

APPENDIX 5

TRAFFIC AND ACCESS

University of Western Sydney
**Initiating Planning Proposal for
UWS Westmead Campus
Redevelopment**

**Preliminary Traffic and Access
Report**

222470

Rev A | 21 December 2011

Arup
Arup Pty Ltd ABN 18 000 966 165

Arup
Level 10
201 Kent Street
Sydney
NSW 2000
Australia
arup.com.au



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1 Introduction

The University of Western Sydney (UWS) Westmead site extends over 4 hectares of land located adjacent to the Westmead Railway Station (refer to Figure 1). The site is partly used by the University with portions of the site leased to external parties.

The site has the potential to be a premier Transit Oriented Development, as well as adding value to the broader community by embellishing the town centre and enhancing access to public transport and services as part of the Westmead Precinct Structural Plan.

The site is currently zoned B2 Special Uses Educational Establishment under Parramatta Local Environmental Plan 2011. UWS is seeking to rezone the site to B4 Mixed Use and position the site as a commercially viable, outstanding and sustainably designed mixed use development. UWS intend to retain a presence on the site through UWS College.

This preliminary technical report is an appendix to the initiating Planning Proposal (Cityplan Services, December 2011). This report summarises preliminary investigations of the following:

- site access and internal road network
- parking rates
- public transport
- walking and cycling
- target mode split
- traffic generation and traffic impacts

More detailed analysis, including traffic modelling, will be undertaken at subsequent stages of the planning process.

This is a detailed street map of Westmead, New South Wales, Australia. The map shows a network of roads including the M4, M5, and various local streets like Darcy Rd, Westmead Rd, and the Sydney Motorway. Key landmarks include the Westmead Hospital, Marsden Centre, The Childrens Hospital at Westmead, and the Parramatta Regional Park. The map also shows the surrounding areas of Parramatta, Northmead, and Westmead. A scale bar indicates 25.1 km.

2 Existing Transport and Accessibility Situation

2.1 Existing Site

Most of the buildings on the site are currently utilised by the University of Western Sydney as part of UWS College. A small number of other tenants use buildings for a variety of courses. Current staff numbers are approximately 40 with up to 300 students at any one time.

The site includes an on-grade car park for use by the general public. The car park has capacity for approximately 220 cars and it appears that most utilisation is by Westmead Hospital staff and visitors. The car park has no time restriction with a graduated scale of parking charges up to a maximum of \$12 for between 2 - 24 hours.

Vehicular access to the site is currently from Hawkesbury Road only with no access from Darcy Road. The primary pedestrian access is from Hawkesbury Road with a secondary access via steps from Darcy Road at the north-western corner of the site. A gated pedestrian access also exists between the site and the adjacent high schools.

RailCorp has an existing arrangement for vehicular access through the site to a gate to the railway line at the south-western corner of the site. It is expected that this will need to be retained in any site redevelopment.

2.2 Public Transport

Westmead Station is a high order station on the CityRail network. Most Blue Mountains, Western Line and Richmond Line services stop at the station permitting fast trips from Westmead to Sydney CBD, Penrith, Blacktown, Richmond etc. An at-grade signalised crossing of Hawkesbury Road at Railway Parade provides efficient and safe access to the station.

The Cumberland Line links Campbelltown to Blacktown. The line only operates on weekdays with two morning peak northbound services and three afternoon peak southbound services. Apart from these services such trips must involve a change of trains at Granville, Lidcombe or Strathfield.

Westmead Station has approximately 7,000 boardings on a typical weekday. Detailed analysis suggests that most people using the station are either residents of the local area or school/college students, including students at the UWS site. Relatively few workers travelling to the Westmead precinct appear to use Westmead station.

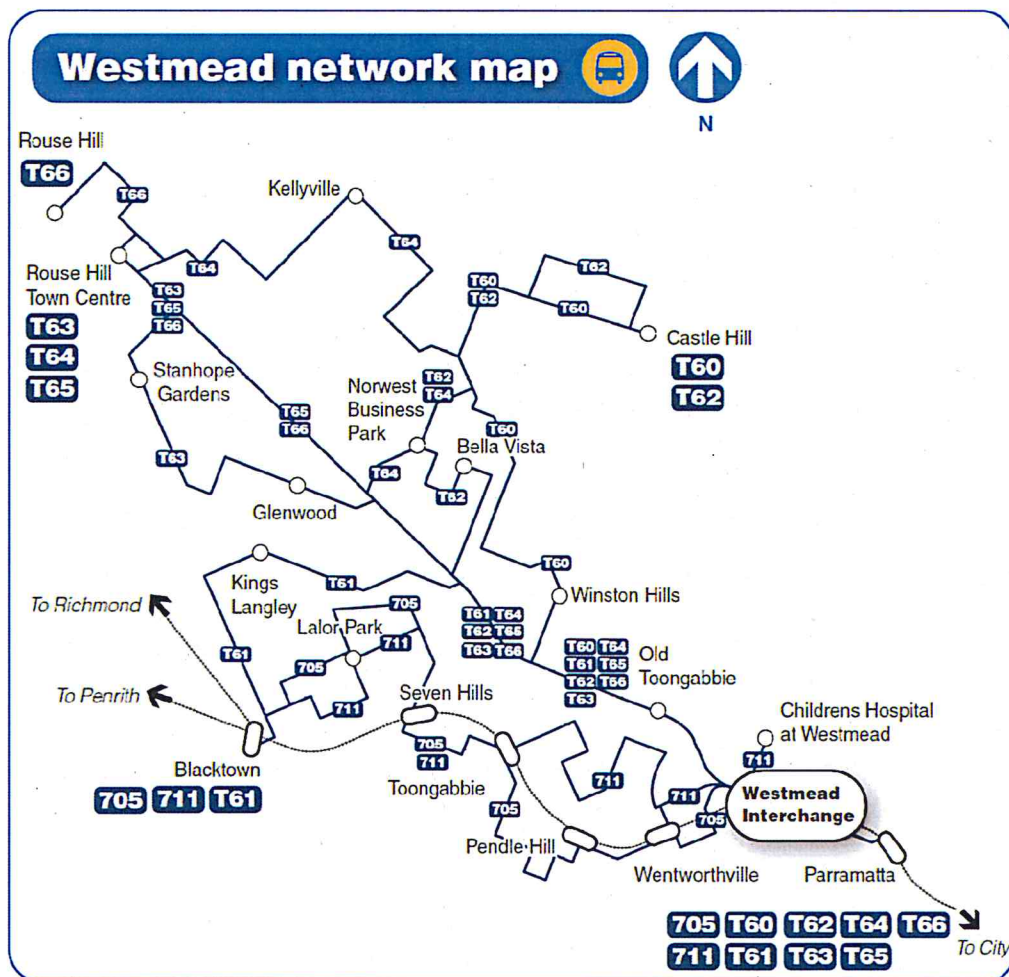
The Westmead area bus network map is shown on Figure 2. Westmead buses serve destinations such as Wentworthville, Seven Hills and Blacktown. None of the new regional Metrobuses serve Westmead.

Local bus services use the Westmead Interchange on the southern side of the railway station on Alexandra Ave. Stops are also located on nearby roads such as Hawkesbury Road and Darcy Road.

The site is located adjacent to the North West T-way that runs along Alexandra Ave – Hawkesbury Road – Darcy Road. Bus stops are located on Darcy Road near the site. The T-way connects Rouse Hill to Parramatta via Old Windsor Road with up to 4 minute headways at peak times.

The bus network map shows that whilst Westmead is well-served by buses to the northwest it is poorly served by buses to the north, south and east. Services from the east generally terminate at Parramatta without continuing to Westmead.

Figure 2 Westmead Area Bus Network Map



2.3 Walking and Cycling

A regional off-road cycling route is located on the eastern side of the T-way linking Parramatta to Rouse Hill. No other local cycling routes are proposed as part of the Parramatta Bike Plan 2009.

The Westmead area is generally served by good, wide footpaths with signalised crossings of main roads, including across Hawkesbury Road near the station. The railway and large lot sizes act as a barrier to the formation of a fine-grained

pedestrian network. Darcy Road is also very wide and can act as a barrier to pedestrian movement.

The site is within journey to work walking distance of all land uses in the Westmead Precinct and also Parramatta CBD.

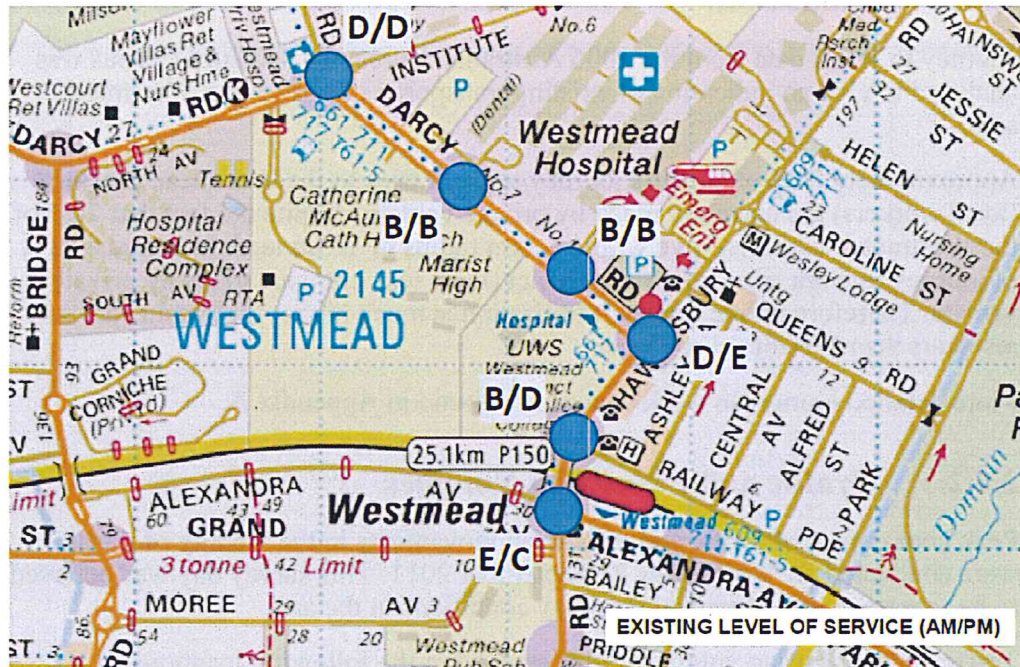
2.4 Road Network

The main local roads in the Westmead area are Hawkesbury Road and Darcy Road. Bus-only lanes and dedicated bus-only traffic signals provide for the T-way. The site is located some distance from the major metropolitan arterial roads, including M4 Motorway, Cumberland Highway, Great Western Highway and Old Windsor Road.

The location of the Westmead Precinct results in roads such as Hawkesbury Road and Darcy Road carrying little through traffic, except for traffic to Parramatta from nearby suburbs such as Wentworthville. Bridge connections across Toongabbie Creek (Redbank Road) and Parramatta River (Bridge Road) are in effect private roads for hospital staff only.

The limited number of approach/departure routes contributes to traffic concentrated on a small number of roads. Congestion occurs during peak periods on Hawkesbury Road yet Darcy Road adjacent to the site operates at a good level of service¹ at all times as shown in Figure 3.

Figure 3 Existing Road Network Level of Service



Note: Assessment is based on data described in Section 2.6.2

¹ Level of Service is an index of the operational performance of traffic on a given traffic lane, carriageway, road or intersection, based on service measures such as delay, degree of saturation, density and speed during a given flow period. It ranges from A – very good to F – very poor.

There is unlikely to be any significant change to the regional road network in the Westmead area in near future. Replacement of the existing Bridge Road overbridge on the railway line is proposed by RailCorp, possibly with the inclusion of an additional southbound lane. An additional northern leg to the Darcy Road / Bridge Road intersection will be provided to facilitate access to the new residential/retail development currently under construction.

2.5 Parking

There is considerable on-site parking in the Westmead Precinct, estimated to be in the order of 6,000 spaces. The majority of this parking is long term catering for hospital staff. Utilisation is very high, often with waiting lists, with a key contributing factor the low charge for this parking.

A small RailCorp commuter car park exists near the railway station on Railway Parade. This parking is free and unrestricted and fills up very early in the morning.

There is limited on-street parking and short term parking in the Westmead area. Resident parking schemes operate in both Parramatta and Holroyd LGAs. Most on-street parking on the southern side of the railway line, within Holroyd LGA, is time-restricted. The main exception is the northern side of Alexandra Ave, west of Hawkesbury Road, that is unrestricted and used by rail commuters.

2.6 Existing Transport Patterns

2.6.1 Mode Split

Journey to Work data from the 2006 Australian Bureau of Statistics Census was analysed to give an indication of existing transport patterns for the Westmead area.

Approximately 80% of existing journey to work trips to the Westmead precinct² (local workers) are currently made by private vehicle, despite the fact that 70% of the Westmead workforce live within a 7km radius of Westmead. In contrast 43% of journey to work trips from the precinct (local residents) are made by private vehicle. Therefore public transport utilisation is much higher for Westmead residents than Westmead workers.

More detailed journey to work data can be found in Appendix A.

2.6.2 Traffic and Pedestrian Volumes

Peak hour counts of traffic and pedestrian movements in the vicinity of the site were conducted on Wednesday 21 September 2011. This survey day was believed to be representative of typical weekday conditions in the area.

Traffic and pedestrian volumes were recorded at the following locations:

² The Westmead precinct includes UWS Westmead, Westmead Hospital, Westmead Private Hospital, Coca Cola, Catherine McCauley/Marist High Schools and some of the surrounding residential precincts both north and south of the railway line

- Hawkesbury Road / Alexandra Ave (signals)
- Hawkesbury Road / Railway Parade (signals)
- Hawkesbury Road / UWS Westmead Access
- Hawkesbury Road / Darcy Road (signals)
- Darcy Road / Westmead Hospital No.1 Access (signals)
- Darcy Road / Westmead Hospital No.7 Access (signals)
- Darcy Road / Mons Road (signals)

Traffic volumes at key locations are summarised in Table 1. It can be seen that AM peak volumes are generally higher than PM peak volumes

Table 1 Traffic Volumes at Key Locations

Location	Two-way Traffic Volume	
	8-9am	4-5pm
Hawkesbury Road between Railway Pde and Darcy Rd	1,820	1,440
Hawkesbury Road north of Darcy Rd	1,280	1,210
Darcy Road between Hawkesbury Rd and Westmead Hospital No.1 Access	1,200	990
Darcy Road between Mons Rd and Westmead Hospital No.7 Access	1,270	1,090
UWS site access on Hawkesbury Road	200	90

The busiest pedestrian crossings were found to be:

- western and eastern sides of Railway Parade across Hawkesbury Road
- western and eastern sides of Darcy Road across Hawkesbury Road

A detailed summary of the traffic and pedestrian count data can be found in Appendix B.

3 Traffic and Access Analysis

3.1 Indicative Land Use Mix

Traffic and access analysis contained in this report is based on the following indicative land use mix (Table 2). The 4,000m² for education/university essentially retains the current UWS usage on the site. Further information can be found in the Urban Design Analysis report.

Table 2 Indicative Land Use Mix

Land Use	GFA (m ²)
Residential	
Residential Apartments (including workers accommodation)	67,000
Residential Aged Care	6,000
Seniors Living	12,000
Non-Residential	
Commercial	13,000
Retail	8,000
Education/University	4,000
Child Care	1,000
Hotel / Café	10,000
Total	121,000

3.2 Site Access and Internal Road Network

The site has constrained vehicular access with only two street frontages. Vehicular access to the site is proposed at two locations.

The primary access would be on Darcy Road as shown on the Preliminary Concept Plan. The Darcy Road / Westmead Hospital no.1 Entrance intersection was reconstructed in 2007 to accommodate the T-way in the centre of Darcy Road. The RTA design plans for the signalised intersection, reproduced as Figure 4, show that it was designed to accommodate future access to a redeveloped UWS Westmead site.

The primary access would be in the form of a four-way signalised intersection with all movements permitted. The road level of Darcy Road is considerably lower than the existing site level. The Preliminary Concept Plan envisages re-grading of the site at this location to enable an acceptable road gradient for the new leg at this intersection.

It has been observed that the three-way intersection currently operates with spare capacity and therefore should have capacity to accommodate a reasonable level of site-generated traffic.

The secondary access would be on Hawkesbury Road at the existing driveway location. The access would be in the form of a left-in/left-out arrangement.

The site access points and car parking areas would be connected by an internal road network as shown on the on the Preliminary Concept Plan. The road to Darcy Road would be the major road and the road to Hawkesbury Road a minor road.

Access to the existing RailCorp gate at the south-western corner of the site would be retained.

Figure 4 Darcy Road / Westmead Hospital Entrance, Traffic Signal Plan

See following page

3.3 Parking

The proposed amendment to Parramatta LEP 2011 as part of the rezoning will be accompanied by a Development Control Plan (DCP) for the site. The DCP will include maximum parking rates for each type of land use.

For the purposes of this initiating Planning Proposal maximum parking rates have been based on the Parramatta City Centre Local Environment Plan 2007 as summarised in Table 3.

Table 3 Proposed Maximum Parking Rates

Land Use	Maximum Number of Parking Spaces
Child care	A maximum of 1 parking space to be provided for every 4 child care places
Commercial	A maximum of 1 parking space to be provided for every 100m ² of gross floor area
Education	As per existing
Hotel accommodation	A maximum of 1 parking space to be provided for every 5 hotel units plus 1 parking space to be provided for every 3 employees
Multi dwelling housing	A maximum of 1 parking space to be provided for every dwelling plus 1 parking space to be provided for every 5 dwellings for visitors.
Seniors housing	A maximum of 1 parking space to be provided for every 10 dwellings plus 1 parking space to be provided for every 10 dwellings for visitors
Shops	A maximum of 1 parking space to be provided for every 30m ² of gross floor area

Parking would be located in a number of discrete car parks usually situated below the built form above. All parking areas would be accessible from both the Hawkesbury Road and Darcy Road access points.

On the basis of the parking rates presented above, up to 1400 parking bays may be provided on-site. Further development of appropriate parking rates for the development will occur at a subsequent stage of the planning process. The rates will take into consideration the proximity to public transport, the mixed use nature of the development and the mode share targets.

3.4 Public Transport

Westmead is well-served by east-west rail services and bus services to the west and northwest. A deficiency exists in public transport provision to other areas. Development of the site would lead to an increase in public transport usage in the Westmead area and may contribute to the provision of better public transport services which is primarily the responsibility of the NSW Government.

Development of the site could be accompanied by two infrastructure items providing better access to public transport nodes:

- The opportunity to allow for an underpass is available underneath Hawkesbury Road to Westmead Railway Station. This would allow people to walk and cycle from the station to the site without the need to cross any busy roads.
- The opportunity to allow for a footbridge is available across Darcy Road, midway between the primary site access and Hawkesbury Road. This would provide direct access between the site and the Westmead Hospital precinct. It would also have direct access to the T-way bus stop and the off-road regional cycling route.

3.5 Walking and Cycling

New walking/cycling connections are proposed as part of the development as described in the preceding section. All existing signalised pedestrian crossings of Hawkesbury Road and Darcy Road would be retained.

Street frontages would be activated to provide a better walking environment. A fine-grained network of internal roads and paths would be provided within the site.

3.6 Target Mode Split

Parramatta City Council is currently developing a Westmead Precinct Planning Framework. A key element of this framework is³:

In order to ensure that the precinct can accommodate increased development a public transport modal share of 35% will need to be achieved. This will be supported by the provision of maximum parking rates. Accessibility can be enhanced by a number of transport, road and parking improvements, proposals include:

- i. Widening and upgrading of the bridge connecting Bridge Road to Alexandra Avenue.
- ii. Improvements at the intersections of Kleins and Redbank Roads with Briens Road.
- iii. Road connections from Redbank Road, through the rear of the hospital property to Mons Road and from Briens Road, in the vicinity of the Coca-Cola property to the rear of the hospital property.
- iv. The relocation of hospital and provision of overflow precinct parking to the rear of Westmead public hospital (i.e. 'back of house').
- v. Improvements to public transport including additional bus and train services.
- vi. Longer term strategic road improvements including the regional ring road.

Preliminary planning for the UWS Westmead site has been on the basis of achieving Council's public transport modal share of 35% in the weekday peak periods.

The indicative land use mix is likely to result in the site accommodating 2000 residents and 1400 workers⁴. On the basis of these numbers, Table 4 shows

³ Report to Parramatta City Council, Item Number 8.13, 28 November 2011

indicative mode splits required to achieve Council's public transport modal share targets. The table demonstrates that the relatively low parking rates will assist in achieving the desired level of public transport usage.

Table 4 Target Mode Split

Land Use	Target Mode Split	
	Non-Car	Car
Residential	57%	43%
Non-residential	30%	70%
Total	46%	54%

3.7 Traffic Generation and Traffic Impacts

Traffic generation forecasts are typically based on rates per m² of GFA development for each type of land use, and are usually derived from one of the following two sources:

- Standard rates contained in the RTA's *Guide to Traffic Generating Developments*; or
- Rates estimated on the basis of surveys of existing developments similar to the proposed development.

The RTA Guide's standard trip rates are generally based on situations with unrestrained parking. However, as stated in Section 3.3 management of the amount of on-site parking will be a key component of the planning principles for the site. Therefore, traffic generation forecasts can be based on rates lower than those contained in the RTA Guide.

A preliminary estimate of forecast traffic generation, based on the indicative land use (Table 2) and the proposed parking rates (Table 3), is summarised in Table 5.

Table 5 Forecast Traffic Generation

Land Use	Forecast Traffic Generation (vehicles per hour)	
	AM Peak Hour	PM Peak Hour
Residential	310	310
Non-residential	340	690
Total	650	1,000

On the basis of the indicative land use mix and parking rates contained in this report, it is anticipated that the development could generate up to 650 vehicle trips

⁴ Note that not all of these residents and workers will be on-site simultaneously, nor will they all be travelling in the peak periods

in the weekday AM peak hour and up to 1,000 vehicle trips in the weekday PM peak hour. The higher PM peak generation is due to the retail component of the indicative land use mix with retail developments generating low traffic volumes in the AM peak. The actual traffic generation, however, may vary from these figures due to changes to the land use mix and other factors.

Traffic modelling of the impact of site-generated traffic will occur at a subsequent stage of the planning process.

3.8 Overall Transport Objectives

The site has the potential to be a premier Transit Oriented Development due to its proximity to existing public transport infrastructure. The overarching aims of the site from a transport perspective would include:

- Reducing car dependency by managing the amount of on-site parking provided;
- Acting as a catalyst for the provision of better public transport services to the Westmead area;
- Increasing the proportion of trips made to and from the Westmead Precinct by non-car modes; and
- Improving pedestrian and cycling links in the broader Westmead Precinct.

4 Conclusions

This report describes the existing situation, Preliminary Concept Plan proposal and proposed transport access scheme for the rezoning of the UWS Westmead site. It provides preliminary assessment of site access and internal road network, maximum parking rates, public transport, walking and cycling. Target mode splits are proposed to meet Parramatta City Council's public transport modal share targets for the Westmead precinct.

More detailed assessment, including traffic generation forecasts and traffic modelling of the impact of site-generated traffic, would occur at a subsequent stage of the planning process. Subject to this detailed traffic analysis, the site could be considered appropriate for mixed use development.

Appendix A

Journey to Work Data Analysis

Subject UWS Westmead Transport - Mode Split Analysis

Date 21 December 2011

Job No/Ref

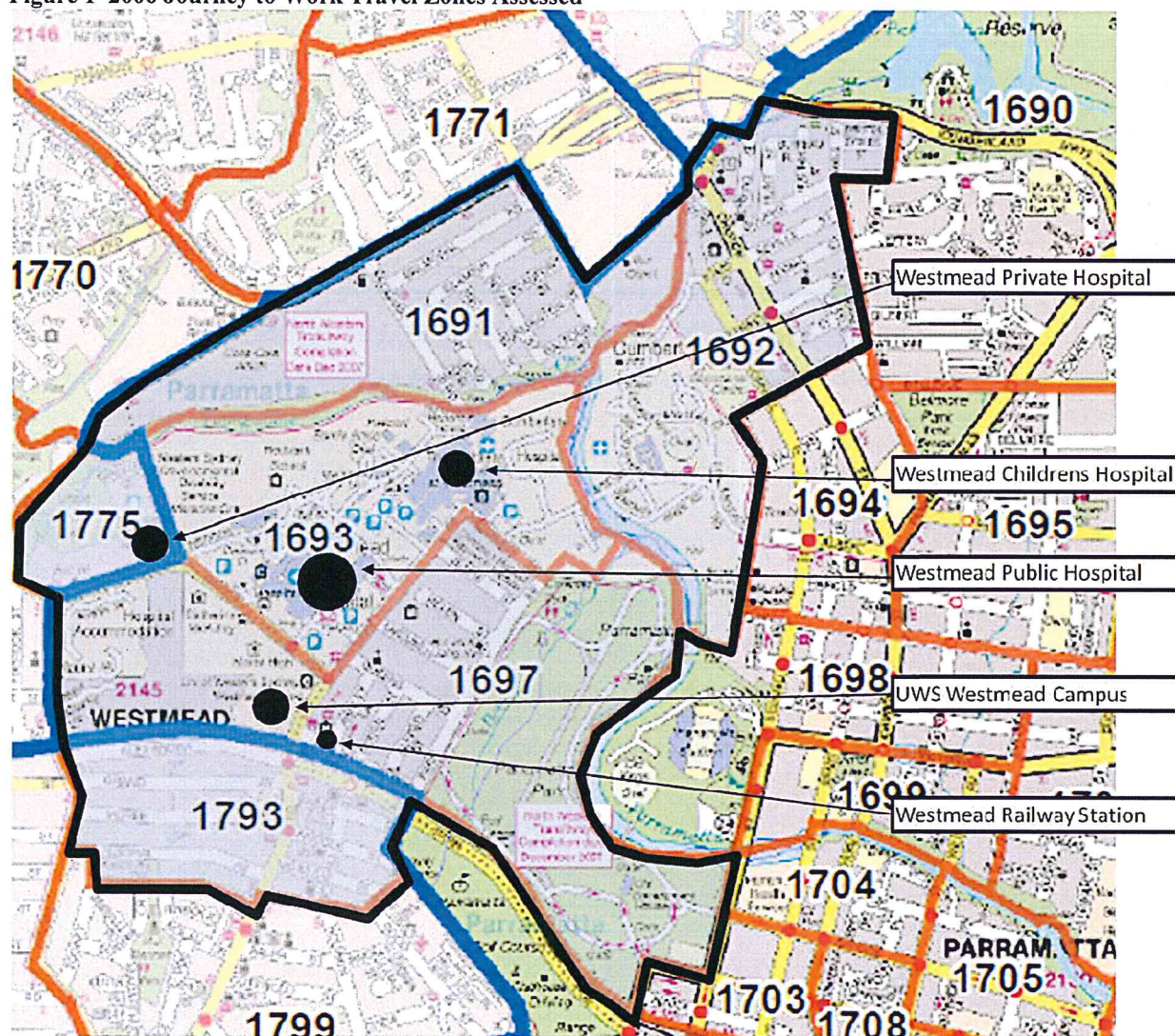
222470/JDM

This document summarises the existing mode share of journey to work trips both originating from, and arriving to, the Westmead precinct. This analysis is based on Journey to Work data from the 2006 Australian Bureau of Statistics Census. The areas assessed, both as origin and destination zones, include:

- UWS Westmead (part of zone 1697)
- Westmead Hospital
- Catherine McCauley/Marist High Schools
- Surrounding residential precincts

An indication of the travel zones assessed is shown in Figure 1 below.

Figure 1 2006 Journey to Work Travel Zones Assessed



A mode share summary of Journey to Work trips originating from, and arriving to, the Westmead precinct is presented in Table 1 and Table 2 respectively.

Table 1 Journey to Work Mode Share Summary – Trips Originating in Westmead

Mode Description	Proportion of trips from Travel Zone					
	1692	1693	1697	1793	1775	Combined Westmead Precinct
Train	8%	<i>No trips originating from travel zone</i>	33%	37%	16%	32%
Bus	4%		1%	0%	0%	1%
Car Driver	69%		36%	42%	69%	40%
Car Passenger	2%		3%	3%	3%	3%
Walk	9%		19%	8%	4%	15%
Other modes*	8%		7%	10%	7%	8%
Total	100%		100%	100%	100%	100%
Total Trips from Travel Zone	144	0	1,970	689	94	2,897

Table 2 Journey to Work Mode Share Summary – Trips Arriving to Westmead

Mode Description	Proportion of trips to Travel Zone					
	1692	1693	1697	1793	1775	Combined Westmead Precinct
Train	4%	10%	18%	16%	8%	11%
Bus	3%	1%	3%	0%	1%	2%
Car Driver	81%	77%	65%	72%	81%	75%
Car Passenger	7%	5%	8%	7%	7%	6%
Walk	3%	6%	5%	4%	3%	5%
Other modes*	3%	1%	1%	1%	1%	1%
Total	100%	100%	100%	100%	100%	100%
Total Trips to Travel Zone	1,121	7,415	2,029	217	496	11,278

* Other modes include bicycle, truck, motorbike and taxi

Appendix B

Traffic and Pedestrian Count Data

