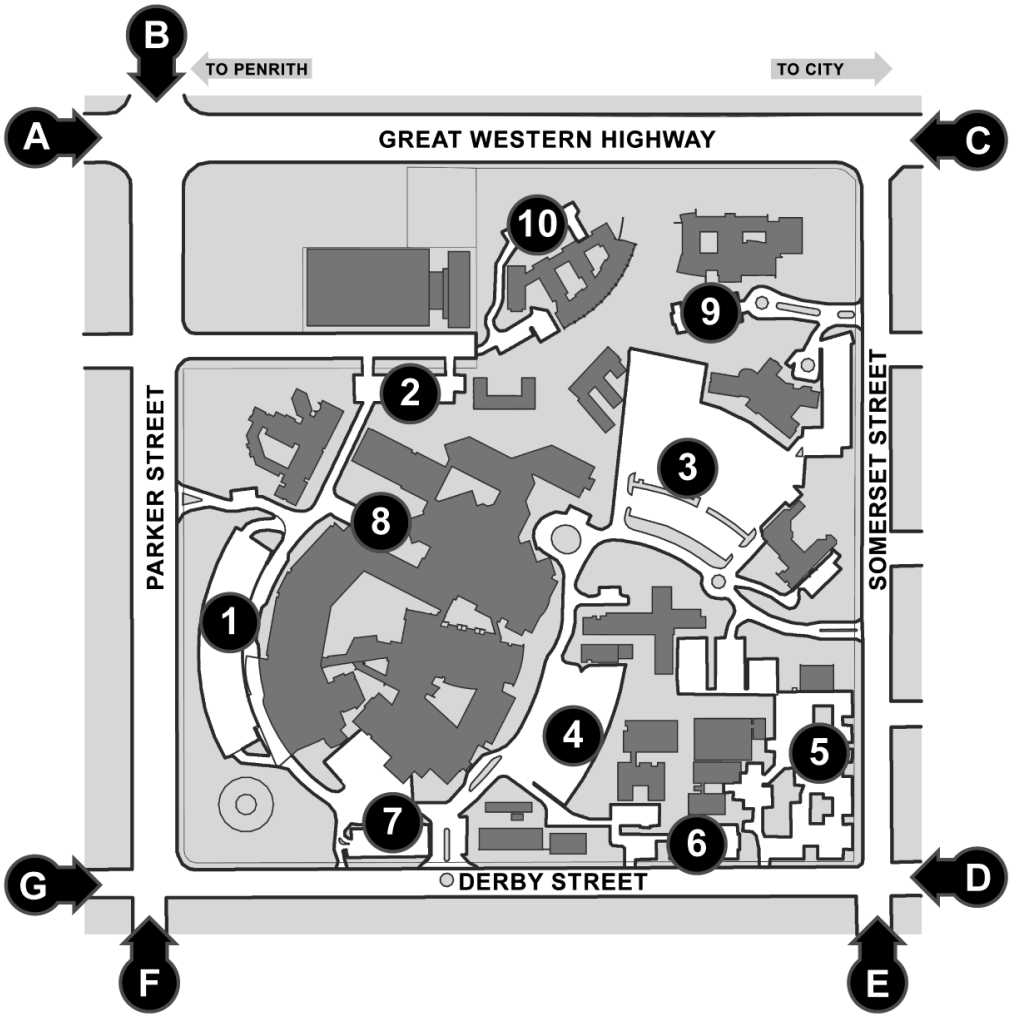
1	○
2	○
3	○
4	○
5	○
6	○
7	○
8	○
9	○
10	○
Derby Street	○
Somerset Street	○
Other (specify)	○

____

If you are a CAR DRIVER, which direction do you normally

COME FROM		GO TO	
A	○	A	○
B	○	B	○
C	○	C	○
D	○	D	○
E	○	E	○
F	○	F	○
G	○	G	○

Note: "Car passenger" means car is parked on site or near, "dropped off" means car leaves the site once you have been dropped off



Please indicate the suburb and its postcode where your trip originates _____

If you DO NOT normally DRIVE to the Hospital please indicate why

_____

_____

If you are a CAR DRIVER, and you prefer not to park on the Hospital site, please state your reasons

_____

_____

If you have any suggestions for parking provision or traffic management improvements, please indicate them below

_____

_____

_____

_____

Thank you very much for your assistance.

TRAFFIC AND PARKING SURVEY

We are conducting a survey of travel modes of patients and visitors and would appreciate it if you could answer a few questions. This will take you less than one minute.

Please fill in the appropriate circles completely (HB pencil is preferred option)

Example: **correct** ● **incorrect** ⊘ ✓ ⊖ ⊗

If you arrived together as one group, whether as visitors or a patient with accompanying persons, only one person needs to answer. If you arrived by car, the answeing person should be the driver

1. No. of people who arrived as one group

1 ○
2 ○
3 ○
4 ○
5 ○
6 ○
7 ○
8 ○
9 ○
10 ○

2. What is the purpose of your visit to the Hospital?

Ambulatory **patient** ○
Outpatient (e.g. medical clinic) ○
Day surgery **patient** ○
Allied health (e.g. physiotherapy) ○
Pathology ○
Visitor to a patient ○
Other (please specify) ○

_____

Building _____

WARD _____

3. Time of arrival

7:00 - 7:59 ○
8:00 - 8:59 ○
9:00 - 9:59 ○
10:00 - 10:59 ○
11:00 - 11:59 ○
12:00 - 12:59 ○
13:00 - 13:59 ○
14:00 - 14:59 ○
15:00 - 15:59 ○
16:00 - 16:59 ○
17:00 - 17:59 ○
18:00 - 18:59 ○
19:00 - 19:59 ○

4. How long do you think you will stay at the Hospital?

less than 30 min ○
30 min to 1 hr ○
1 hr to 2 hrs ○
2 hrs to 3 hrs ○
3 hrs to 4 hrs ○
more than 4 hrs ○

specify _____

5. What are your travel arrangements to / from the Hospital today?:

	IN		OUT
car driver	○		○
car passenger	○		○
dropped off / picked up	○	SEE NOTE BELOW	○
bicycle	○		○
train	○		○
bus	○		○
walk	○		○
Other (specify)	○		○

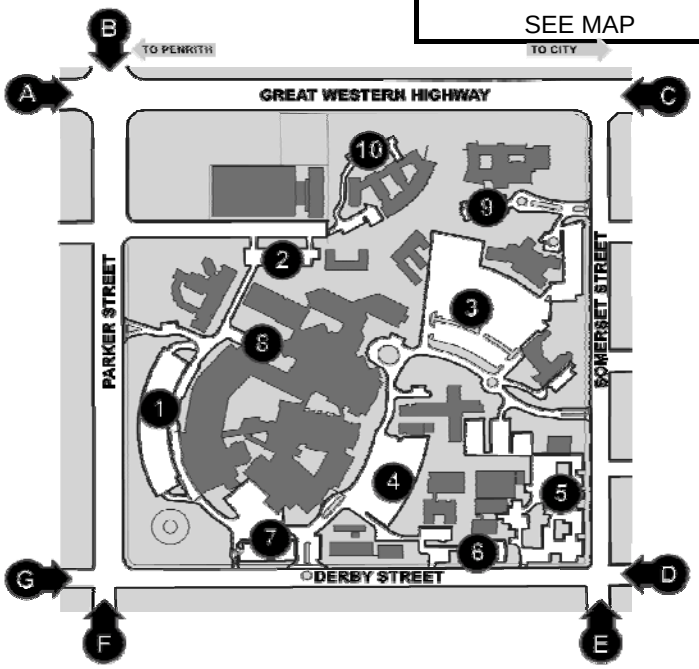
6. If you arrived by car, where did you park?

Hospital car park ○
On street outside the Hospital ○
Other ○
Specify _____

7. If you are a CAR DRIVER, which direction

HAVE YOU COME FROM		WILL YOU GO TO	
A	○	A	○
B	○	B	○
C	○	C	○
D	○	D	○
E	○	E	○
F	○	F	○
G	○	G	○

SEE MAP

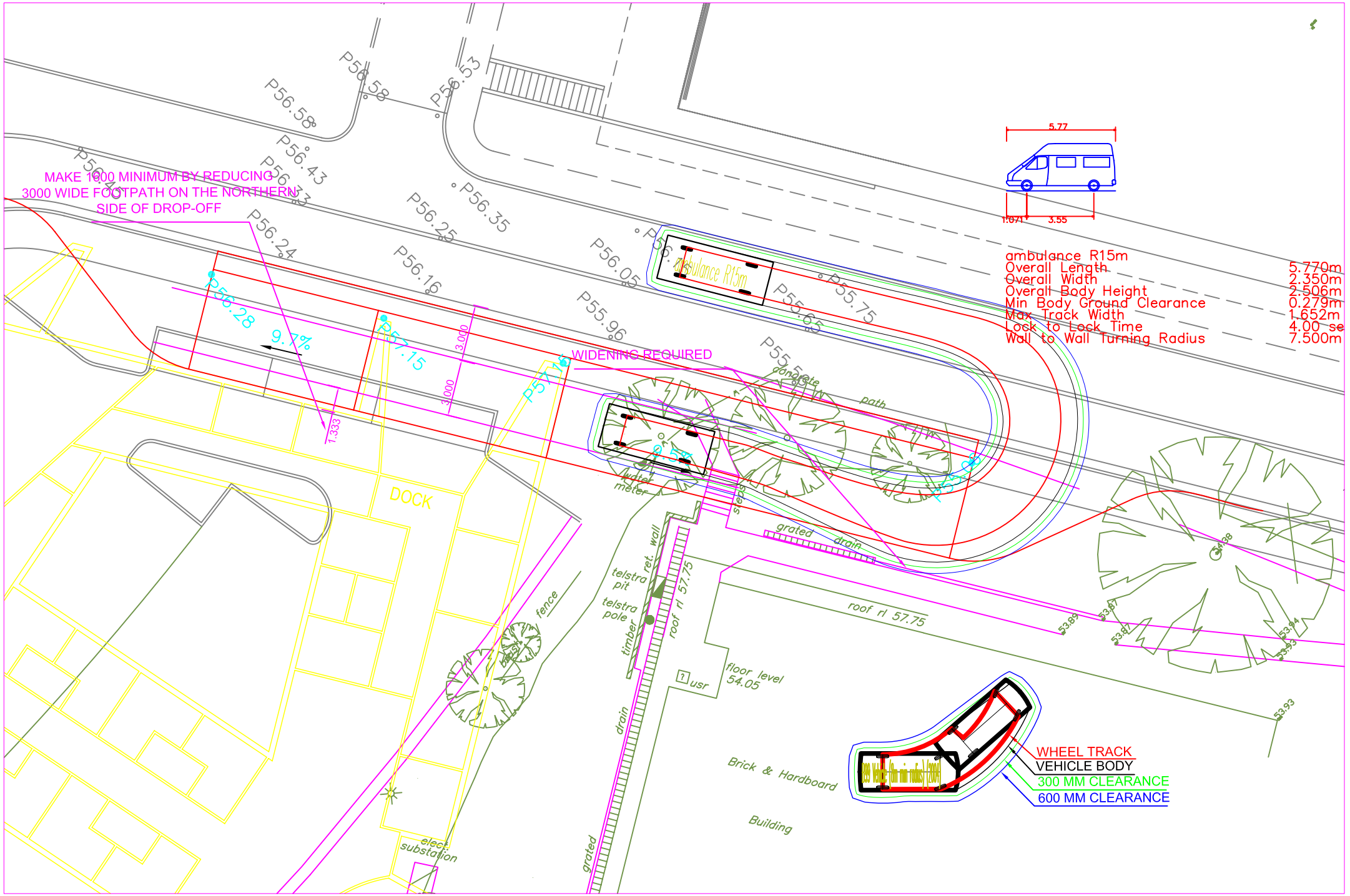


Note: **"Car passenger"** means car is parked on site or near, **"dropped off / picked up"** means car leaves the site once you have been dropped off and/or comes back to pick you up

If you have any questions, please direct them to Mr Oleg Sannikov, TEF Consulting, on 02 93322024 or 0414 978 067

Appendix B

Vehicle manoeuvring diagrams and design recommendations


MAKE 1000 MINIMUM BY REDUCING 3000 WIDE FOOTPATH ON THE NORTHERN SIDE OF DROP-OFF
WIDENING REQUIRED
DOCK
ambulance R15m
Overall Length 5.770m
Overall Width 2.350m
Overall Body Height 2.506m
Min Body Ground Clearance 0.279m
Max Track Width 1.652m
Lock to Lock Time 4.00 se
Wall to Wall Turning Radius 7.500m
WHEEL TRACK
VEHICLE BODY
300 MM CLEARANCE
600 MM CLEARANCE
Brick & Hardboard
Building
roof rl 57.75
floor level 54.05
grated drain
concrete path
ret. wall
telstra pit
telstra pole
timber
fence
elec. substation
water meter
steps
9.7%