Concept Plan - University of Technology, Sydney Transport Management and Accessibility Plan (TMAP) Report

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UTS Sydney

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Contents

1 Introduction

This report has been prepared on behalf of the University of Technology, Sydney to address the Department of Planning's Director General's Key Assessment Requirement in relation to the proposed Concept Plan – University of Technology Sydney (UTS) Broadway.

These requirements stated:

Transport Management and Accessibility Plan (TMAP) for the entire site, in accordance with the Ministry of Transport's Interim TMAP Guidelines, also including:

- Staging/ Sequencing Plan;
- Construction Management Plan; and
- Voluntary Planning Agreement addressing MoT's requirements.'

This report develops a TMAP for the proposed development of the site. The TMAP is in addition to:

- Traffic Study (refer to 'Concept Plan – University of Technology Sydney (UTS) Broadway – Traffic Report' (HalcrowMWT January 2009)

This TMAP was prepared in conformance with the objects of the *Interim TMAP Guidelines* (2001).

The site for which the Concept Plan was prepared is described in this report as the Broadway Precinct.

The structure of this report is:

- Current onsite activities and transport patterns are described in Chapter 2, which sets out to identify the salient features of the site which affect transport;
- Chapter 3 describes the strategic context in which the site sits, with reference to evolving plans of the State Government and the ongoing theme of population growth within the broader Sydney region;
- The proposed development of the site is described in Chapter 4;
- Chapter 5 provides estimates of future student travel behaviour along with its resultant transport demand;

- Chapter 6 draws together the foregoing description and analysis to identify the implications of the proposed development for transport services;
- Conclusions and recommendations are presented in Chapter 7.

2 Background Situation

2.1 *Site Location and Land Use*

The University of Technology Sydney City Campus includes two precincts, namely the Broadway Precinct and Haymarket Precinct, and comprises a number of buildings within the lands bounded by Quay Street in the east, Hay Street / Ultimo Road / Thomas Street in the north, Wattle Street in the west and Broadway in the south.

The proposed UTS Concept Plan is for the redevelopment of land holdings within the 'Broadway Precinct'. These lands consist of the area made up of a building on the east side of Harris Street between Harris Street and the Ultimo Pedestrian Network, and buildings between Harris Street, Thomas Street, Jones Street and Broadway and, between Jones Street, Thomas Street, Wattle Street and Broadway. The lands to which this apply and roads in the vicinity of the precinct are shown in **Figure 1**.

2.2 *Road Network*

Broadway – which runs along the southern boundary of the Broadway precinct, is a wide, heavily trafficked road which forms a pedestrian barrier to areas to the south. Most intersections are controlled by traffic signals which provide pedestrian crossing facilities. There are kerbside designated bus lanes in each direction.

Harris Street - runs north – south along the eastern edge of the Broadway Precinct. From Thomas Street to Broadway, this street has four to five lanes wide running one-way southbound. The university provides a pedestrian overbridge over Harris Street between Building 1 Tower block and the Building 6 block adjacent to the Australian Broadcasting Corporation (ABC) building.

Wattle Street - is a one-way street running northbound past the site and forms the western boundary of the Broadway Precinct. It consists of three travel lanes and parallel parking lanes on both sides of the street north of Thomas Street. The intersection of Wattle Street and Thomas Street is priority controlled.

Thomas Street - is a local street connecting Wattle Street in the west with Harris Street in the east. It forms the northern boundary of the Broadway Precinct and consists of a single travel lane in each direction and time restricted parallel parking on both sides of the street for the majority of its length. The street provides access to the Building 10 car park and the Building 1 staff / service vehicle car park.

Jones Street - is a local street connecting Thomas Street in the north and Broadway in the south. The Jones Street and Broadway intersection is controlled by traffic signals. These signals include a right turn provision for buses into Jones Street from Broadway, in the form of a small right turn bay permitting filter turns. Immediately north of Broadway the street consists of two lanes southbound and one travel lane northbound. The street provides access to the open air gravel car park south of Building 10.

Ultimo Road - is a local collector road connecting Harris Street with Haymarket and China Town. It generally consists of a single lane in each direction with some parallel parking permitted adjacent to and opposite the UTS library in Building 5.

2.3 Existing Uses and Description of Activities

As stated in Section 2.1, the City Campus includes two precincts. The Broadway Precinct of UTS includes the following faculties:

- Engineering and Information Technology
- Design Architecture and Building;
- Arts and Social Sciences;
- Nursing, Midwifery and Health; and
- Science.

The spatial relationships between current major on-site uses are shown in **Figure 2**.

2.4 Student Enrolment

Across the City Campus as a whole, the current total approximate student population is some 23,700 students which for planning purposes equates to 18,450 EFTSL[1] (Equivalent Full Time student load).

The Broadway Precinct itself currently employs approximately 1,900 staff and provides teaching facilities for approximately 12,200 EFTSL.

[1] EFTSL is defined as a measure of the standard annual study workload of a student undertaking a full year of study on a full time basis

2.5 *Public Transport Network*

2.5.1 *Bus Operations*

Broadway provides the main east-west bus spine through the area with 24hour bus lanes installed on both sides across the frontage of the site. This is amongst the highest frequency strategic bus corridors currently in operation in Sydney.

Two bus stops for eastbound (inbound) services are located on Broadway near the University. The first, without a shelter, is located east of Wattle Street and the second has a single shelter and is located outside the main tower (Building 1) entrance.

A bus stop for westbound (outbound) bus services in Broadway is located directly opposite the main entrance to the University. This bus stop has a single bus shelter. Buses on Broadway provide direct service to the Sydney CBD, the Inner West and parts of the Eastern Suburbs.

The site is within convenient walking distance of Central Railway Station and Railway Square. In combination, these provide a very high degree of public transport accessibility with the provision of:

- Suburban and country trains
- A wide range of bus services
- Light rail linkage to the inner west
- Taxi rank
- Long distance tourist coaches

It is a short walk to:

- Lee Street for direct buses to the Northern Beaches, North West Sector and some eastern services
- Central Station for rail services throughout Sydney, intercity, country and interstate services, plus Light Rail
- Eddy Avenue for express bus services to UNSW and eastern suburbs services.

Combined bus service frequencies close to the site on a typical weekday summarised in the following tables.

Weekday 8am to 9am

Bus Stops	Inbound	Outbound	Total
Broadway	116	71	187
Broadway (east of Mountain Street) *	11	n.a.	11
Cleveland Street	2	2	4
Total	**129**	**73**	**202**

* Peak hour limited stops services set down and pickup at this bus stop that is located where Howard Street is located prior to its road closure. Table does not include school specials.

This service provision is very high by any standard. On average an eastbound bus stops every 30 seconds at the UTS Tower (Building 1) en route to Central Railway, with most going further into town. Heading out of town, in the westbound direction, there is more than one bus a minute, during the morning peak.

Even outside of the morning commuter peak, bus frequencies are high. The following tables summarise the number of buses per hour by direction for selected time periods.

Weekday 11am to 12 noon

Bus Stops	Inbound	Outbound	Total
Broadway	59	58	117
Cleveland Street	2	2	4
Total	**61**	**60**	**121**

Weekday 5pm – 6pm

Bus Stops	Inbound	Outbound	Total
Broadway	64	99	163
Cleveland St	3	3	6
Total	**67**	**102**	**169**

A further indication of the very good service frequencies in this area is that there is a bus every two minutes in each direction at the site on a Saturday morning between 7am and 8am.

2.6 Existing Rail Services

The nearest train station is Central. Almost all train services in Sydney call at Central, including suburban and inter-city services. As a result this station provides the most comprehensive access to Sydney's extensive CityRail network.

2.7 Existing Parking Capacity

Figure 3 shows the location and access points of each off street car parking area including the associated parking capacity. The service vehicle parking areas and their parking capacity are shown in **Figure 4**. These are summarised below.

2.7.1 *Public / Staff Parking*

The following locations include off street parking for both public and staff vehicles:

- Open air gravel car park with access from Jones Street and a parking provision for 101 cars for the general public and / or staff.
- Building 10 basement car park which includes 180 spaces for staff / public vehicles
- Building 1 Main Tower basement car park includes 27 spaces for staff.
- Building 6 basement car park includes 135 spaces for staff.
- Currently six (6) accessible parking spaces are provided outside the main tower with driveway access from Broadway.

2.7.2 *Service Vehicle Parking*

The precinct includes a number of loading bays and service vehicle parking areas in basement parking areas. These include:

- Loading dock in Turner Lane off Harris Street adjacent to the Main Tower Building 1 cafeteria. This can accommodate two medium rigid trucks (8.8m long) concurrently.
- 31 service vehicle parking bays on Basement Level 1 of the Main Tower Building 1 subsurface car park. Parking spaces can accommodate cars, utes, vans and small rigid trucks. The car park also houses the university's Toyota Coaster 22 seat bus.
- Three courier vehicle spaces adjacent to the driveway ramp from Thomas Street to Main Tower basement parking area.
- 12 service vehicle parking spaces beneath Building 10.
- 4 spaces beneath Building 6 for vans / couriers.

The existing parking areas are summarised in Table 1.

Table 1 - Existing Parking Capacity

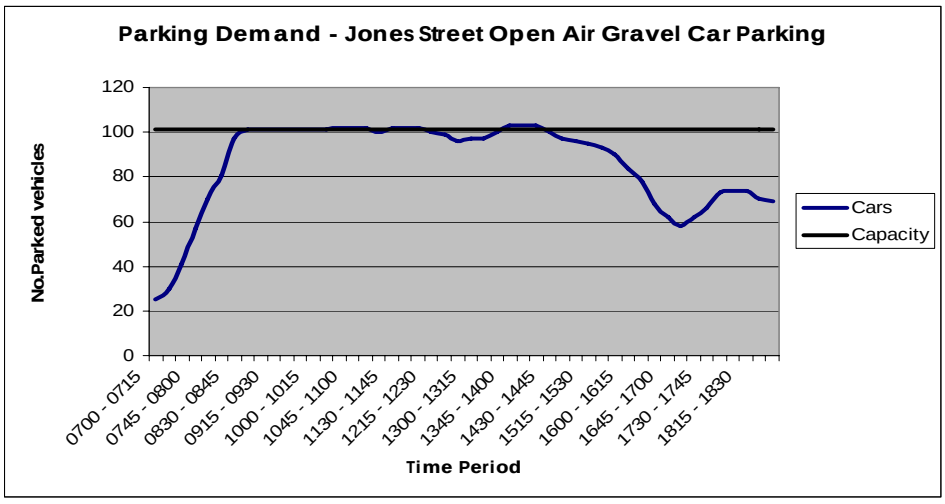
Location	No. Staff Spaces	No. General Vehicle Spaces	No Service Spaces
Building 10		180	0
Jones St Gravel Car Park		100	0
Building 1 Main Tower	27	33	33
Building 1 Main Tower courier parking	0	3	3
Building 1 Main Tower Cafeteria Loading Dock	0	2	2
Building 6		135	4
Total		**453**	**42**

2.7.3 *Parking Demand*

Surveys of off street parking areas under the care and control of UTS within the Broadway Precinct were undertaken on a weekday between the hours of 7:00am – 7:00pm. This included the separate recording of numbers of general vehicles and service vehicles.

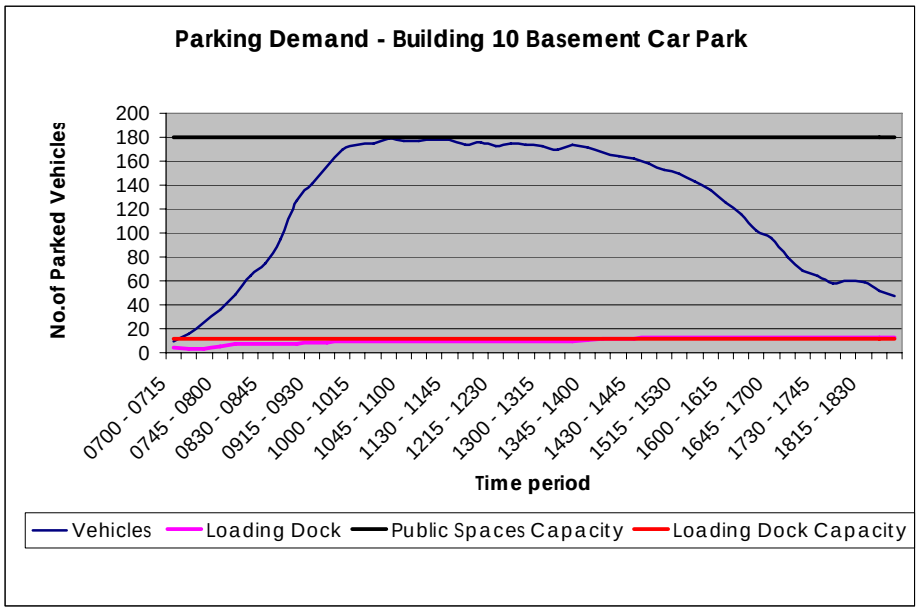
The observed use of the Jones Street open air gravel car park and the two basement parking areas under the Building 1 and Building 10 are shown in Charts 1 to 3 below.

Chart 1- Jones Street Gravel Car Park Parking Demand



From Chart 1 it can be seen that the existing open air gravel car park operates at capacity during most times of a typical working day with some spare capacity after 4:00pm. The current car park allows all day parking for either staff or the public for a charge of $13 per day.

Chart 2- Building 10 Basement Car Park Parking Demand



From Chart 2 it can be seen that the existing staff / public parking area operates at capacity between the hours of 9:30am – 3:00pm. The service parking bays are well utilised throughout most of the day.

This car park (in Building 10's Basement) includes pass access for staff and paid access for students and visitors. The current car park rate is a maximum of $18 per day.

Chart 3- Building 1 Main Tower Basement Car Park Parking Demand

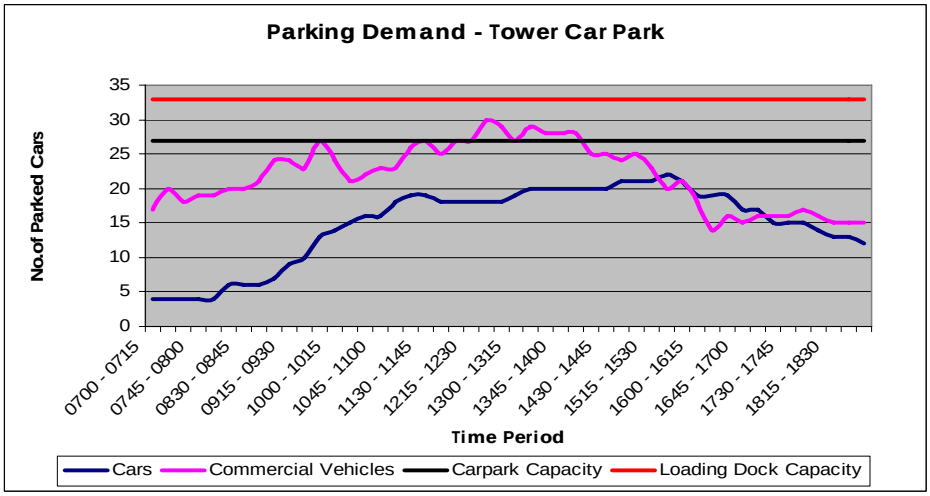


Chart 3 indicates that the staff car park beneath the Building 1 Main Tower currently operates during periods of peak demand with limited spare capacity of approximately 5 to 6 spaces. This may be attributed to the method of allocation of

parking spaces and does not reflect a lack of demand. The service vehicle parking area is also well utilised over most of the day.

2.8 *Existing Commuter Travel Patterns*

UTS Broadway sits within Transport Data Centre (TDC) travel zone 232. This zone's boundary follows Wattle Street from Broadway to Macarthur Street, and then along Macarthur Street across Harris Street into Haymarket and then south along Harris Street to Broadway, and back to Wattle Street. The land use in the zone comprises:

- UTS
- Sydney Institute of TAFE NSW
- A limited amount of residential property

The boundaries of this travel zone are shown in **Figure 5**.

Table 2 summarises the volume of commuter trips *originating* in this zone.

Table 2 – Commuter Travel Originating in Zone 232

Mode	Train	Bus	Car Driver	Car Passenger	Other	Not Travelled on Census Day	Total
JTW Trips	36	42	39	3	125	27	272
Mode Share of Travel	14.7%	17.1%	15.9%	1.2%	51.0%	na	

Source: Table 07 JTW dataset, 2006

The transit mode share (train, ferry, light rail and bus combined) is above the Sydney-wide average of 22%, with the car mode share (car driver and car passenger), at 17.1%, is below the Sydney-wide average of 72%. More than half of workers resident in this zone who travelled on Census day chose 'Other' mode (mainly walk and bicycle).

The top three destinations for commuters who reside in this zone and travelled to work on Census Day 2006 are:

- Sydney – 170 (68%)
- Leichardt – 12 (5%)
- North Sydney – 12 (5%)

These three destinations account for over three-quarters of commuter trips originating in this zone, with more than two-thirds working in Sydney LGA.

For commuters working in the zone, a summary is provided in Table 3.

Table 3 – Commuter Travel to Zone 232

Mode	Train	Bus	Car Driver	Car Passenger	Other	Not Travelled on Census Day	Total
JTW Trips	1,300	591	977	123	410	418	3,819
Mode Share of Travel	38.2%	17.4%	28.7%	3.6%	12.1%	n/a	

Source: Table 07 JTW dataset, 2006

The level of transit use and other mode share is relatively high; consequently, car use is modest.

The Broadway Precinct currently employs some 1,900 staff. Assuming say 25% of staff are not present on any one day and that not all would be present at any one time, with some 415 on site car spaces available in total, a mode share of some 31% to car driver / car passenger is a reasonable or even a high representation of staff travel behaviour, as reflected in the Census data. However it is noted that they would compete with both students and visitors for parking in some locations.

2.9 Existing Student Travel Behaviour

2.9.1 Student Postcode Data

The Broadway Precinct currently has 12,200 equivalent full time students. The University provided postcodes of the place of residence for all students who are currently enrolled at the University. In order to apply this information to transport planning, the postcodes were grouped by Statistical Local Areas[2] (SLAs). A copy of the postcode data grouped by SLA is provided in **Appendix A** of this report.

2.9.2 Walk / Cycle Mode Share

Sydney LGA accounted for 17.04% of the total number of students who attend the University. It has been assumed that all of these students would walk or cycle to and from the University.

2.9.3 Car Mode Share

A previous University of Sydney Transport Study[3] estimated the following mode share for that site:

Table 4 - Sydney University Estimated Mode Share

Car Driver / Passenger	Train	Bus	Walk	Cycle	Motorcycle	Other
22%	40%	10%	23%	3%	1%	1%

[2] SLAs are generally based on the boundaries of Local Government Areas (LGAs), although a number of LGAs in Sydney are comprised of up to four SLAs, including the City Of Sydney.
[3] University of Sydney Transport Study Working Paper 1 Existing Situation – Colston Budd Hunt & Twiney Pty Ltd April 1992

From Table 4 it can be seen that Sydney University, has rail as the highest mode of travel.

The University of Technology City Campus would have an even greater proportion of travel by rail because of its greater proximity to Central Rail Station and much greater restriction on parking in the area.

2.9.4 *Bus / Rail*

The estimated preferred mode of travel for each SLA was allocated based on the availability of bus and / or rail services within each area and a general appraisal of which mode would be likely to provide the more attractive journey. Where both bus and rail services were generally equally accessible, the students were proportioned to each mode. It should be noted that this proportioning was approximate and not based on a calculated generalised cost of travel for each mode in each instance.

The resultant allocated mode of travel for bus and rail for each SLA is presented in Table 5 below.

Table 5 - Allocated Bus / Rail Mode by LGA for Student Travel

LGA	Bus/Rail	Direction	Total	Bus	Rail
Botany Bay (C)	Bus	E	575	575	0
Randwick (C)	Bus	E	462	462	0
Baulkham Hills (A)	Bus	N	629	629	0
Hunters Hill (A)	Bus	N	70	70	0
Lane Cove (A)	Bus	N	507	507	0
Manly (A)	Bus	N	150	150	0
Mosman (A)	Bus	N	183	183	0
Pittwater (A)	Bus	N	223	223	0
Warringah (A)	Bus	N	527	527	0
Woollahra (A)	Bus/Rail	E	413	330	83
Ryde (C)	Bus/Rail	N	632	506	126
Ashfield (A)	Bus/Rail	W	425	340	85
Canada Bay (A)	Bus/Rail	W	845	676	169
Leichhardt (A)	Bus/Rail	W	491	393	98
Marrickville (A)	Bus/Rail	W	556	445	111
Waverley (A)	Rail	E	427	0	427
Gosford (C)	Rail	N	181	0	181
Hawkesbury (C)	Rail	N	97	0	97
Hornsby (A)	Rail	N	1734	0	1734
Ku-ring-gai (A)	Rail	N	687	0	687
Lake Macquarie (C)	Rail	N	33	0	33
North Sydney (A)	Rail	N	381	0	381
Willoughby (C)	Rail	N	109	109	0
Wyong (A)	Rail	N	164	0	164
Hurstville (C)	Rail	S	731	0	731
Kiama (A)	Rail	S	14	0	14
Kogarah (A)	Rail	S	325	0	325
Shellharbour (C)	Rail	S	61	0	61
Sutherland Shire (A)	Rail	S	670	0	670
Wollongong (C)	Rail	S	117	0	117
Auburn (A)	Rail	W	608	0	608
Bankstown (C)	Rail	W	769	0	769
Blacktown (C)	Rail	W	835	0	835
Blue Mountains (C)	Rail	W	163	0	163
Burwood (A)	Rail	W	342	0	342
Camden (A)	Rail	W	36	0	36
Campbelltown (C)	Rail	W	130	0	130
Canterbury (C)	Rail	W	990	0	990
Fairfield (C)	Rail	W	982	0	982
Goulburn Mulwaree (A)	Rail	W	1	0	1
Liverpool (C)	Rail	W	599	0	599
Parramatta (C)	Rail	W	878	0	878
Penrith (C)	Rail	W	236	0	236
Rockdale (C)	Rail	W	487	0	487
Wingecarribee (A)	Rail	W	35	0	35
Wollondilly (A)	Rail	W	187	0	187
Sydney (C)*		Local	4045 (17.04%)	0	0
		Total	23742	6125 (23.5%)	13572 (52.0%)

*As stated in Section 2.9.2, students residing within the Sydney SLA would walk or cycle to the Broadway Precinct

From Table 4 it is estimated that currently 23.5% of UTS students travel by bus, 52% travel by rail and 17% walk / cycle. The resultant overall estimated mode

share of travel of the students of the Broadway Precinct are summarised in Table 6 below.

Table 6 – Estimated Existing Student Travel Mode Share

Car Driver	Car Passenger	Rail	Bus	Walk / Cycle	Other	Total
5%	2%	52%	23.5%	17%	0.5%	100%

2.9.5 *Bus Occupancy Review*

Buses travelling to the site along Parramatta Road and City Road from the west, south west and south, covering a substantial proportion of existing student bus travellers. Buses along these corridors serve suburbs such as Tempe to the south; Marrickville, Kingsgrove and Canterbury to the south west; Leichardt, Ashfield and Concord to the west.

The peak loading of buses along these two corridors has traditionally occurred on Parramatta Road and City Road at the respective pedestrian bridges to Sydney University.

The total number of passengers seated and standing was recorded on every bus in both directions at these locations between the hours of 6:00am – 10:00am and 2:30pm to 7:00pm.

The purpose of these counts was to determine the available seated / standing spare capacity of existing bus services along these corridors.

It was assumed that 90% of the buses travelling past each location were 12.5m long buses which are licensed to carry 45 seated and 18 standing passengers. The remaining 10% were 14.5m long buses which are licensed to carry 61 seated and 34 standing. However, for various reasons standees are typically limited to some 15 patrons and therefore this standing capacity has been assumed on all buses.

The spare seated and standing capacity by hour at each location by direction is summarised in Tables 6 to 9 below.

Table 7 - Parramatta Road Inbound Bus Capacities

Hour	Recorded No. of Buses	Total Seat Capacity	Total Standing Capacity	Total No. Seated	Total No. Standing	Spare Seat Capacity	Spare Standing Capacity
Morning							
6-7 AM	20	932	300	420	2	512	298
7-8 AM	48	2237	720	1743	279	494	441
8-9 AM	62	2889	930	2209	438	680	492
9-10 AM	41	1911	615	958	102	953	513
Evening							
3-4PM	24	1118	360	389	10	729	350
4-5PM	41	1911	615	629	8	1282	607
5-6PM	27	1258	405	576	38	682	367
6-7PM	23	1072	345	412	41	660	304

Table 8 - Parramatta Road Outbound Bus Capacities

Hour	Recorded No. of Buses	Total Seat Capacity	Total Standing Capacity	Total No. Seated	Total No. Standing	Spare Seat Capacity	Spare Standing Capacity
Morning							
6-7 AM	11	513	165	136	0	377	165
7-8 AM	24	1118	360	375	16	743	344
8-9 AM	29	1351	435	626	25	725	410
9-10 AM	52	2423	780	497	6	1926	774
Evening							
3-4PM	35	1631	525	886	23	745	502
4-5PM	37	1724	555	913	39	811	516
5-6PM	49	2283	735	1688	198	595	537
6-7PM	46	2144	690	1478	152	666	538

From Table 6 and 7 it can be seen that on average each hour there is both space seated and standing capacity in the inbound and outbound directions on the Parramatta Road corridor.

Table 9 – City Road Inbound Bus Capacities

Hour	Recorded No. of Buses	Total Seat Capacity	Total Standing Capacity	Total No. Seated	Total No. Standing	Spare Seat Capacity	Spare Standing Capacity
Morning							
6-7 AM	13	606	195	294	16	312	179
7-8 AM	25	1165	375	853	44	312	331
8-9 AM	43	2004	645	1469	167	535	478
9-10 AM	35	1631	525	886	7	745	518
Evening							
3-4PM	21	979	315	441	10	538	305
4-5PM	34	1584	510	445	0	1139	510
5-6PM	31	1445	465	519	0	926	465
6-7PM	18	839	270	270	0	569	270

Table 10 – City Road Outbound Bus Capacities

Hour	Recorded No. of Buses	Total Seat Capacity	Total Standing Capacity	Total No. Seated	Total No. Standing	Spare Seat Capacity	Spare Standing Capacity
Morning							
6-7 AM	10	466	150	79	0	387	150
7-8 AM	16	746	240	243	2	503	238
8-9 AM	21	979	315	406	8	573	307
9-10 AM	39	1817	585	421	0	1396	585
Evening							
3-4PM	28	1305	420	733	67	572	353
4-5PM	29	1351	435	772	65	579	370
5-6PM	34	1584	510	1136	160	448	350
6-7PM	31	1445	465	941	97	504	368

As with the Parramatta Road corridor, Tables 8 and 9 indicate that there is also space capacity in both directions on the City Road corridor during morning and afternoon peak periods.

2.10 Identified Bus Stop Locations for UTS Broadway Precinct

There are a number of locations around the University where students would alight / depart buses. These are described further below.

From the west and south west buses travel along either City Road or Parramatta Road and drop off students in Broadway directly outside UTS Broadway Precinct.

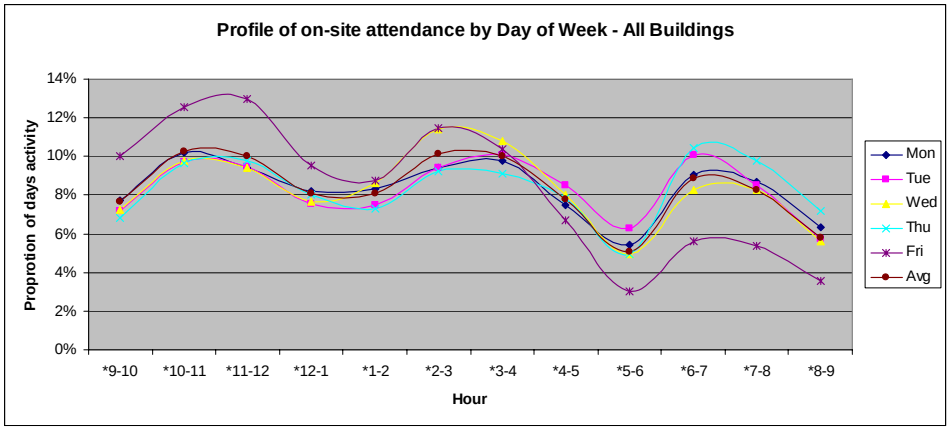
From the south the Botany Road services (e.g., Route 309) travels along Chalmers Street/Elizabeth Street calling close to the eastern entrance to the Devonshire Street pedestrian tunnel.

Some services from the North, such as the Palm Beach service (Route L90), terminate at Lee Street, adjacent to Railway Square. Similarly, private services from the North West also terminate there.

2.11 Timetabled Student Attendance Review

UTS provided the number of students enrolled each day by timetabled class. This information was grouped by hour to determine the timetabled attendance profile of existing students. The attendance patterns of existing students is shown in Chart 4 below and assumes all students enrolled in each class are in attendance.

Chart 4 – Timetabled Attendance Patterns of All Broadway Precinct Students



From Chart 4 above it can be seen that the timetable classes each day result in three student peak loadings, of variable magnitude, across the Broadway Precinct. These three peaks occur at around 9am, 3pm and 6 pm.

A large proportion of full time students typically arrive during the morning peak, attending for, say 1 to 2 half days per week. Half days normally end or commence during the middle of the day.

Part time students may attend 1 to 2 classes per day. These classes would start either in the morning, afternoon or in the evening. The peak attendance periods in Chart 4 reflect this likely attendance patterns.

2.12 Door Count Review

Arrival and departure counts of all persons walking into and out of buildings within the Broadway Precinct were undertaken between the hours of 7:00am and 7:00pm. Chart 5 shows the profile of on-site attendance based on the door counts undertaken.

Chart 5 – Total Pedestrian Count of all Broadway Precinct Buildings

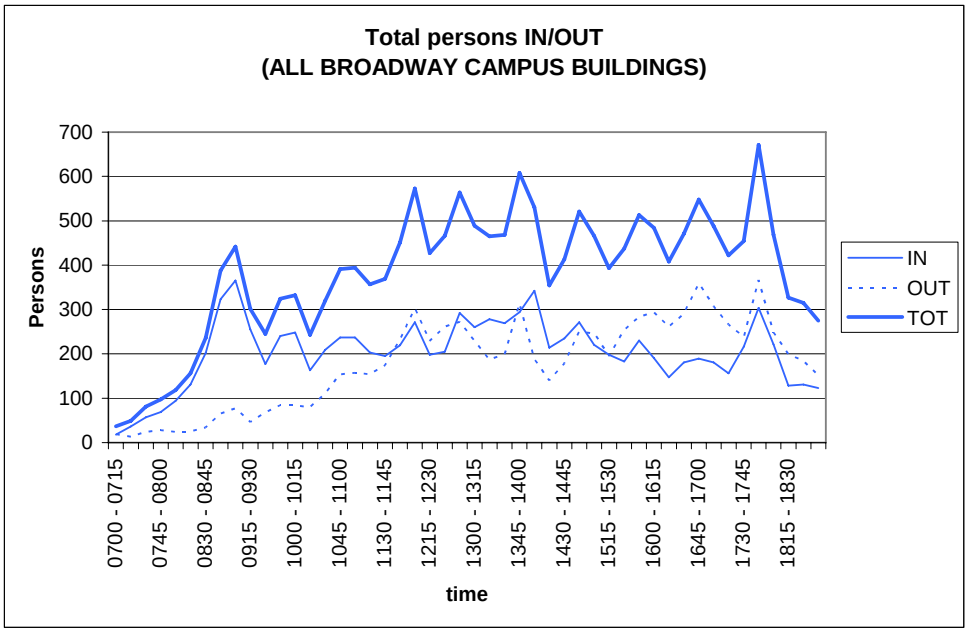


Chart 5 indicates early morning, midday and evening attendance peaks with the highest occurring in the evening.

The counts undertaken between the hours of 7:00am to 7:00pm of buildings within the Broadway Precinct recorded 18,350 persons with 9,805 walking into and 8,545 walking out of buildings.

This door count profile is reflective of daily attendance patterns and has been used to estimate attendance patterns for the projected increase in student numbers.

2.13 Pedestrian Routes of Travel from Transport Nodes

The routes of travel for students alighting and departing from the bus stop locations described in Section 2.10 and the estimated daily volumes of students walking to and from the University are shown in **Figure 6**. This includes the number of students expected to walk to and from Central Rail Station.

3 Strategic Context

3.1 *Overview*

From a top down perspective, several echelons of State Government pronouncements of the past three years set a broad and evolving framework for land use and transport policy and development. These are:

- Strategic land use and transport planning in Sydney is guided to some extent by the Metropolitan Strategy (released in December 2005) plus subsequent sub-regional strategies.
- In addition, the Urban Transport Statement (November 2006) set out a series of projects, some of which were in the Metropolitan Strategy, to develop Sydney's transport network further. This statement was broadly in accordance with the State Plan, although it did accelerate some previously announced projects.
- More recently, the previous government announced plans for a Metro system within Sydney (March 2008) with the North West Metro to proceed to a compressed planning and construction schedule.
- The Mini-Budget (November 2008) confirmed that the North West Metro was not to proceed in the foreseeable future.
- Proposed CBD Metro (December 2008) to be investigated as a high priority project with Commonwealth funding. Commitment likely early in 2009.

Abstracting from these documents and looking at the current priorities which are the main focal point of planning, the main strategic planning themes to be considered are:

- Continued strong growth in Sydney of both population and employment.
- Major reform of the bus system over the past four and a half years, with implementation on-going.
- On-going major capital investment to stabilise and improve the current heavy rail system, through Clearways and the nearly-completed Epping to Chatswood Rail Line (expected to open some time in 2009).

The next section summarises the main formal strategic planning documents, whilst the subsequent section discusses the implications of the more immediate proposals.

Based on recent statements by the State Government, in particular the NSW's Mini-Budget[4] on 11 November 2008, it is expected that the strategic planning outlook will be adjusted further over the next six to 12 months. To some extent it is likely to be framed by the willingness of the Commonwealth Government to financially support (at least partially) a number of major initiatives. The CBD Metro partially reflects this evolving situation, as noted above.

3.2 Strategic Plans - Transport

3.2.1 Metropolitan Strategy (December 2005)

This Strategy set the long term direction for Sydney's land use and economic development when it was released. However, it now appears to be dated and has lost its primacy in setting the long term direction for planning, especially for transport.

One of the few changes to statutory plans affecting transport that accompanied the Metropolitan Strategy was the withdrawal of Draft SEPP 66 (Land Use and Transport), but the continuance of the Integrated Land Use and Transport Policy Package that had accompanied the Draft SEPP. This continuance was given effect through Section 117 directions issued by the Planning Minister in September 2005[5].

The release of the Urban Transport Statement and Sydlink (see separate sections below for each) has reinforced some of the concepts in the Metropolitan Strategy, such as strategic bus corridors and rail clearways. These documents have changed priorities of projects and supplanted other concepts.

3.2.2 Urban Transport Statement (November 2006)

This document provides a comprehensive outline of the transport improvement projects planned for Sydney, with a year-by-year schedule of rail system upgrades.

The Urban Transport Statement provides a concise summary of travel patterns in Sydney's major corridors, many of which are anchored on the CBD.

[4] Refer to http://www.treasury.nsw.gov.au/?a=12713 for a link to the Mini Budget and the NSW Treasurer's speech; these include changes to planning responsibilities for some lands

[5] The September 2005 Section 117 direction was superseded by July 2007 Section 117 direction #3.4

3.2.3 *Sydlink – North West Metro – now deferred indefinitely*

This proposal was announced in March 2008 to build the North West Rail Link (from Epping to Rouse Hill) as a Metro Line, with a separate connection to the CBD from Epping via the Victoria Road corridor. This was proposed to open sometime around 2016 or 2017. It would have provided a mass transit link between Sydney's growing North West and the CBD, as well as connecting a number of medium scale demand generators along the way.

3.2.4 *Mini-budget 11 November 2008*

Main transport-related measures of relevance:

- Indefinite deferment of the North West Metro.
- Acceleration of the delivery of 300 additional buses, including 100 for north west Sydney.
- Development of lower cost capacity increases and improvements to service levels on CityRail's network. This is potentially the most significant proposal, which might address issues with rolling stock design which reduces effective system capacity at busy times of operation.

This last proposal seems to pick up on some of the proposals outlined in the Urban Transport Statement, for example, relating to substitution of eight-car trains for six-car trains. However, it does go further, suggesting that investigations into the gradual conversion of network operations to higher-frequency single-deck rolling stock (refer to pg5-3 of Mini Budget) might be undertaken.

3.3 Forward Plans and Trends

3.3.1 *Population growth*

The most recent projections of population growth by the state at SLA level were published in 2007 (designated the 2005 Release), whereas the most recent regional level forecasts were published in 2008. A summary of existing and projected future population is in the following table.

Table 11 – Comparison of projections of population, from 2006 to 2021

	Population - 2001	Population - 2031	Difference
2005 Projections			
Sydney LGA[6]	162,580	236,610	+ 74,030 (46%)
Sydney (SD)	4,310,099	4,922,646	+ 612,547 (14%)
	Population - 2006	**Population - 2021**	**Difference**
2008 Projections			
Sydney SD	4,282,000	5,104,100	+ 822,100 (19.2%)

Note – 2005 SLA projections use the 2005 Australian Standard Geographical Classification (ASGC 2005).

[6] Sydney LGA is aggregation of SLAs 7201, 7203 and 7205

Source: New South Wales Statistical Local Area Population Projections 2001-2031, 2005 Release, NSW Government Department of Planning, 2007 and New South Wales State and Regional Population Projections, 2006-2036, 2008 Release, NSW Government Department of Planning, 2008

The 2005 projections indicate a high level of growth is expected to occur over the 15 year period to 2021 for Sydney LGA – which was projected to increase around three times faster than Sydney as a whole. The 2008 Sydney-wide projection is substantially above the estimate contained in the 2005 Release. These projections tend to be volatile from release to release as they are generally based (at Sydney SD level) on some continuation of past trends, and elements of these trends have been varying markedly in recent years.

3.4 Sustainable Sydney 2030 Strategic Plan

This plan provides a framework of proposals for the Sydney CBD.

An extract of particular relevance to UTS is as follows:

"New road links may provide opportunities to reclaim road space elsewhere. This could be planned in conjunction with major investment in regional public transport. New roads divert traffic from existing roads and action has to be taken at the time the new routes are opened to provide greater priority for public transport, cycling or walking, or for improvements to the amenity of adjacent land use, on these existing routes. For example, construction of the M4 East and extensions must also free up roads such as Pyrmont Bridge Road, Cleveland Street, Botany Road and Harris Street for these to have a more liveable function."[7]

This approach flags the desired outcome of reduced traffic volumes in Harris Street in the future to create a more liveable environment. This would in turn improve the pedestrian / cyclist amenity between the UTS campus buildings. However, any traffic relief on Harris Street is predicated on the M4 East project. Given uncertainties about the nature and timing of this it would be prudent to undertake the current planning exercise on the basis of Harris Street as it operates today.

3.5 Comments on Strategic Context

The population of the Sydney LGA is indicated to increase at a rate over and above that of the rest of the Sydney Metropolitan area. In turn this will increase the potential 'local' pool of potential students within UTS Precinct's catchment. The increased population in close proximity to the university, combined with constrained parking provision on site will improve the potential for students to further increase the already high share of travel by non private vehicle modes.

[7] Sustainable Sydney 2030 Final Consultation Draft – Integrated Transport for a Connected City Objective 3.4 - City of Sydney

With this in mind, the expansion of the Broadway Precinct represents a development which is in line with current planning policies and is one which seeks to reduce the impacts of generated traffic.

4 The Proposed Development

The Concept Plan involves the demolition, construction and extension of certain buildings on the Broadway Precinct to enable UTS to provide an additional 84,750m² of gross floor area [8] of education, social and sporting facilities, including student housing. The proposal will also enhance existing open space and improve pedestrian, bicycle and vehicular access into the Campus. The project will deliver facilities for up to 15,000 EFTSL (equivalent full time student load) on the campus by 2015, up from 12,200 in 2008.

Concept approval is sought for the following at the UTS Broadway Campus, as illustrated in **Appendix B**:

- Demolition of existing Building 11 (81 Broadway), Building 12 (113 Broadway) and Building 13 (115 Broadway).
- Building 1 – extension to podium of existing building to a height * of 22.47 metres to provide an additional 4,050 m² of gross floor area for educational and cultural uses.
- Building 2 – extension to, and refurbishment of, existing building to a height of 24.24 metres to provide an additional 6,750 m² of gross floor area for educational uses.
- Building 3 – modifications to existing building to provide café or retail uses on Level 1.
- Building 4 – modifications to existing building to provide café, retail uses or public facilities on Level 1.
- Building 6 –
    - extension and modifications to Levels 1-7 of the existing building to provide approximately 5,950m² of gross floor area for educational,
    - retail or café uses; construction of a new 69.20 metre high extension to provide approximately 19,300 m² of gross floor area for student accommodation;
    - new pedestrian link between Harris Street and the Ultimo Pedestrian Network through Building 6.

[8] Note: Gross floor area and building height are measured in accordance with the definition applying to Ultimo-Pyrmont in Sydney Local Environmental Plan 2005 (see **Section 4.4**).

- Building 10 – modifications to existing building to provide vehicular access into the new Broadway Building at basement level, and pedestrian access at ground and upper levels.
- Broadway Building – construction of a new 44.47 metre high building to provide 34,650 m² of educational, and café or retail uses plus basement car parking for approximately 160 relocated spaces.
- Thomas Street Building – construction of new 27.10 metre high building to provide 10,000 m² of gross floor area for educational, cultural and café or retail uses.
- Alumni Green –
    - landscaping;
    - below ground book storage vault (2,250 m² of gross floor area);
    - below ground multi-purpose sports hall (1,800 m² of gross floor area).

Public domain improvements to Broadway and Thomas, Harris, Wattle and Jones Streets

4.1 Access and Parking

The development does not propose any increase in on site parking provision. The existing open air gravel car park off Thomas Street would be reconstructed as a basement car park beneath the proposed 'Broadway' building. Access to this car park would be via the existing driveway access from Thomas Street through Building 10.

Works on Building 2 will result in the loss of some staff parking spaces within the basement car park beneath Building 1. However the service vehicle provision would be retained. Displaced parking spaces will be accommodated in the new Broadway building.

Works on Building 6 will result in the loss of some staff parking within the basement car park beneath Building 6. Displaced parking spaces will be accommodated in the new Broadway Building.

The existing service dock, which is accessed from Harris Street via Turner Lane beneath the pedestrian overbridge, would be removed and the servicing would be relocated to the main service vehicle car park beneath Building 1, accessed from Thomas Street.

The closure of Jones Street is not proposed as part of this application. The closure of Jones Street would be subject to a separate planning application.

The development would provide bicycle parking in accordance with Sydney City Council's DCP.

5 Estimated Future Student Travel Behaviour

5.1 *Introduction*

This section of the report presents the methodologies used to estimate the travel behaviour of students at the expanded Broadway Precinct. As noted in Chapter 4, the proposed development is expected to result in an addition 2,800 EFTSL students enrolled at the Precinct.

5.2 *Estimated Additional Student Arrival / Departure Profiles*

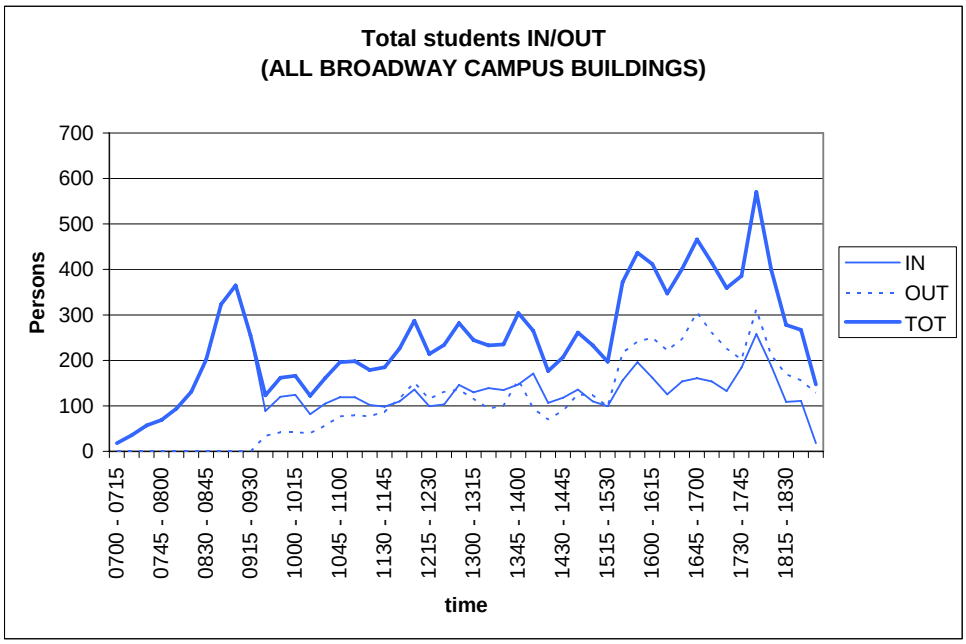
As stated in Section 2.12, door counts of the Broadway Precinct were undertaken between the hours of 7:00am – 7:00pm. This provided an arrival and departure profile of all persons entering and leaving the buildings. The arrival and departure profile of the precinct as a whole as shown in Chart 5 (refer to Chapter 2).

To estimate the number of *students* walking into and out of buildings within the Broadway Precinct, the following arrival / departure profile was assumed:

6:00am – 9:30am	100% of arrivals were students 0% of departures were students
9:30am – 3:30pm	50% of arrivals were students 50% of departures were students
3:30pm – 7:00pm	85% of arrivals were students 85% of departures were students

The balance of movements would be between buildings or to / from other facilities in the area. The resultant student arrival and departure profile by hour based on the above distribution is presented in Chart 6.

Chart 6 – Assumed Broadway Precinct Student Arrival / Departure Profile



Based on the above profile, it was estimated that there were 6,503 inbound and 5,395 outbound (total 11,898) student movements over the 12 hour survey period. The difference in inbound and outbound volumes can be attributed to a proportion of the students attending classes beyond 7:00pm.

It was also assumed that the additional 20% in student population would result in a 20% increase in the arrival / departure activity shown in Chart 6. The resultant number of additional students arriving and departing by hour is shown in Table 12 below.

Table 12 - Forecast Increase in Student Trips

	Period	*IN*	*OUT*	TOT
100% IN = students, 0% OUT = students	0700 - 0715	4	0	4
	0715 - 0730	7	0	7
	0730 - 0745	11	0	11
	0745 - 0800	14	0	14
	0800 - 0815	19	0	19
	0815 - 0830	26	0	26
	0830 - 0845	40	0	40
	0845 - 0900	65	0	65
	0900 - 0915	73	0	73
	0915 - 0930	51	0	51
50% IN = students, 50% OUT = students	0930 - 0945	18	7	25
	0945 - 1000	24	8	32
	1000 - 1015	25	8	33
	1015 - 1030	16	8	24
	1030 - 1045	21	11	32
	1045 - 1100	24	15	39
	1100 - 1115	24	16	40
	1115 - 1130	20	15	36
	1130 - 1145	20	17	37
	1145 - 1200	22	23	45
	1200 - 1215	27	30	57
	1215 - 1230	20	23	43
	1230 - 1245	21	26	47
	1245 - 1300	29	27	56
	1300 - 1315	26	23	49
	1315 - 1330	28	19	47
	1330 - 1345	27	20	47
	1345 - 1400	29	31	61
	1400 - 1415	34	19	53
	1415 - 1430	21	14	35
	1430 - 1445	24	18	41
	1445 - 1500	27	25	52
	1500 - 1515	22	25	47
	1515 - 1530	20	20	39
85% IN = students, 85% OUT = students	1530 - 1545	31	43	74
	1545 - 1600	39	48	87
	1600 - 1615	32	50	82
	1615 - 1630	25	44	69
	1630 - 1645	31	49	80
	1645 - 1700	32	61	93
	1700 - 1715	31	52	83
	1715 - 1730	27	45	72
	1730 - 1745	37	40	77
	1745 - 1800	52	62	114
	1800 - 1815	38	42	80
	1815 - 1830	22	34	56
	1830 - 1845	22	31	53
	1845 - 1900	21	26	47
	Total	**1318**	**1079**	**2397**

From Table 12 it is estimated that over a 12 hour period a 20% increase in EFT students would equate to an additional 1,318 inbound and 1,079 outbound daily person trips.

5.3 Forecast Increase in Student Transit Trips

The travel mode share of existing students was applied to the increase in student arrival and departure trips to estimate increased travel by mode.

To determine the split between bus and rail, the additional student trips were then proportioned by SLA reflecting the existing distribution of student's SLA of origin. From this, the number of inbound and outbound walk, bus and rail trips were determined. The number of new daily (12-hour) inbound and outbound trips by mode is summarised in Table 13.

Table 13 - Additional Inbound and Outbound Student Trips by Mode

	Car Driver	Car Passenger	Rail	Bus	Walk/Cycle*	Other	Total
	5.0%	2.0%	52.9%	23.9%	15.8%	0.5%	100%
IN	66	26	697	314	208	7	1318
OUT	54	22	571	257	170	5	1079

*All students living with the Sydney LGA have been assumed to walk to and from the University.

It should be noted that the additional student trips by mode listed in Table 13 would occur over a 12 hour period of a typical weekday.

6 Implications of the Proposed Development on Transport Services

6.1 Introduction

The overall transport outcome of the Concept Plan will reflect how activities on the site develop over the course of the plan as well as the delivery of regional and sub-regional transport system outcomes by the State, as discussed in Chapter 3 above. This chapter outlines the likely future situation for each mode and identifies measures that require consideration at this stage of the planning process.

6.2 Road network

Implications for the road network in terms of capacity, traffic management and parking are described in 'Concept Plan – University of Technology Sydney (UTS) Broadway – Traffic Report' (HalcrowMWT, January, 2009).

In summary due to the absence of additional car park, there would be very little additional road traffic hence traffic impacts would be minimal.

6.3 Rail Travel

Across the Sydney region, CityRail provides a vital transport function, especially during the commuter peak periods to dense rail-served centres, such as the CBD and those on the lower North Shore. The network is currently subject to major capital works that aim to stabilise the system and improve its reliability. In addition, the Epping to Chatswood Rail Link and elements of the Clearways Program will expand system capacity.

The NSW Government is considering a number of ways of expanding system capacity. These include network augmentation as well as potential re-introduction of single deck rolling stock or some form of modification to the design of rollingstock. In addition, the development of a Metro System, whilst recently curtailed, is still an active and funded program, which could at some stage expand again.

The benefits of these rail system improvements will be felt progressively. They are expected to support the State Government's targeted increase in the share of travel undertaken by transit.

As stated in Section 5.3 of this report, the increase of 2,800 EFTSL students at the Broadway Precinct is estimated to generate an additional 697 inbound and 571 outbound student trips by rail over a 12 hour period on a typical weekday.

This increase in rail patronage is expected to contribute a modest increase in demand on existing services.

It is noted that State Rail has indicated during discussions with representatives of UTS that they have concerns with the adequacy of the Devonshire Street pedestrian tunnel to accommodate the proposed student growth. A capacity analysis of this tunnel and any consequential investigation of capacity enhancement options is beyond the scope of this report. This is because this is a transport infrastructure element of regional significance and any decision on how to manage it cannot be based on the effects of a single development component.

However, to assist State Rail in their future planning of tunnel capacity, the increase in the number of inbound and outbound students travelling by rail by hour on a typical weekday is provided in **Appendix C** of this report.

6.4 Bus Services

It is estimated that there would be an additional 314 inbound and 257 outbound bus trips generated by the additional 2,800 EFTSL students between the hours of 7:00am – 7:00pm on a typical weekday. The expected increase in inbound and outbound bus trips grouped by origin is summarised in Table 14 below:

Table 14 - Estimated Increase in Bus Trips by Origin (12 hour period)

Suburb	Bus/Rail*	Direction I/B to Uni	Inbound Student Trips	Outbound Student Trips
Botany Bay (C)	Bus	E	30	24
Randwick (C)	Bus	E	24	19
Woollahra (A)	Bus / Rail	E	17	14
		Total	**71**	**57**
Baulkham Hills (A)	Bus	N	32	26
Hunter's Hill (A)	Bus	N	4	3
Lane Cove (A)	Bus	N	26	21
Manly (A)	Bus	N	8	6
Mosman (A)	Bus	N	9	8
Pittwater (A)	Bus	N	11	9
Warringah (A)	Bus	N	27	22
Ryde (C)	Bus / Rail	N	26	21
		Total	**143**	**116**
Ashfield (A)	Bus /Rail	W	17	14
Canada Bay (A)	Bus /Rail	W	35	28
Leichhardt (A)	Bus / Rail	W	20	17
Marrickville (A)	Bus / Rail	W	23	19
		Total	**95**	**78**
		Grand Total	**314**	**257**

*Students have the option to travel by bus or rail from certain suburbs. The number of students travelling inbound and outbound in this table is the estimate of bus passengers only.

The estimated increase in bus patronage by the increase in student numbers at the Broadway Precinct is considered marginal and it is expected that existing bus services would be able to cope with the additional demand. In any event it is current practice to monitor service capacity requirements and to add buses to match demands as they are revealed.

6.5 Pedestrians / Bicycles

6.5.1 Pedestrians

Whilst the volume of traffic on the surrounding road network is a barrier to free pedestrian movement, all roads surrounding the campus include signalised pedestrian crossings.

Should the closure of Jones Street proceed in the future, as has previously been proposed this would improve pedestrian linkages between buildings in the eastern and western areas of the Precinct. However, as Jones Street is a relatively lightly trafficked street current conditions for crossing pedestrians are relatively easy, with pedestrians observed to cross freely at mid-block.

An inspection of existing pedestrian paths around the Broadway Precinct found that in many locations the combination of bus shelters, street furniture, advertising boards and street trees clutter the pathways and impede pedestrian flows. These locations include Harris Street between Thomas Street and Broadway and Broadway between the existing main entrance of UTS (to Building 1) and Harris Street.

It is noted that the City of Sydney's Sydney 2030 document includes a proposal to ultimately reduce traffic volumes in Harris Street. If this objective was achieved, there may be an opportunity to remove a travel lane from Harris Street and provide widened footpaths on either side, for at least part of its length. This would benefit pedestrian amenity in the area generally but is not necessitated by the UTS Concept Plan proposal.

The proposed relocation of the library from the Haymarket Precinct to the Broadway Precinct would place this major facility closer to the main population of students of the University as a whole. This would reduce the number of pedestrians having to walk between the two campuses, across the highly trafficked Harris Street and Ultimo Road.

It is envisaged that any new building works along Broadway would include new paving to existing footpaths in general accordance with Council's design guidelines.

The extension of the Building 1 Main Tower to the boundary line in Broadway and the construction of the Broadway building would afford improved shelter for pedestrians walking along the northern side of Broadway. Therefore, the design process should consider how best to provide weather protection for pedestrians in this location.

6.5.2 *Cyclists*

The Frasers Broadway development, located on the southern side of Broadway, opposite UTS, includes an extension of the The Parkway[9] cyclepath from Chippendale through the site to Broadway. The proposed closure of Jones Street within the Sydney Institute of Technology includes the northern section of this existing bike route.

[9] The Parkway is a concept plan for a green off-road pedestrian-cycle route through Chippendale. It has a primary north - south axis linking the City & East Darling Harbour to Alexandria, Newtown and the Australian Technology Park through Chippendale and an east-west axis linking Glebe to the University of NSW. The Parkway Concept evolved from community suggestions as part of the City of Sydney Council Chippendale Improvement Plan.

The closure of Jones Street, whilst not proposed as part of the Concept Plan but supported by the University in principle, would fill the 'missing link' to join these two sections of the Chippendale bike route.

Bicycle parking facilities would be provided as part of the redevelopment of the campus.

6.6 Construction Traffic Management

A separate Construction Traffic Management Plan is to be submitted in relation to the proposal. Whilst at this stage of planning the formal construction methodologies have not been determined, the following principles should be considered given the site is located close to major transit hubs and the existing high number of pedestrian movements in and around the development site.

- The Construction Management Plan p shall include proposed truck parking areas, construction zones, crane usage, truck routes etc.
- Truck access from Broadway should be avoided unless no other suitable option is available.
- Pedestrian movements along footpaths are to be maintained at all times on major roads surrounding the site including Wattle Street, Broadway and Harris Street.
- Trucks must enter and leave the site in a forward direction unless accredited flag persons are in place to control traffic and pedestrians.
- Access to the site for construction heavy vehicles (trucks) will be restricted during construction to any proposed construction zone.
- The Building Contractor will maintain strict traffic management procedures to ensure the safety of the public road users and pedestrians utilising traffic wardens.
- All vehicles carrying materials to, or from the site must have their loads covered with tarpaulins or similar covers.
- Openings in the construction fencing at the construction access driveways will be managed and controlled by qualified site personnel.
- Pedestrian warning signs and flashing lights are to be erected adjacent to all construction access driveways.
- All major contractors are aware of inefficient double handling and material wastage. Government initiatives have provided incentives for recycling, reuse and source separation of waste materials. · The construction process will involve source separation of materials to facilitate the recycling objectives

6.7 Items for Consideration in a Voluntary Planning Agreement VPA

This section provides a description of improvements which may be considered as part of a Voluntary Planning Agreement.

6.7.1 Discussions with State Transit

A meeting was held with representatives of State Transit to discuss potential capacity constraints on the existing bus network, opportunities to improve the existing network and what public transport improvement items should be considered as part of the redevelopment of the Broadway Precinct. The minutes from this meeting are provided in **Appendix D** of this report. The recommendations of State Transit have been included in the suggested items for inclusion in a VPA.

6.7.2 Pedestrian Improvements

The extension of Building 1 to the boundary line in Broadway and the construction of the Broadway Building on Broadway, between Jones Street and Wattle Street, enable the opportunity to provide shelter from inclement weather for pedestrians. Shelter along Broadway should be considered as part of the design of these buildings.

If shelter was provided, it would also allow the removal of the stand alone bus shelter outside the main entrance to Building 1. Its passenger information function would be provided by a bus stop plinth. This would remove an existing impediment to pedestrian movement in a location which carries large volumes of pedestrians.

The DGRs require consideration to be given to the possible need for midblock pedestrian crossings with specific reference to crossings of Broadway. In order to examine the possible need for these or other midblock crossings, Figure 7 was prepared to show the spatial relationship between the existing main doorways which provide access throughout the City Campus and the locations of the surrounding existing pedestrian crossing facilities. From **Figure 7** it can be seen that for the majority of access doorways to buildings within the City Campus that pedestrians only have to walk a short distance to gain access to existing formal crossing facilities. Of note, those pedestrians who wish to walk between Building 1 and 10, may use either the pedestrian signals at Broadway / Jones Street or cross Jones Street mid block after walking along Alumni Green.

Whilst Jones Street is the only street without formal pedestrian facilities, the street is a low speed environment with low traffic flows. Traffic flows on this street will be further reduced following the construction of the Broadway building as the access to the existing car park (currently gravel) will be relocated to Thomas Street. Traffic flows on Jones Street are and will remain low such that a formal "warrant" for a midblock pedestrian crossing as required by the RTA would not be met.

Figure 7 also shows the principal pedestrian travel desire lines on routes to and from the precinct. These all follow routes with safe road crossing facilities and in fact are already well used.

In particular it is noted that there are three signalised pedestrian crossing points on Broadway near the precinct. These are located at Regent/Harris Streets, Jones Street and Abercrombie/Wattle Streets. It is neither necessary, nor desirable that any more be provided as the existing crossing points line up with present or future pedestrian routes to the south. Additionally it is noted that any additional mid-block crossings would compromise traffic flows along Broadway. This is an important arterial access route to the CBD and a major bus corridor

Of particular importance is the future pedestrian and cycle route that will cross the Frasers Broadway site on the alignment of Balfour Street. This will form a major pedestrian route and cycle route through Chippendale and Ultimo (on Jones Street) between Cleveland Street and Fig Street.

Overall it is considered that present pedestrian road crossing provisions are satisfactory and that no new midblock pedestrians crossing facilities are needed.

6.7.3 *Cyclists*

Any redevelopment of an existing building and construction of new buildings should include adequate bicycle parking and amenity facilities.

6.7.4 *Public Transport*

There are two main bus stops eastbound in Broadway outside the University. The first is located just east of Wattle Street and the second is located directly outside the main entrance to Building 1.

There is an opportunity to amalgamate these two bus stops on Broadway into a larger, more central bus stop north of Jones Street. This amalgamated city bound stop would be located directly opposite Balfour Street of the Frasers Broadway development which has been identified as the main pedestrian spine through that site.

Any amalgamation of these two bus stops would need to include adequate shelter, which is discussed above in the context of potential to provide more general weather protection along the northern side of Broadway.

The construction of the Broadway Building should include shelter in Jones Street for the existing Route 501 bus service. Shelter is currently provided by a building awning and at least the same level of shelter and seating facilities should be provided within a new shelter incorporated in or adjacent to the new building whilst the Route 501 bus includes Jones Street.

It is noted that the recent approval of the Frasers Broadway development opposite UTS included the following condition of consent:

"Condition B8 – Road
b) demonstrate that the design of roads shall include signalised intersections at the following locations:

i) Intersection of Broadway with Balfour Street with the provision of a right turning lane from Broadway into Balfour Street, and the closure of Jones Street"

Therefore the closure of Jones Street will occur sometime in the future when the intersection of Balfour Street and Broadway is completed as part of the Frasers Broadway development.

6.7.5 *Travel Access Guide*

There is clearly high use of transit services by students and staff of the University. The University should be proactive in providing up to date public transport information to new students and staff as part of its welcome packs. Currently, State Transit produces a travel information guide for universities, including UTS. This is available on their website (www.sta.nsw.gov.au). This guide would be a useful starting point for such an information pack.

7 Conclusions and Recommendations

This report describes the unique features of the UTS Broadway Precinct's current operation and its transport situation. These features include:

- Very high transit mode share by existing students and staff.
- A site which is located in close proximity of Sydney's major rail station and a substantial number of bus services which provide extensive coverage of UTS's catchment.
- A constrained level of on-site parking provision.

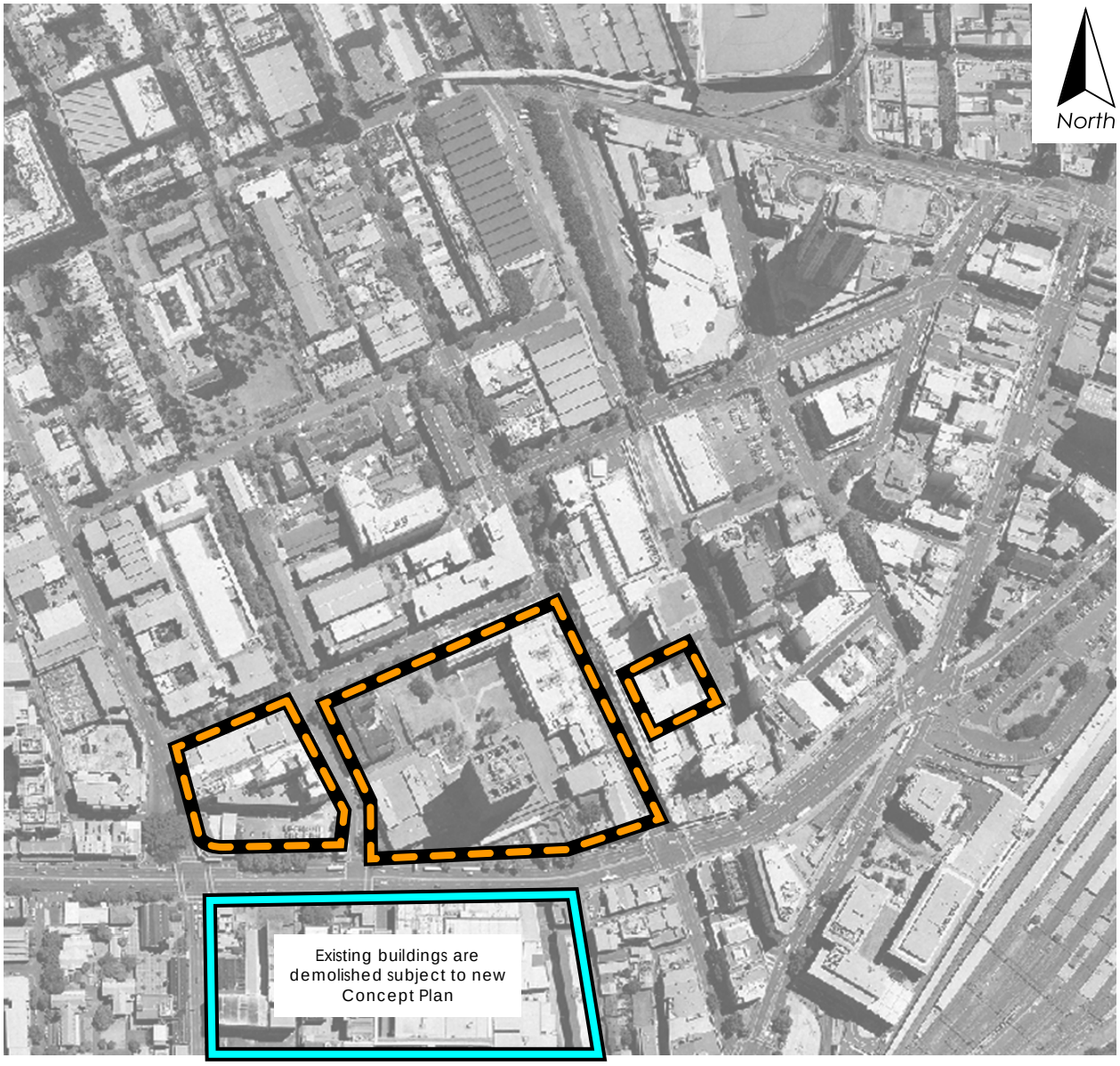
Analysis of the strategic context in which the UTS Broadway Precinct sits identifies several themes of direct relevance to this project, including:

- No additional onsite parking is proposed. This will constrain traffic generation and is in line with recommendations of the Green Building Council of Australia's Green Star Manual and the recommendation by the Ministry of Transport in their response as part of the Director General Requirements for this project.
- Potential increase in patronage on many bus routes travelling to and from the CBD, at various times of the day, which in turn improves the viability of these services. The incremental patronage is modest in the context of the current system.
- Provision of an expanded University facility which is located within an area projected to have population growth well above the average population growth of Sydney.

It is recommended that this TMAP be discussed with relevant transport agencies through the planning process and that the project design team investigate the feasibility of the proposals in this TMAP.

UTS CITY CAMPUS PRECINCT

UTS TRAFFIC REPORT

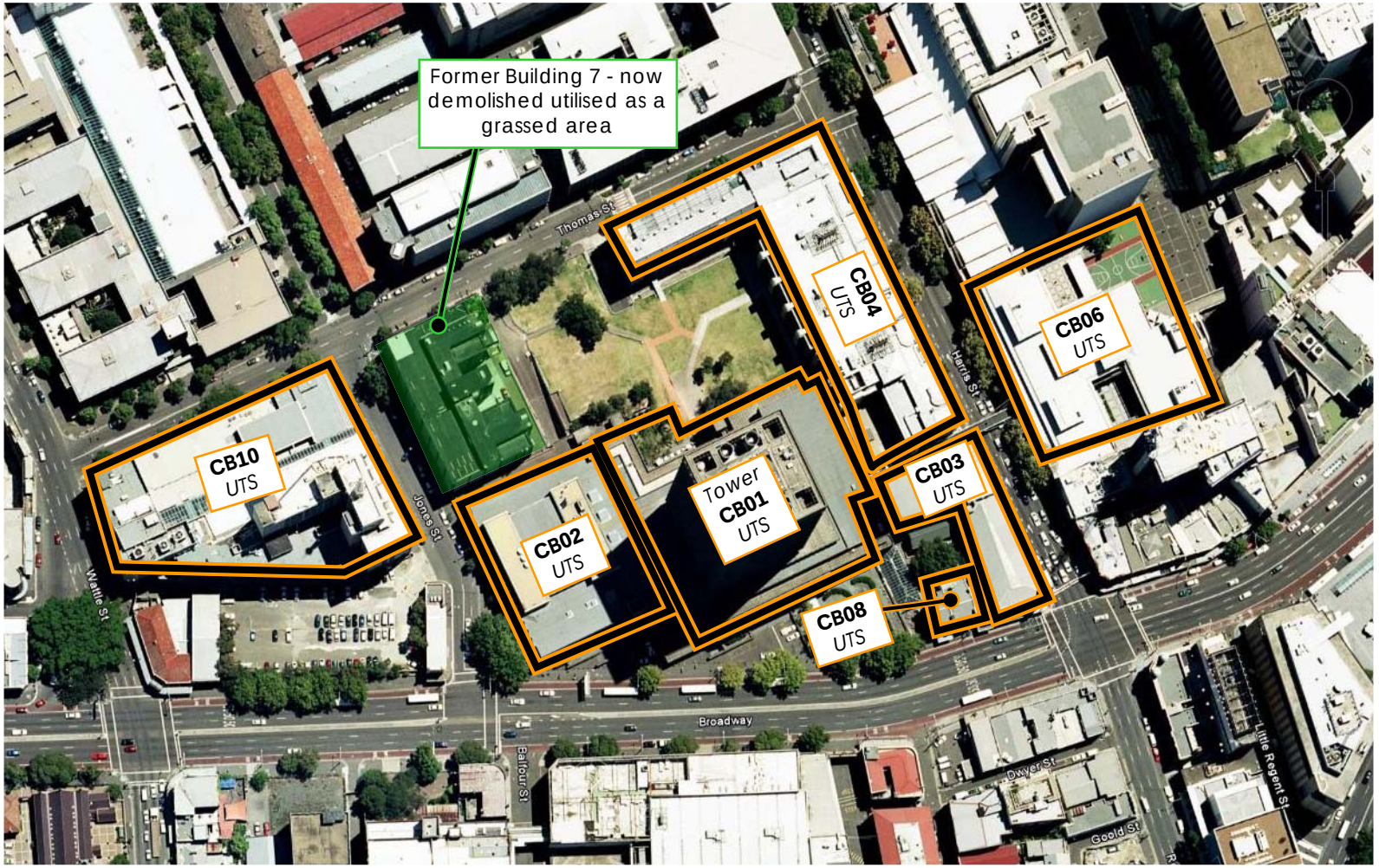


Halcrow MWT

Figure 1

EXISTING MAJOR ON-SITE USES

UTS TMAP



Halcrow MWT

Figure 2

Filename: 073588di32.ai

Date: 6 March 2009

EXISTING OFF STREET PARKING FACILITIES

UTS TMAP

Key

- Jones Street 'gravel' Carpark
  100 staff/public places
- Building 10 Basement Carpark
  155 staff/public spaces
- Building 1 Main Tower Carpark
  27 staff spaces
- Building 6 Basment Carpark
  135 staff spaces

Halcrow MWT

Figure 3

Filename: 073588di33.ai

Date: 6 March 2009

EXISTING LOADING DOCK LOCATIONS

UTS TMAP

Key

	2	Utility Vehicles/Vans
	0	MRV
	33	Utility Vehicles/Vans/SRV
	0	MRV
	3	Utility Vehicles/Vans/SRV
	1	MRV
	0	Utility Vehicles/Vans/SRV
	2	MR
	4	Utility Vehicles/Vans/SRV
	0	MRV

Halcrow MWT

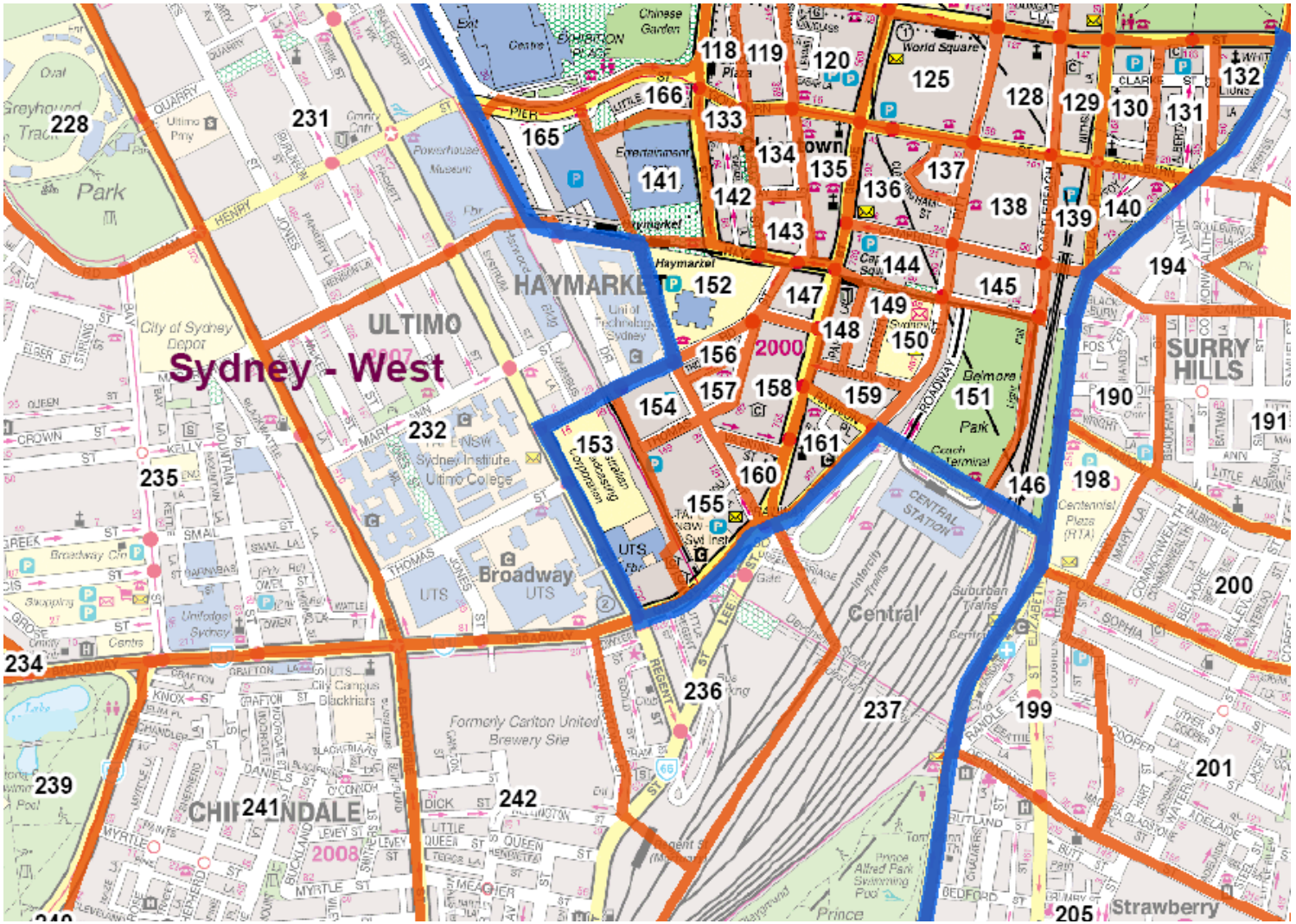
Figure 4

Filename: 073588di34.ai

Date: 6 March 2009

UTS TRAVEL ZONE BOUNDARY

UTS TMAP



Halcrow MWT

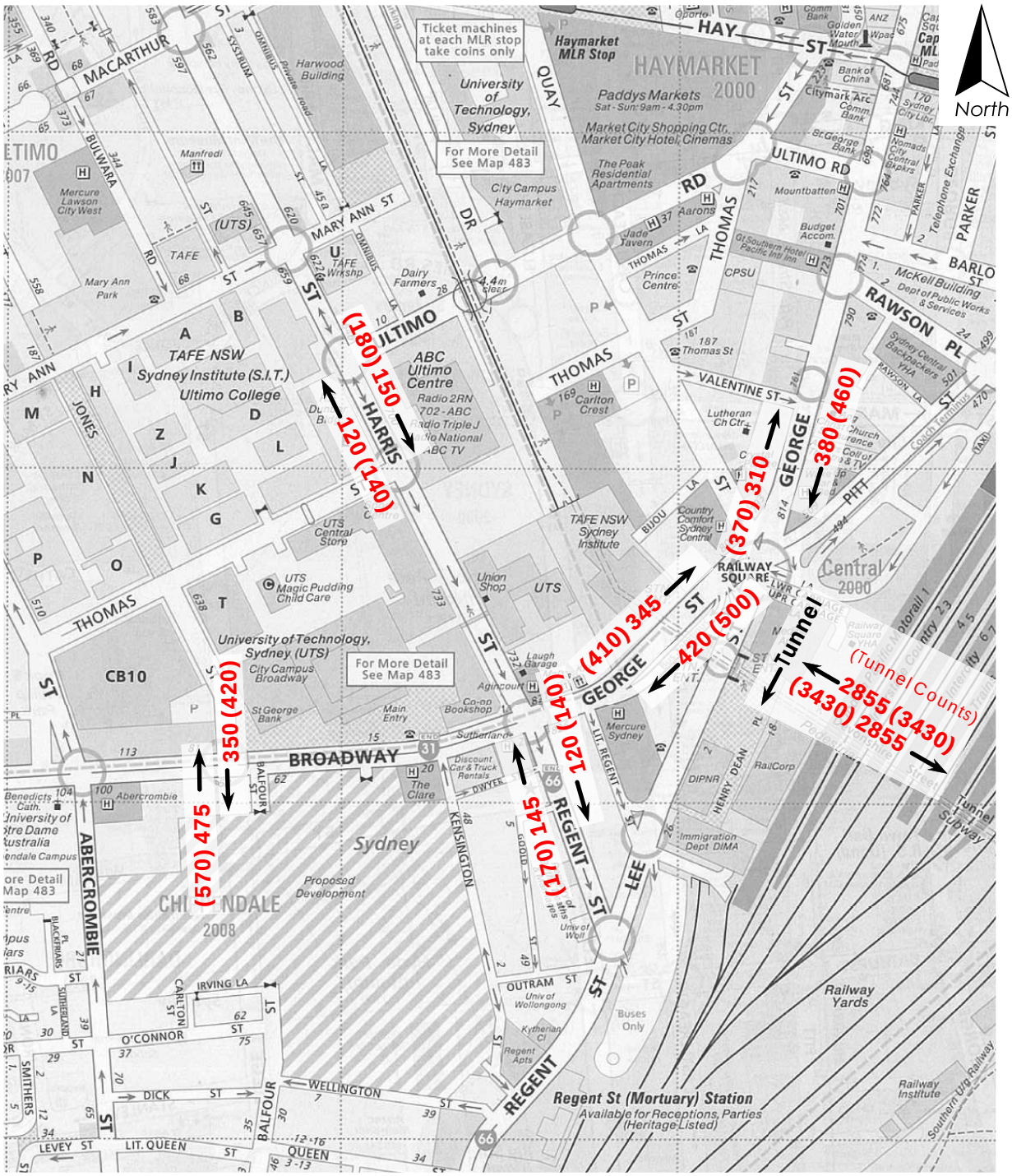
Figure 5

Filename: 073588di35.ai

Date: 6 March 2009

ESITMATED DAILY VOLUMES OF STUDENTS WALKING TO/FROM UNIVERSITY

UTS TMAP



Key

5: Existing

(5): Forecast

Halcrow MWT

Figure 6

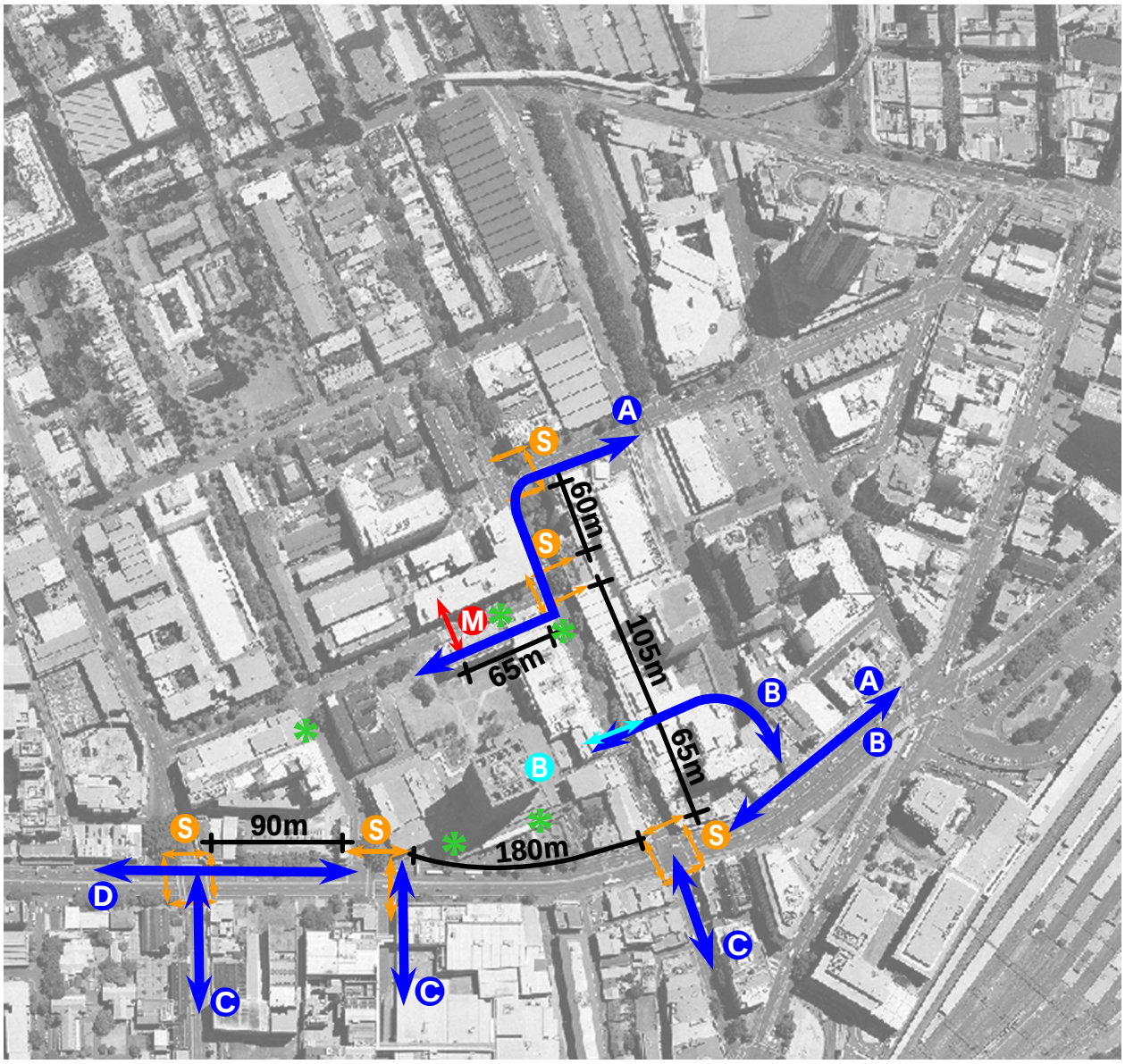
Filename: 073588di36.ai

Date: 28 April 2009

SPATIAL RELATIONSHIP OF EXISTING ACCESS AND PEDESTRIAN CROSSING FACILITIES

UTS TMAP

North



Key

- Pedestrian Facility
- S Signalised Pedestrian Crossing
- M Marked Crossing
- B Bridge
- Door Location

Major Pedestrian Development

- A To/From CBD
- B To/From Central Bus & Trains
- C To/From South
- D To/From West

MASSON | WILSON | TWINEY
TRAFFIC AND TRANSPORT CONSULTANTS

Figure 7

Filename: 073588di43.ai

Date: 9 April 2009

Appendix A Student Postcode Data Allocated to SLA

	# total students, current		
Suburb	Total	Bus	Rail
Botany Bay (C)	575	575	0
Randwick (C)	462	462	0
Baulkham Hills (A)	629	629	0
Hunter's Hill (A)	70	70	0
Lane Cove (A)	507	507	0
Manly (A)	150	150	0
Mosman (A)	183	183	0
Pittwater (A)	223	223	0
Warringah (A)	527	527	0
Woollahra (A)	413	330	83
Ryde (C)	632	506	126
Ashfield (A)	425	340	85
Canada Bay (A)	845	676	169
Leichhardt (A)	491	393	98
Marrickville (A)	556	445	111
Waverley (A)	427	0	427
Gosford (C)	181	0	181
Hawkesbury (C)	97	0	97
Hornsby (A)	1734	0	1734
Ku-ring-gai (A)	687	0	687
Lake Macquarie (C)	33	0	33
North Sydney (A)	381	0	381
Willoughby (C)	109	109	0
Wyong (A)	164	0	164
Hurstville (C)	731	0	731
Kiama (A)	14	0	14
Kogarah (A)	325	0	325
Shellharbour (C)	61	0	61
Sutherland Shire (A)	670	0	670
Wollongong (C)	117	0	117
Auburn (A)	608	0	608
Bankstown (C)	769	0	769
Blacktown (C)	835	0	835
Blue Mountains (C)	163	0	163
Burwood (A)	342	0	342
Camden (A)	36	0	36
Campbelltown (C)	130	0	130
Canterbury (C)	990	0	990
Fairfield (C)	982	0	982
Goulburn Mulwaree (A)	1	0	1

	# total students, current		
Suburb	Total	Bus	Rail
Liverpool (C)	599	0	599
Parramatta (C)	878	0	878
Penrith (C)	236	0	236
Rockdale (C)	487	0	487
Wingecarribee (A)	35	0	35
Wollondilly (A)	187	0	187
Sydney (C)	4045	0	0
Total	23742	6125	13572

Appendix B UTS Concept Plan

THOMAS STREET BUILDING:

NEW BUILDING FOR
EDUCATIONAL USES

ALUMNI GREEN:

BELOW GROUND
MULTI PURPOSE HALL.

BUILDING 4:

MINOR MODIFICATIONS TO EXISTING
BUILDING FOR GROUND LEVEL
CAFE OR RETAIL USES.

BUILDING 6:

EXTENSIONS AND MODIFICATIONS
TO EXISTING BUILDING

BUILDING 6:

NEW STUDENT ACCOMMODATION
TOWER

ALUMNI GREEN:

GROUND LEVEL LANDSCAPING
AND BELOW GROUND
BOOK STORAGE VAULT

BUILDING 10:

INTERNAL AND EXTERNAL
MODIFICATIONS TO INTEGRATE
WITH PROPOSED NEW
BROADWAY BUILDING

BUILDING 3:

MODIFICATIONS TO EXISTING BUILDING FOR
GROUND LEVEL CAFE OR RETAIL USES

BUILDING 1:

EXTENSION OF PODIUM TO
SOUTH TO CREATE NEW
ENTRANCE AND SCREEN NORTHERN
TERRACES.

BROADWAY BUILDING:

NEW BUILDING FOR
EDUCATIONAL USES

BUILDING 2:

EXTENSION TO AND REFURBISHMENT
OF EXISTING BUILDING 2

FRASERS SITE
SHOWN INDICATIVELY

PROPOSED NEW DEVELOPMENTS	PROPOSED GFA'S (m2)	
	STANDARD DEFINITION PRINCIPLE LEP	ULTIMO PYRMONT DEFINITION CITY OF SYDNEY LEP 2005
BUILDING 1	3,825	4,050
BUILDING 2	6,375	6,750
ALUMNI GREEN-BOOK STACK	2,250	2,250
ALUMNI GREEN-SPORTING FACILITIES	1,800	1,800
THOMAS STREET BUILDING	8,500	9,000
BROADWAY BUILDING	32,725	34,650
BUILDING 6-EXTENSION	5,550	5,950
BUILDING 6-TOWER	18,300	19,300

EXISTING BUILDINGS
PROPOSED DEVELOPMENTS
EXTENT OF SITE
BUILDINGS TO BE DEMOLISHED

24/03/2009

BVN BlighVollerNieldArchitecture

CLIENT: UNIVERSITY OF TECHNOLOGY SYDNEY

PROJECT: UTS BROADWAY CONCEPT PLAN

TRUE NORTH | PROJECT NORTH | GRAPHIC SCALE 0 20000 50000

SCALE: 1:2000 at A3

DRAWING: CAMPUS PLAN - PROPOSED

DRAWING NO: 3A-CP-02

Appendix C Increase in Student Rail Trips by Hour by Origin

Suburb	Bus/Rail	Direction	Total IN	Bus IN	Rail IN	Walk IN	Total OUT	Bus OUT	Rail OUT	Walk OUT
Botany Bay (C)	Bus	E	30	30	0	0	24	24	0	0
Randwick (C)	Bus	E	24	24	0	0	19	19	0	0
Baulkham Hills (A)	Bus	N	32	32	0	0	26	26	0	0
Hunter's Hill (A)	Bus	N	4	4	0	0	3	3	0	0
Lane Cove (A)	Bus	N	26	26	0	0	21	21	0	0
Manly (A)	Bus	N	8	8	0	0	6	6	0	0
Mosman (A)	Bus	N	9	9	0	0	8	8	0	0
Pittwater (A)	Bus	N	11	11	0	0	9	9	0	0
Warringah (A)	Bus	N	27	27	0	0	22	22	0	0
Woollahra (A)	Bus/Rail	E	21	17	4	0	17	14	3	0
Ryde (C)	Bus/Rail	N	32	26	6	0	27	21	5	0
Ashfield (A)	Bus/Rail	W	22	17	4	0	18	14	4	0
Canada Bay (A)	Bus/Rail	W	43	35	9	0	36	28	7	0
Leichhardt (A)	Bus/Rail	W	25	20	5	0	21	17	4	0
Marrickville (A)	Bus/Rail	W	29	23	6	0	23	19	5	0
Waverley (A)	Rail	E	22	0	22	0	18	0	18	0
Gosford (C)	Rail	N	9	0	9	0	8	0	8	0
Hawkesbury (C)	Rail	N	5	0	5	0	4	0	4	0
Hornsby (A)	Rail	N	89	0	89	0	73	0	73	0
Ku-ring-gai (A)	Rail	N	35	0	35	0	29	0	29	0
Lake Macquarie (C)	Rail	N	2	0	2	0	1	0	1	0
North Sydney (A)	Rail	N	20	0	20	0	16	0	16	0
Willoughby (C)	Rail	N	6	6	0	0	5	5	0	0
Wyong (A)	Rail	N	8	0	8	0	7	0	7	0
Hurstville (C)	Rail	S	38	0	38	0	31	0	31	0
Kiama (A)	Rail	S	1	0	1	0	1	0	1	0
Kogarah (A)	Rail	S	17	0	17	0	14	0	14	0
Shellharbour (C)	Rail	S	3	0	3	0	3	0	3	0
Sutherland Shire (A)	Rail	S	34	0	34	0	28	0	28	0

Suburb	Bus/Rail	Direction	Total IN	Bus IN	Rail IN	Walk IN	Total OUT	Bus OUT	Rail OUT	Walk OUT
Wollongong (C)	Rail	S	6	0	6	0	5	0	5	0
Auburn (A)	Rail	W	31	0	31	0	26	0	26	0
Bankstown (C)	Rail	W	39	0	39	0	32	0	32	0
Blacktown (C)	Rail	W	43	0	43	0	35	0	35	0
Blue Mountains (C)	Rail	W	8	0	8	0	7	0	7	0
Burwood (A)	Rail	W	18	0	18	0	14	0	14	0
Camden (A)	Rail	W	2	0	2	0	2	0	2	0
Campbelltown (C)	Rail	W	7	0	7	0	5	0	5	0
Canterbury (C)	Rail	W	51	0	51	0	42	0	42	0
Fairfield (C)	Rail	W	50	0	50	0	41	0	41	0
Goulburn Mulwaree (A)	Rail	W	0	0	0	0	0	0	0	0
Liverpool (C)	Rail	W	31	0	31	0	25	0	25	0
Parramatta (C)	Rail	W	45	0	45	0	37	0	37	0
Penrith (C)	Rail	W	12	0	12	0	10	0	10	0
Rockdale (C)	Rail	W	25	0	25	0	20	0	20	0
Wingecarribee (A)	Rail	W	2	0	2	0	1	0	1	0
Wollondilly (A)	Rail	W	10	0	10	0	8	0	8	0
Sydney (C)	Walk	Local	208	0	0	208	170	0	0	170
Total			**1219**	**314**	**697**	**208**	**998**	**257**	**571**	**170**

Appendix D Discussions with State Transit

UTS Masterplan STA Meeting Minutes

This file note summarises the minutes of a meeting held between the State Transit Authority and Halcrow MWT to discuss the proposed UTS Masterplan.

Attendees:

Brian Mander (BM)	State Transit Authority
Dean Brodie (DB)	Halcrow MWT
Tom Longworth (TL)	Halcrow MWT

Date
Friday 4 December 2008

Location
State Transit Authority Main Office – Strawberry Hills

Time
3:00pm

- DB provided an overview of the overall project.
- DB advised that the closure of Jones Street was supported by UTS and Frasers Broadway. However the UTS Masterplan did not rely on the closure to progress the masterplan.
- DB presented plans provided by Frasers Broadway for the reconfiguration of the road to provide right turn access into the Frasers Broadway site *(this site is located on the southern side of Broadway)* and right turn access into Wattle Street for buses should Jones Street be closed in the future.

- TL provided a summary of the key points of the DG requirements pertaining to transit analysis which will be included in the preparation of the Transport Management and Accessibility Plan (TMAP) report.
- TL summarised the proposed approach of the transit analysis.
- BM indicated the approach appeared at face value reasonable.

BM made the following comments on the proposal and opportunities for improvements as part of the redevelopment of the site.

- The redevelopment of the site enables the opportunity to 'clean up' areas which impact on buses along the frontage of the site including kerb realignment, removal of clutter and obstructions *along the footway*.

- BM expressed concerns with the design for the reconfiguration of Broadway as it assumed narrower lanes which should be avoided and a reduction in footpath width on the northern side of Broadway. DB advised that the design has yet to be submitted formally to the RTA for consideration.
- There are substantial pedestrian flows past the frontage of the site and footway width is an issues, especially with obstructions (shelters, trees, etc);
- The construction of the 'Broadway' building should include footpath widening to compensate the loss *of footway width* needed to provide the right turn bays into the Frasers site and Wattle Street by, utilising the development footprint.
- *Traffic* lanes *on Broadway* should be widened where possible and not narrowed.
- The closure of the *left turn* slip lane from Broadway to Wattle Street should be included in an overall package of improvements as part of the project or *some other form of treatment considered.*
- The closure of Jones Street and removal of the centre island on the northern side of the intersection of Broadway / Jones Street should enable some widening of lanes in this location, if a right turn is to be provided a\for westbound buses to turn right into Wattle Street.
- Consideration may be given to amalgamating the existing two bus stops *citybound* in Broadway to one stop on the *eastern* side of Jones Street.
- The redevelopment of the main *UTS* tower *building* and the construction of the Broadway building should include shelter which enables the opportunity for the removal of formalised bus shelters and in turn removes footpath obstructions, *yet provides shelter for pedestrians/intending passengers*.
- Any redevelopment should include footpath reconstruction in Broadway as currently it is in a state of disrepair.
- If the construction of the 'Broadway' building is completed prior to the closure of Jones Street, the building design should include provision of comparable shelter which currently exists on the *western* side of Jones Street.
- The power pole on the bend on the *western* side of Jones Street should be removed as part of the construction of the 'Broadway' building.
- *If* RT 501 *were re-routed* – could use Thomas St or Mary-Anne St in the future. In either case, new shelters etc should be provided as part of the re-routing. At this stage BM indicated that the preference of the STA would be that the 501 is not rerouted
- Capacity Analysis – assume growth of approx 1% pa, mostly in peaks; on buses - RT501 carries well – extra trips in AM *have been introduced*, and *are* well loaded of an evening (apart, *perhaps*, from Monday) – up to 10pm on Thursday. There are lots of opportunities to deal with additional demand.
- *Is there an opportunity to do something with Harris Street's approach to Broadway – could two way be considered between Pitt /Regent Street and Ultimo Road?*

The meeting closed at 4:30pm.