

Reference: #16S1024000

18 July 2016

University of Technology Sydney
PO Box 123
ULTIMO NSW 2007

Attention: Mr. Greg Moore (Senior Architect Policy Advisor)

Dear Greg,

RE: UTS CENTRAL, BROADWAY PRECINCT – RESPONSE TO QUERIES IN RELATION TO TRAFFIC AND PEDESTRIANS

The University of Technology Sydney (UTS) has submitted an application to the Department of Planning and Environment (DoPE) for a State Significant Development Application (SSDA) relating to the UTS Central Project at the UTS City Campus, Broadway Precinct (SSD 7382).

DoPE has reviewed the submission with consultation with the City of Sydney Council (CoS), Roads and Maritime Services (RMS) and Transport for NSW (TfNSW) and responded with a request for more information.

In this regard, GTA Consultants has reviewed DoPE's traffic and transport related queries and responded in the following table.

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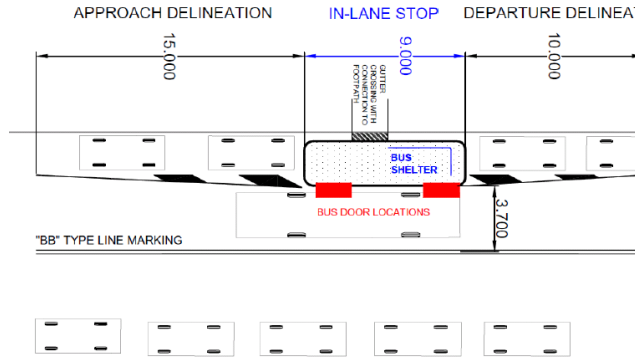
www.gta.com.au

No.	Key Issue Raised	Issued Raised By	GTA Response									
1	Urban Design The Department is concerned with the built form impacts on pedestrian movement around and through the site given the proposed minimal setback on Broadway. In this regard, additional information is sought regarding pedestrian movement and further demonstration that location of the bus stop will not interfere with pedestrian movement.	DoPE	A Pedestrian Capacity Assessment has been carried out at key locations along Broadway. The assessment is provided in Attachment 1.									
2	Pedestrian Link and Public Domain Interface The footpath adjacent UTS on Broadway is heavily congested by pedestrians and students. Concern is raised with the proposal further impacting upon overcrowding and public pedestrian safety. In this regard, the proponent should provide pedestrian movement modelling indicating the existing and proposed conditions with the view to increasing the pedestrian level of comfort. Informed by the modelling, the proponent should consider relocating the bus stop further west to avoid street furniture, trees and obstacles. This will allow for a generous waiting area that does not impede pedestrian flows. The building entry and perimeter adjacent the Jones Street intersection should be level with the pavement to improve building permeability and reduce overcrowding. A wider pavement should be provided at this point to accommodate people waiting at the signalised intersection and allow for better pedestrian flow.	CoS	A Pedestrian Capacity Assessment has been carried out at key locations along Broadway. The assessment is provided in Attachment 1.									
3	Pedestrian/Cyclist Amenity Upgraded bus stop facilities must be provided on Broadway. This should include wayfinding signage to and from key sites such as Central Station, the Goods Line and Darling Harbour. Cycle rails should be integrated into the design of any steps or changes in level.	CoS	N/A.									
4	Bicycle Parking and End of Trip Facilities (EOTF) Additional bicycle spaces and EOTF are required. This is of particular importance given the recent growth of cycleways in the CBD. EOTF should be located on ground floor or basement level 1 in a separate location to the visitor parking area. The minimum number of bicycle parking spaces and EOTF to be provided for the development should comply with the table below: <table><tr><td>Bicycle Parking type</td><td>Number</td><td>Requirements</td></tr><tr><td>Staff</td><td>52</td><td>Spaces must be Class 2 bicycle facilities</td></tr><tr><td>Student</td><td>473</td><td>Spaces must be Class 2 or 3 bicycle facilities</td></tr></table>	Bicycle Parking type	Number	Requirements	Staff	52	Spaces must be Class 2 bicycle facilities	Student	473	Spaces must be Class 2 or 3 bicycle facilities		The bicycle parking provision for the UTS City Campus, as determined in the UTS City Campus Bicycle Strategy is 1,008 bicycle spaces. The bicycle strategy utilised CoS's DCP requirements for bicycle parking which stipulates a rate of 1 space per 10 students and staff. As part of the gradual implementation of the strategy, new, high quality bicycle parking facilities have been provided in the Building 10 car park (adjacent to the subject site) accommodating 288 bicycle parking spaces, 260 lockers, 14 toilets and 28 male and female showers. However, frequent surveys of bicycle parking occupancy indicate that demand for bicycle parking has not increased following an increase in bicycle parking supply and in 2015 was on average 33 per cent occupied and the demand bicycle parking rate was
Bicycle Parking type	Number	Requirements										
Staff	52	Spaces must be Class 2 bicycle facilities										
Student	473	Spaces must be Class 2 or 3 bicycle facilities										

No.	Key Issue Raised			Issued Raised By	GTA Response
	End of Trip Facility Type	Number			surveyed to be two spaces per 100 students/staff on site. Given the low demand for bicycle parking, additional parking provision from the UTS City Campus Bicycle Parking Strategy is not deemed to be necessary at this point. Instead, UTS intends to continue monitoring of its bicycle parking demand and provide additional parking as required. This monitoring and management of UTS bicycle parking is to be carried out by UTS's Sustainability Group. Further details of the UTS's bicycle parking provision (including parking occupancy surveys between 2013 and 2015), is provided in GTA's <i>Broadway Precinct – UTS Central, Transport Impact Assessment</i> dated 27 April 2016.
	Staff Showers with Change Area	7			
	Staff Personal Lockers	52			
	Student Showers with change area	27			
	Student Personal Lockers	270			
	Note: Australian Standard AS 2890.3:2015 refers to class 1 as class 'A', class 2 as class 'B', and class 3 as class 'C' A reduction in the quantity of visitor bicycle parking may be acceptable if an increase in the overall quality of parking facilities is provided. Innovative bicycle parking solutions in new developments include: • A range of Class 2 and 3 visitor parking facilities; • Provision of a bicycle share, hire and shop area; and • Air compressors for tyre inflation, filtered water, bicycle service rack & tool kit, communal bicycle tools, tune up and repair service, drying rack, complementary towel services, iron services, etc.				
5	North South Cyclist/Pedestrian Linkages Provisions for improved north-south cyclist/pedestrian connections should be considered, including: • Pedestrianisation of Jones Street (Thomas Street to Broadway); • Separated cycleway on the southern side of Mary Ann Street (Jones Street to the Goods Line); and • Widening of the pedestrian way/shared path on the footway along Broadway.			CoS	N/A
6	Sustainable Transport The proponent should provide analysis of the projected public transport modal splits and how these will be achieved. The targets must be reflected in the targets of the Green Travel Plan. More specifically, the development should seek to encourage Sustainable Transport in a manner which aligns with the targets and objectives set out in Sustainable Sydney 2030.			CoS	A Green Travel Plan has been prepared for the site. The plan aligns with the targets and objectives set out in Sustainable Sydney 2030. The Green Travel Plan is provided in Attachment 2.

No.	Key Issue Raised	Issued Raised By	GTA Response
7	Green Travel Plan A Green Travel Plan is required to demonstrate that the site will encourage a modal shift away from car use in favour of Sustainable Transport options such as walking, cycling and public transport. The Green Travel Plan should include a Transport Access Guide.	CoS	A Green Travel Plan with an associated Transport Access Guide has been prepared for the site. The Green Travel Plan is provided in Attachment 2.
8	Construction The preparation of a Construction Pedestrian and Traffic Management Plan (CPTMP) in consultation with Council and the CBD Co-ordination Office within TfNSW and Sydney Light Rail Team, will be crucial to addressing efficient functioning of business in the area surrounding the site. Several construction projects including the Sydney Light Rail Project are likely to occur at the same time as this development within the CBD. The cumulative increase in construction vehicle movement from these projects could have the potential to impact on general traffic and bus operations in the CBD, as well as pedestrians and cyclists particularly during commuter peak periods.		Contractor will coordinate with the CBD Coordination Office and Sydney Light Rail Team and provide a Construction Pedestrian and Traffic Management Plan.
9	Servicing A revised Loading Management Plan should be provided to demonstrating how the dock will be managed.		Vehicle access and servicing arrangements will be as per existing and as such would operate satisfactorily.
10	Complying with AUSTROADS The swept path of the longest vehicle (to service the site) entering and exiting the subject site, as well as manoeuvrability through the site, shall be accordance with AUSTROADS. In this regard, a plan shall be submitted to Roads and Maritime and CBD Coordination Office for approval, which shows that the proposed development complies with this requirement.	RMS	Vehicle access and servicing arrangements will be as per existing and as such would operate satisfactorily.
11	Construction Traffic Management i The Construction Traffic Management Plan (CTMP) proposes to reopen Jones Street to left in movements to allow access to the phase one construction site. Due to this arrangement, vehicles accessing the site may impact on bus services operating along Broadway, which is a key bus corridor into and out of the CBD. TfNSW requests that the applicant work with the CBD Coordination Office and RMS to determine appropriate access arrangements to the site, which minimise the impact on bus services. ii The applicant has provided limited information on the construction details during phase 2 of the works. The utilisation of the existing footpath area and the UTS shuttle bus area in front of Building 1 during phase 2 works is likely to have a significant	TfNSW	i Contractor will coordinate with the CBD Coordination Office and RMS to determine appropriate access arrangements to the site. ii A Construction Management Plan (CMP) for Phase 2 has been prepared by Richard Crookes (2016). The CMP indicates that the occupation of the existing footpath will located to the west of the existing bus stop and would maintain room for bus operation. The minimum kerb room for bus operation is to be 9m as recommended by the Bus Infrastructure Guidelines ¹ , as shown in the following figure.

¹ State Transit, July 2011, Bus Infrastructure Guide, Issue 2, Revision 1.0

No.	Key Issue Raised	Issued Raised By	GTA Response
	impact on pedestrians and bus customers. TfNSW requests that further details on the construction management and assessment of the construction staging, access, impact and the development of mitigation measures during the phase 2 works be undertaken. - iii During stage 6 of the construction works it is estimated that 110 truck movements per day are expected to occur. This is may have a significant impact on the operation of the transport network. Further assessment of the impact, including traffic modelling, of the construction vehicles accessing the site should be undertaken and mitigation measure identified. TfNSW requests that safe access for pedestrian and cyclists should be maintained throughout all stages construction - iv Swept path analysis for all vehicles accessing the construction site should be provided for both phase 1 and phase 2 in the CTMP. - v Several construction projects, including the Sydney Light Rail Project are likely to occur at the same time as this development within the CBD. The cumulative increase in construction vehicle movements from these projects could have the potential to impact on general traffic and bus operations within the CBD, as well as the safety of pedestrians and cyclists particularly during commuter peak periods.		 The proposed layout of Phase 2 construction site is provided in Attachment 3. - iii 110 truck movements per day is equivalent to 11 or 12 vehicles per hour or 2 vehicles every 10 minutes. This would be less than 1% of the volume carried by Broadway². This volume is considered to be low, as such it would not have adverse impact to the existing network. - iv Swept path analysis for Phase 1 has been carried out as part of the Traffic Management Plan and is provided in Attachment 4. A swept path assessment and an updated CMP should be carried out prior to the commencement of Phase 2 works. - v While the volume of construction traffic is to increase in the surrounding road network, general traffic is anticipated to reduce as a result of road closures associated with the Sydney Light Rail project. Additionally, the 12 vehicles per hour is considered to be low. As such, the construction from the proposed development is not expected to impact general traffic movements. A vehicle access strategy has been prepared to reduce impact to buses, pedestrians and cyclists, and is provided in Attachment 4. The strategy includes a one-way, entry access

² Based on 2005 Roads and Maritime Services (RMS) 2005 Annual Average Daily Traffic Data (AADT) which states a volume of 72,000 vehicles per day on Broadway

No.	Key Issue Raised	Issued Raised By	GTA Response
			into the construction zone to promote efficient vehicle circulation and a controlled pedestrian management plan at the access.
12	Pedestrian Assessment The pedestrian movements generated by the proposed development may impact on the pedestrian amenity and cause capacity issues. In addition to the pedestrian safety assessment included in the TIA, TfNSW requests that an assessment of the impact of the additional pedestrian movements on the surrounding pedestrian infrastructure be undertaken.	TfNSW	A Pedestrian Capacity Assessment has been carried out at key locations along Broadway. The assessment is provided in Attachment 1.

I trust the above is satisfactory. Naturally, should you have any questions or require any further information, please do not hesitate to contact me or Bernard Lo in our Sydney office on (02) 8448 1800.

Yours sincerely

GTA CONSULTANTS



Nicole Vukic
Associate Director

encl.

Attachment 1 – Pedestrian Capacity Assessment

Attachment 2 – Green Travel Plan

Attachment 3 – Phase 2 Construction Site Layout

Attachment 4 – Access Arrangements

Attachment 1

Pedestrian Capacity Assessment

Reference: #16S1024000

15 July 2016

University of Technology Sydney
PO Box 123
ULTIMO NSW 2007

Attention: Mr. Greg Moore (Senior Architect Policy Advisor)

Dear Greg,

RE: UTS – BROADWAY FOOTPATH CAPACITY ASSESSMENT

Background

GTA Consultants (GTA) prepared a Traffic Impact Assessment (TIA) report (dated 27 April 2016) further to the submission of the State Significant Development Application (SSD7382) to the NSW Department of Planning and Environment (DoPE). The SSD application relates to the proposed redevelopment and expansion of an existing building of the University of Technology, Sydney (UTS).

As part of the SSD application review process, DoPE has consulted with City of Sydney (CoS) and Transport for NSW (TfNSW). In addition to the TIA, it was subsequently requested by the DoPE and TfNSW that a more detailed Broadway footpath capacity assessment following development of the campus UTS Central Project is provided to supplement the assessment of the proposal.

Specifically, in their respective assessment the DoPE and TfNSW provided the following comments:

Urban Design (DoPE)

The Department is concerned with the built form impacts on pedestrian movement around and through the site given the proposed minimal setback on Broadway. In this regard, additional information is sought regarding pedestrian movement and further demonstration that location of the bus stop will not interfere with pedestrian movement.

Pedestrian Assessment (TfNSW)

The pedestrian movements generated by the proposed development may impact on the pedestrian amenity and cause capacity issues. In addition to the pedestrian safety assessment included in the TIA, TfNSW requests that an assessment of the impact of the additional pedestrian movements on the surrounding pedestrian infrastructure be undertaken.

In response to the request GTA Consultants prepared the following Pedestrian Capacity Assessment.

The assessment focuses on the Broadway footpath as previous pedestrian data indicated that pedestrian flows on Broadway have been consistently higher than any other footpaths in the vicinity of the UTS campus. In relative terms, the data indicates that pedestrian flows along

footpaths at Jones Street, Thomas Street and Harris Street have been approximately 30% of that at Broadway.

Accordingly, the following assessment discusses the critical footpath capacity at Broadway (i.e. study area) with respect to existing and post development circumstances.

Assessment Methodology

To understand whether there is adequate capacity in the study area surrounds to cater for existing pedestrian demands while ensuring the safety and convenience for pedestrians, GTA Consultants used Fruin Theory¹, which is reproduced in the '*Transit Capacity and Quality of Service Manual – 2nd Edition – Part 7*'² and involves evaluating the pedestrian capacity and level of service (LOS) of an area.

To assess pedestrian LOS, GTA Consultants adopted the criteria of 'Transport for London'. Pedestrian flow rate, measured in pedestrians per metre per minute, is the number of pedestrians that pass a point during a specific period of time.

Table 1 presents the LOS criteria based on 'Pedestrian Flow Rate' and Figure 1 presents a graphical representation of the walkway LOS.

While there have been no specific minimum criteria from which appropriate LOS for footpaths are designed against, footpaths in popular pedestrian areas are generally recommended to be designed to LOS C.

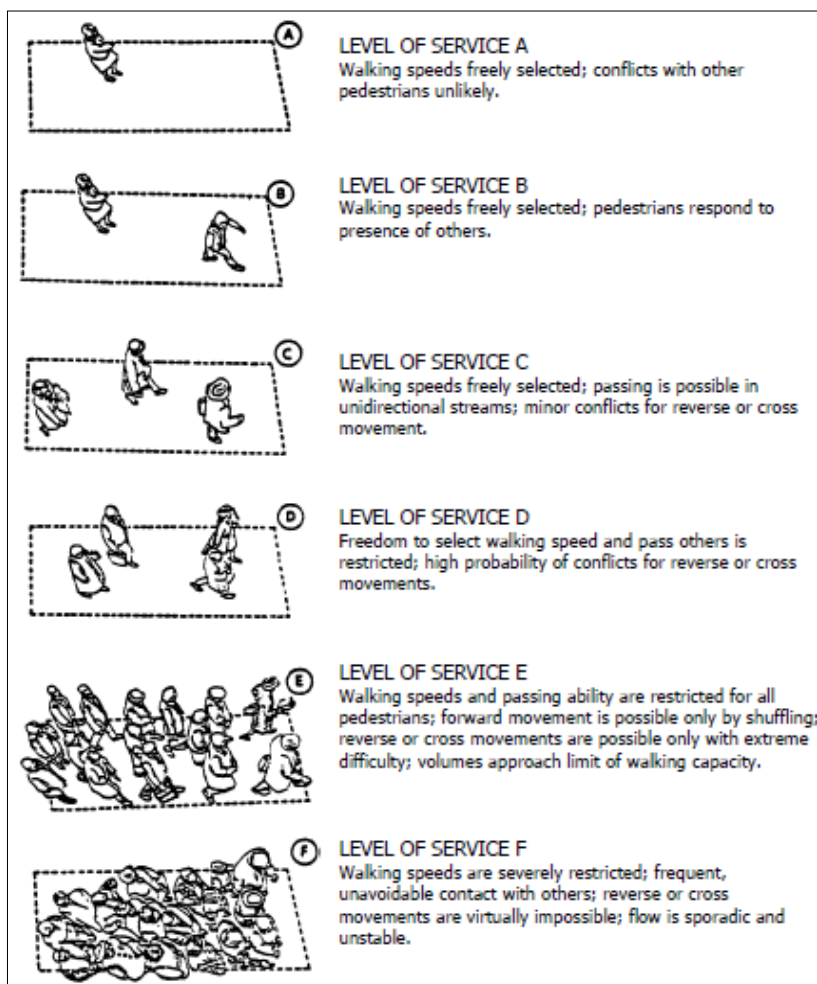
Table 1: Pedestrian Level of Service on Walkways

LOS	Flow rate (ped/min/m)	
	From	To
LOS A	0	8
LOS B	9	17
LOS C	18	26
LOS D	27	35
LOS E	36	+

¹ Fruin, John J. 1987 *Pedestrian Planning and Design – Revised Edition*

² Transportation Research Board 2003 *Transit Capacity and Quality of Service Manual – 2nd Edition – Part 7*

Figure 1: Illustration of Fruin Theory Walkway Levels of Service³



Source: Transportation Research Board 2003 Transit Capacity and Quality of Service Manual – 2nd Edition – Part 7

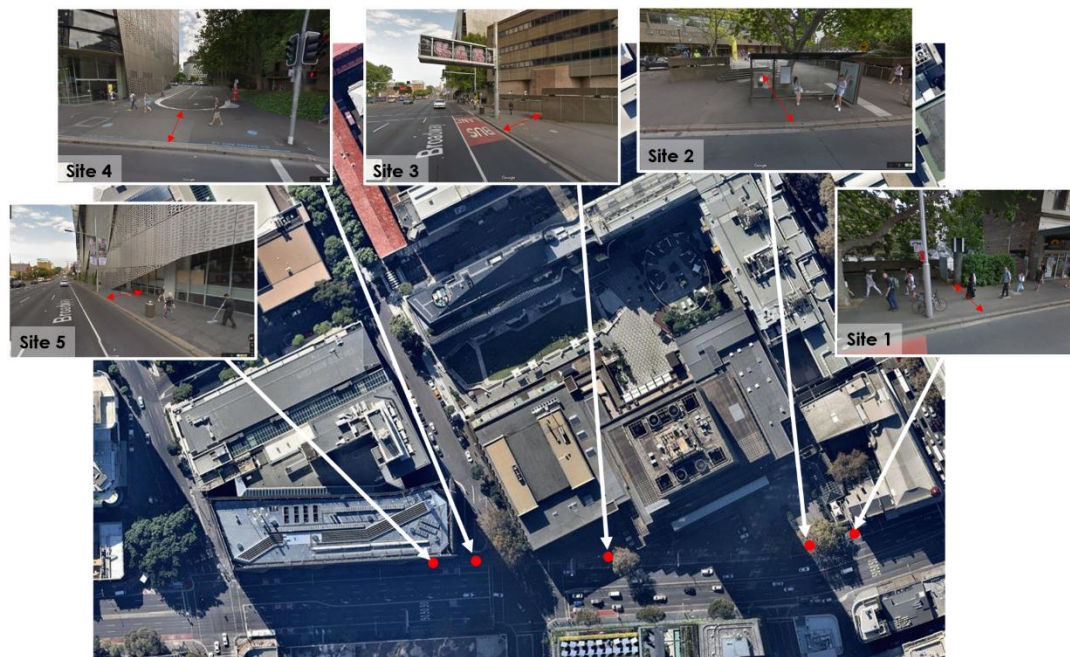
Critical Footpath Locations (Sites)

To gain an understanding of the footpath circumstances five representative sites have been selected to form a basis of determining existing footpath capacity at Broadway. Consideration for 'candidate' sites must have regard for surrounding physical obstructions such as seating, bus stops and trees etc. This is because GTA deems it prudent transport planning to assess available capacity based on the narrowest point, in order to provide the most conservative assessment outcome.

Figure 2 indicate the locations of the five sites that have been selected for the purpose of this assessment.

³ Fruin, John J. 1987 *Pedestrian Planning and Design – Revised Edition*

Figure 2: Site locations



Source: Google Maps

Existing Footpath Capacity (2016)

Pedestrian volume data along Broadway has been obtained from the report “*UTS Magnetic South, Movement & Unscheduled Activity*” by Gehl Architects in 2013. The report indicated approximately 21,000 pedestrians per day (ppd), including students and general public alike, walking on the Broadway footpath during a typical full semester day. It is understood there were approximately 17,100⁴ equivalent full time student load (EFTSL) enrolled at the University in 2014 and that by 2020 it is anticipated to grow by 14%. This is equivalent to student growth of some 2.5% per annum. If it is assumed that the Broadway pedestrian growth rate is 5% per annum to account for non-student pedestrian activities, then the projected 2016 pedestrian flows on Broadway would likely be 24,150 pedestrians.

While a typical ‘day’ at a university precinct such as the subject site is generally 12 hours, GTA Consultants adopted an 8-hour day to assess the footpath capacity. With these parameters the existing footpath operation was assessed using the Fruin Theory. A summary of the assessment is provided in Table 2.

⁴ UTS Modification Building 2 - Social Impact Statement, Hill PDA Consulting, July 2015

Table 2 Existing Footpath Capacity

Site	1	2	3	4	5
Pedestrians /day	21,000	21,000	21,000	21,000	21,000
Growth to 2016	15%	15%	15%	15%	15%
Pedestrians /day in 2016	24150	24150	24150	24150	24150
Pedestrians /hour ^[1] in 2016	3019	3019	3019	3019	3019
Pedestrians /min	50	50	50	50	50
Footpath Width ^[2]	3	6	3.4	5.5	4
Effective Footpath Width ^[2]	3	2.5	3.4	5.5	3.5
Ped/min/m	17	20	14	9	14
LOS	B	C	B	A	B

[1] Pedestrians/ hour is calculated assuming an 8-hour day

[2] Footpath widths are an approximation determined using aerial photography

Table 2 indicates that the Broadway footpath near the University frontage is likely operating at a level of service (LoS) B or better, with the exception of Site 2, i.e. near the bus stop.

Site 2 is operating at LoS C due to physical obstructions on the footpath, such as the tree and the bus shelter.

Notwithstanding, as discussed above, footpath levels of service of C or better is deemed satisfactory from a walking comfort point of view.

Forecast Pedestrian Demand (2020)

As previously indicated, the campus population was 17,100 EFTSL in 2014.

By the same principles, an annual growth rate of 5% would result in a projection of some 26,250 pedestrians on the Broadway footpath in 2020.

Again, based on a conservative 8-hour day, this is equivalent to a projected footpath demand of some 3,544 pedestrians per hour.

Based on the above, the projected footpath operation has been assessed and is summarised in Table 3.

Table 3 Projected Footpath Assessment

Future – 2020					
Site	1	2	3	4	5
Pedestrians /day	21,000	21,000	21,000	21,000	21,000
Growth to 2020	35%	35%	35%	35%	35%
Pedestrians /day in 2020	28350	28350	28350	28350	28350
Pedestrians /hour ^[1] in 2020	3544	3544	3544	3544	3544
Pedestrians /min	59	59	59	59	59
Footpath Width ^[2]	3	6	3.4	5.5	4
Effective Footpath Width ^[2]	3	2.5	3.4	5.5	3.5
Pedestrians /min /m	20	24	17	11	17
LOS	C	C	B	B	B

[3] Pedestrians/ hour is calculated assuming an 8-hour day

[4] Footpath widths are an approximation determined using aerial photography

The findings of the assessment, as apparent from Table 3, indicate that the footpath, in its existing geometries, will likely operate at LoS C at sites 1 and 2 and LoS B at sites 3, 4 and 5.

Summary

The above assessment suggests that the Broadway footpath, when based on conservatively projected growth, will likely carry some 24,000 ppd at present. By the same principles, it is anticipated that by 2020 Broadway would carry some 26,000 ppd.

The assessment reveal that the fronting footpath is operating with no capacity constraint at present, and will likely continue to operate at satisfactory levels of service (i.e no worse than LoS C) under the projected growth in 2020.

Further, it is understood that the proposed UTS redevelopment includes the widening of the existing footpath by 1.5 metres at the frontage of Building 1 and Building 2. That is, Sites 2 and 3 will improve in capacity to LoS B under the projected future conditions, assuming that bus stops, trees and street furniture remain at existing locations.

In addition, the proposed redevelopment does not seek to reduce any effective footpath capacity at Broadway. On this basis, it is considered that the proposed redevelopment works will not likely to have adverse implications on the Broadway footpath capacity.

I trust the above assessment is sufficient for your requirements. Naturally, should you have any questions or require any further information, please do not hesitate to contact me in our Sydney office on (02) 8448 1800.

Yours sincerely

GTA CONSULTANTS



Nicole Vukic
Associate Director

Attachment 2

Green Travel Plan



University of Technology, Sydney Broadway Precinct - UTS Central Green Travel Plan

Client //	University of Technology, Sydney
Office //	NSW
Reference //	16S1024000
Date //	15/07/16

University of Technology, Sydney

Broadway Precinct - UTS Central

Green Travel Plan

Issue: A 15/07/16

Client: University of Technology, Sydney

Reference: 16S1024000

GTA Consultants Office: NSW

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	15/07/16	Final	Oasika Faiz	Nicole Vukic	Nicole Vukic	N.Vukic



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Gold Coast | Townsville

Table of Contents

1. Introduction	1
2. Green Travel Plan	2
3. Existing Transport Conditions	3
3.1 Bus Network	3
3.2 Rail Network	3
3.3 Light Rail	4
3.4 Pedestrian Infrastructure	4
3.5 Cycle Infrastructure	5
3.6 Local Car Sharing Initiatives	7
3.7 Travel Mode Share	8
4. Methods of Encouraging Modal Shift	10
4.4 Green Travel Plan Information	12
4.5 Information and Communication	13
5. Management of the Plan	14
5.1 Monitoring	14
5.2 Monitoring Milestones	14
5.3 Remedial Actions	15
6. Summary	16

Appendices

A: Transport Access Guide

Figures

Figure 3.1:	UTS Campus hubs and pedestrian network	5
Figure 3.2:	Cycle network	6
Figure 3.3:	Building 10 bicycle parking	7
Figure 3.4:	Car sharing pods	7
Figure 3.5:	Travel Zone 159	8

Tables

Table 3.1:	Bus frequency comparison of bus stops on Broadway	3
Table 3.2:	Number of rail services at the peak hours	4

Table 3.3:	Journey to work comparison	8
Table 3.4:	UTS student and staff mode share	9

1. Introduction

The University of Technology Sydney (UTS) has lodged an application to the Department of Planning and Environment (DoPE) for a State Significant Development (SSD 7382). The development relates specifically to the extension of Building 1 (podium) and redevelopment of Building 2 at the City Campus, Broadway Precinct.

DoPE has provided a *Response to Submissions* requesting the preparation of a Green Travel Plan. The response is as follows:

Sustainable Transport

The proponent should provide analysis of the projected public transport modal splits and how these will be achieved. The targets must be reflected in the targets of the Green Travel Plan. More specifically, the development should seek to encourage Sustainable Transport in a manner which aligns with the targets and objectives set out in Sustainable Sydney 2030.

In this regard, GTA Consultants (GTA) has prepared the following Green Travel Plan to address the above response from DoPE.

It is recognised that the proposed development will attract largely two different groups of people – staff and students. As such this Green Travel Plan is geared towards staff and students, to encourage reduced private vehicle travel and adoption of more sustainable travel modes.

2. Green Travel Plan

2.1 What is a Green Travel Plan?

A Green Travel Plan is a package of measures aimed at promoting sustainable travel and reducing reliance on the private car. It is not designed to be 'anti-car', but will encourage and support people's aspirations for carrying out their daily business in a more sustainable way. Travel plans can provide both:

- Measures which restrict car use (disincentives or 'sticks')
- Measures which encourage or support sustainable travel, reduce the need to travel or make travelling more efficient (incentives or 'carrots').

The travel plan would promote the use of transport, other than the private car, provide choice for staff to travel to and from the site, which is more sustainable and environmentally friendly.

Indeed, there are a range of 'non-car' transport options that are available at the site, which have been described in this report.

Given the subject development does not include any additional parking provision, the implementation of a Green Travel Plan would be beneficial. At the same time, it is noted that the limited parking provisions at the UTS Campus and surrounding areas will act to encourage the use of sustainable transport as an alternative to car use and would help support the objectives of a Green Travel Plan.

2.2 Key Objectives

The aim of the Green Travel Plan is to bring about better transport arrangements for working at the site. The key objectives of the Green Travel Plan are to:

- Encourage walking
- Encourage cycling
- Encourage the use of public transport
- Reduce the use of the car, in particular single car occupancy
- Where it is necessary, use the car, but encourage more efficient use.

It is the intention therefore that the Green Travel Plan will deliver the following benefits:

- Enable higher public and active transport mode share targets to be achieved
- Contribute to greenhouse gas emission reductions and carbon footprint minimisation
- Contribute to healthy living for all
- Contribute to social equity and reduction in social exclusion
- Improve knowledge and contribute to learning.

3. Existing Transport Conditions

The site benefits from an extensive availability of public transport options, with Central Transport Interchange located within 600 metres (equating to a seven-minute walk) to the east.

3.1 Bus Network

The subject site is located in close proximity to several key bus corridors including Broadway along the southern boundary of Buildings 1 and 2.

Central Transport Interchange features five main bus hubs at Railway Square (200 metres east of the site), George Street, Eddy Avenue and Chalmers Street. The hubs serve destinations across the Sydney Metropolitan Area including Sydney's south, eastern suburbs, inner-west, northern beaches and north-west.

The nearest bus stop to the site is located immediately in front of Building 1 on Broadway. This stop is served by 19 services within the Sydney Buses network and is a major inbound stop in the area. Corresponding outbound bus services from UTS is available from Railway Square, which is approximately 200 metres to the east of Building 1.

The current bus frequencies of bus stop on Broadway, nearest to the UTS site, is summarised in Table 3.1.

Table 3.1: Bus frequency comparison of bus stops on Broadway

Period	Inbound	Outbound	Total
AM Peak (8am – 9am)	126	70	196
PM Peak (5pm – 6pm)	78	99	177

Source: www.transportnsw.info, accessed November 2015

3.2 Rail Network

Central Railway Station serves as the key rail hub in Sydney for CityRail services to destinations across the Sydney Metropolitan Area, the Illawarra, Blue Mountains and Central Coast. Central Station is also the hub for interstate rail services in Sydney.

Table 3.2 summarises the frequency of rail services to and from Central Station.

Table 3.2: Number of rail services at the peak hours

Rail line	AM (8am - 9am)		PM (5pm – 6pm)	
	To City	From City	To City	From City
T1 North Shore and Northern Line	19	20	20	16
T1 Western Line	20	20	14	19
T2 Airport Line	14	8	8	12
T2 Inner West and South Line	12	8	8	11
T3 Bankstown Line	8	6	6	8
T4 Eastern Suburbs and Illawarra Line	12	16	17	18
T6 Carlingford Line	2	1	2	2
Blue Mountains Line	4	1	2	4
Central Coast and Newcastle Line	8	2	2	7
South Coast Line	4	1	3	4
Southern Highlands Line	4	1	4	3
Total	107	84	86	104

3.3 Light Rail

The Central Transport Interchange is also the main terminus for the Central to Dulwich Hill light rail network.

Light rail services generally operate every 15 minutes during the off-peak periods and every 10 minutes during the peak periods (i.e. 7am to 10am and 3pm to 6pm). Services operate between Central and Dulwich Hill for the hours between 6am and 11pm from Saturday to Thursday and between 6am and midnight on Friday and Saturday.

3.4 Pedestrian Infrastructure

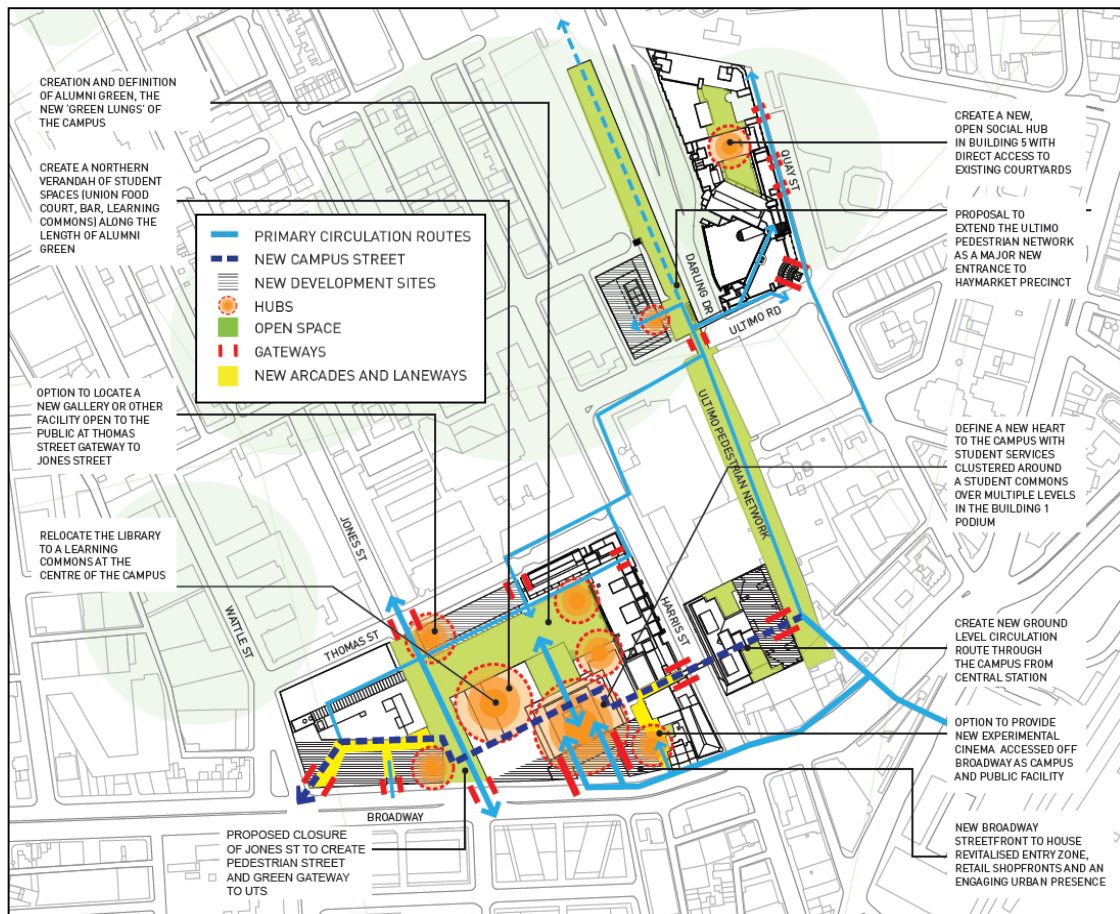
The pedestrian network surrounding the site is well established with pedestrian paths located on both sides of the surrounding roads.

Formal pedestrian crossing points in vicinity of the site are provided at the following locations:

- Two pedestrian crossings at the frontage of Building 2 of the Chippendale Way/ Broadway intersection
- All legs of the George Street/ Harris Street/ Regent Street intersection.

Within the campus, UTS has proposed and implemented several pedestrian links as part of the original City Campus Masterplan to enable the connection of key hubs across its City Campus. The masterplan included the plan to close Jones Street to vehicular traffic from Broadway, which has been implemented. The pedestrian network that was proposed as part of the original City Campus Masterplan is shown in Figure 3.1.

Figure 3.1: UTS Campus hubs and pedestrian network

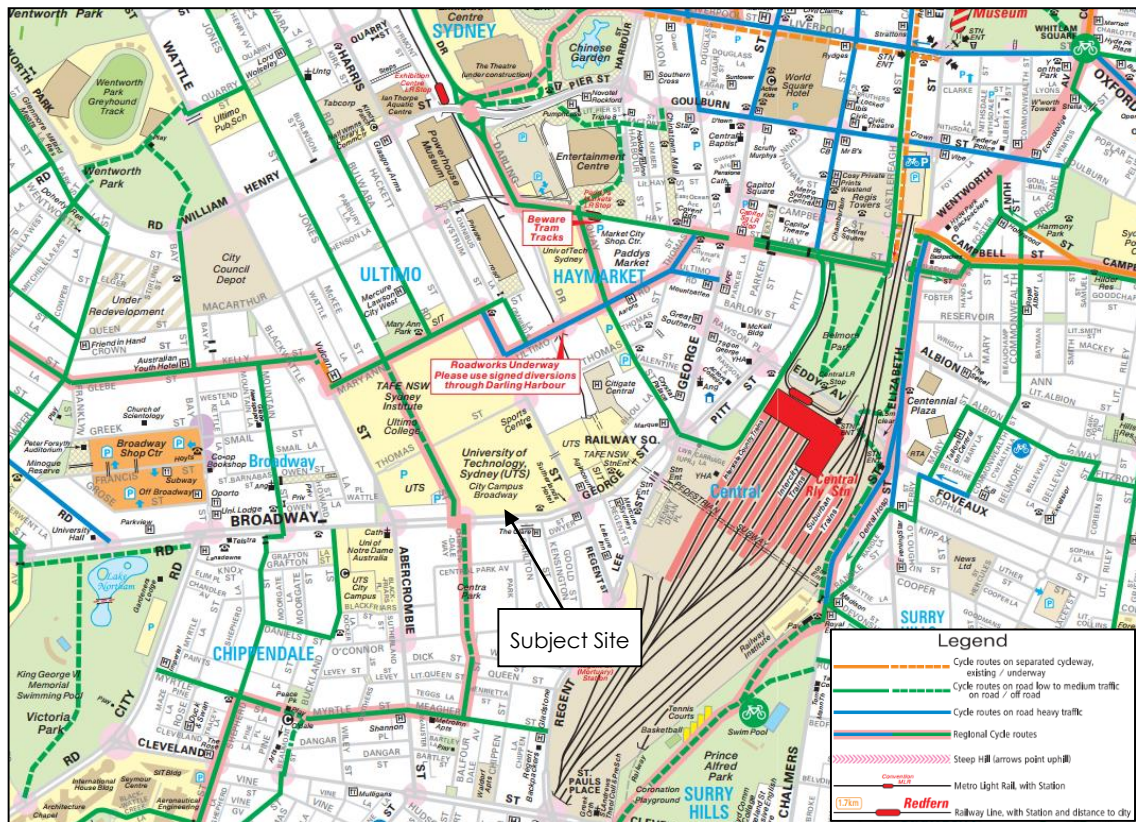


Source: UTS City Campus Masterplan, 2008

3.5 Cycle Infrastructure

The site is located within close proximity to both on and off-road cycling facilities as indicated in an extract from the City of Sydney's cycle network map shown in Figure 3.2. The nearest dedicated cycle facility surrounding the site is the four-metre wide shared path along Jones Street between Thomas Street and Mary Ann Street. This section of Jones Street is closed to vehicular traffic and is a key thoroughfare for the TAFE Sydney Institute.

Figure 3.2: Cycle network



Source: City of Sydney Cycling Map, 2015

Bicycle parking facilities are provided throughout the UTS City Campus with the nearest facilities to the site located at:

- Building 10 car park (entrance located at the corner of Thomas Street and Jones Street)
- Multi-purpose sports hall.

The Building 10 car park currently accommodates 288 bicycle parking spaces, 260 lockers, 14 toilets and 28 male and female showers. These bicycle parking spaces are an initiative of the original concept plan to provide staged increases in bicycle parking provision at UTS.

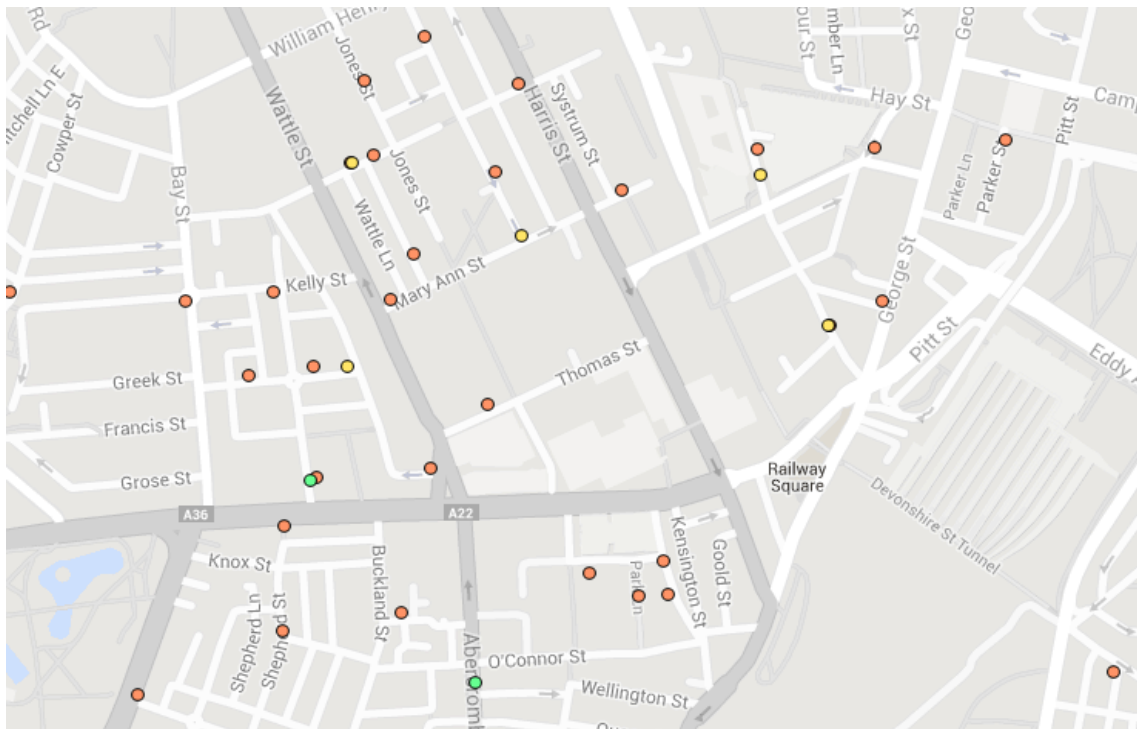
Figure 3.3: Building 10 bicycle parking



3.6 Local Car Sharing Initiatives

The locations of GoGet car sharing pods in the vicinity of the site are shown in Figure 3.4.

Figure 3.4: Car sharing pods



Source: City of Sydney, accessed 12 December 2015

3.7 Travel Mode Share

2011 Census data shows the existing journey to work patterns of people working in the areas in and around the UTS Campus. Travel Zone 159 contains the Broadway precinct of the UTS Campus and also the TAFE located adjacent to UTS as shown in Figure 3.5. The travel mode split of the travel zone 159 is summarised in Table 3.3.

Figure 3.5: Travel Zone 159

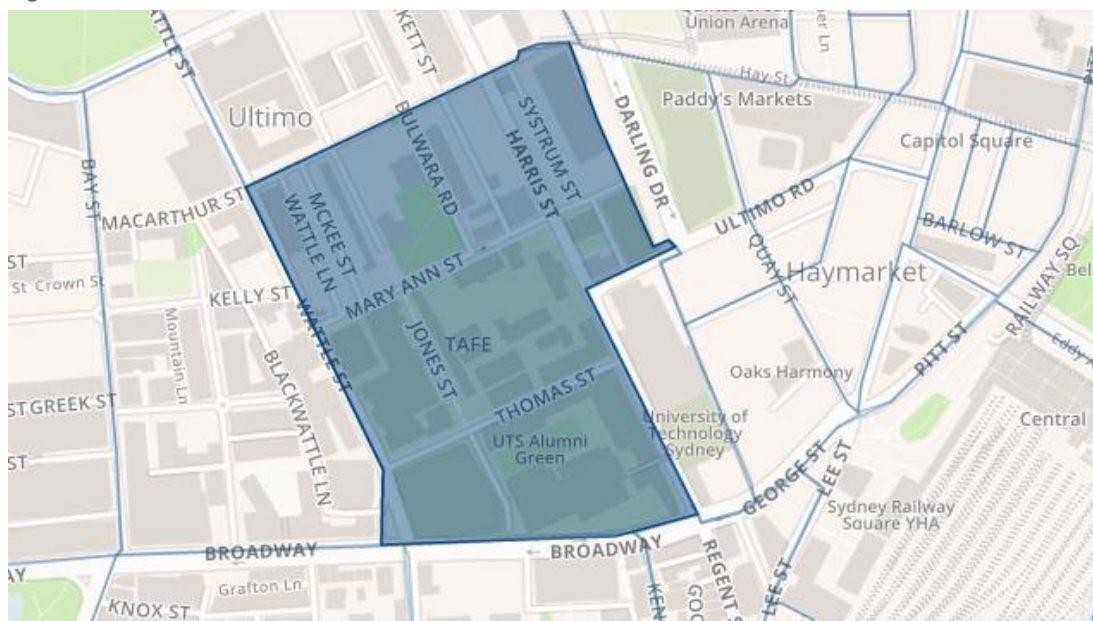


Table 3.3: Journey to work comparison

Mode	2006 mode share	2011 mode share
Vehicle driver	29%	23%
Vehicle passenger	4%	3%
Train	38%	42%
Bus	17%	18%
Walked	-	8%
Other	12%	4%
Mode not stated	-	2%
Total	12%	100%

Data source: 2006 data from Positive Traffic (2015), 2011 data from <http://visual.bts.nsw.gov.au/>, accessed 13/11/2015

The data presented in Table 3.3 relates to employees working in the Travel Zone 159. Due to the nature of the data (i.e. journey to work data from the Census), it is unlikely to include the travel behaviour of students.

UTS has conducted more recent travel behaviour of their staff and students. This data was presented in the UTS Sustainable Transport Plan 2013-2015.

The data presented in the 2013-2015 transport plan provides separated modal split for staff and students at UTS and is summarised in Table 3.4.

Table 3.4: UTS student and staff mode share

Mode	Staff	Students
Car	19%	7%
Train	43%	52%
Bus	22%	24%
Walk	10%	11%
Cycle	6%	6%
Other	1%	1%
Total	100%	100%

The modal share split for staff as presented in the travel plan is comparable with the Census data in Table 3.3, where 23 per cent of people drive, 42 per cent catch a train, 18 per cent catch a bus, compared to 19 per cent of drivers, 43 per cent of train and 22 per cent of bus users.

The modal share for students suggests that there is a far greater percentage of students travelling by non-car modes of transport with only seven per cent driving to the university, 52 per cent catching a train, and 24 per cent catching a bus.

4. Methods of Encouraging Modal Shift

4.1 Introduction

The location of the site, in terms of its close proximity to a wide range of sustainable transport, is a key attribute in the justification of the development. The Green Travel Plan will then put in place measures to raise awareness and further influence the travel patterns of those people working, studying or visiting the development with a view to encouraging modal shift away from cars.

The following measures are proposed to encourage students, staff and visitors to reduce travel by private cars and adopt alternative and more sustainable travel modes.

4.2 Site Specific Measures

4.2.1 Staff Measures

UTS will undertake the following measures to encourage its staff members to use more sustainable travel modes:

- No additional parking provision will be provided for the proposed site. Parking provision is to be maintained as existing to discourage new staff from driving to work.
- A car-pooling forum will be developed on the UTS website to encourage staff to travel in groups. The forum would provide a platform for people travelling on the same route to the university to find each other and form groups.
- UTS would provide and improve communication technology and facilities to enable staff to conduct video conferencing, tele-working and online lectures to avoid the need to travel to work and/ or travelling between meeting places.
- Provision of a TAG (the proposed guide is contained in Appendix A), which would be given to every new staff member joining UTS.
- Public transport information boards to make staff more aware of the alternative transport options available (the format of such information boards would be based upon the travel access guide).
- Provision of bicycle parking spaces and other related trip end facilities (such as showers and lockers). Their availability will be made known to staff through the TAG, information boards or via email letters.
- Ride/ walk to work days would be held and promoted.
- A regular update or article is to be provided to all staff members on their news feed bringing the latest news on sustainable travel initiatives in the area.

4.2.2 Students

UTS will undertake the following measures to encourage its students to use more sustainable travel modes.

- UTS will not provide any additional parking provision and will remove any student discounts to car parking fees within car parks controlled by UTS.
- UTS will encourage online lectures to be a more prominent part of courses. Greater use of online lectures will allow students to view lectures from home and thereby reduce the number of student travelling to the university.

- Health and well-being programs will be developed and promoted to encourage students into healthier living styles and ultimately encourage healthier transport options such as cycling or walking.
- Provision of a TAG (the proposed guide is contained in Appendix A), which would be given to every new student joining UTS.
- Public transport information boards would be available to make students and other visitors more aware of the alternative transport options available (the format of such information boards would be based upon the travel access guide).
- Provision of bicycle parking spaces and promotion of the availability of bicycle parking and end-of-trip facilities available to students.
- Promotion of Green Travel Plan initiatives, including health and well-being programs, bicycle parking provision and the travel access guide during student open days to introduce to potential new students the facilities available on campus to facilitate travel to UTS by non-car modes.

4.3 Wider Transport Measures

4.3.1 External Context

It is also recognised that changes to infrastructure, policy and services external to UTS will also have an impact on travel patterns to/ from and within the site. These include overarching and wider measures that are being considered and/ or implemented by others, which will have a positive impact on the mode share, greenhouse gas emissions and social aspects of travel associated with UTS. These include, among others:

- City of Sydney Council's strategic plans including:
 - *Sustainable Sydney 2030* program, which promotes cycling, car share, and public transport as predominant future modes of travel to the city, and places a focus on creating walkable, friendly urban areas
 - *Sydney City Centre Access Strategy 2013*, which has identified Broadway as a key link in the transport network
 - *NSW Long Term Transport Master Plan 2012* which includes plans to increase the capacity of Sydney's transport network
- The public's concerns regarding climate change
- Technology innovations
- State Government's involvement in improving transport infrastructure including:
 - Extension of the heavy rail e.g. north-west rail link
 - Light Rail expansion and development.

4.3.2 UTS Sustainable Transport Plan

UTS is strongly committed to its sustainability and environmental goals for the overall UTS Campus site. One of the main sustainability objectives is to reduce the number of people driving to the campus. As such, UTS has developed a number of plans across various facets of its operation. One of which is in the transport area – *UTS Sustainable Transport Plan 2013 – 2015*. UTS promotes the use of public transport for their staff and students as the preferred mode of travel. This is achieved through marketing and information provision wherever possible. In addition, UTS also encourages active transport modes such as walking and cycling through the provision of on-campus facilities including end of trip facilities.

The *UTS Sustainable Transport Plan* supports the City of Sydney's *Sustainable Sydney 2030* program to reduce car usage, reduce pollution and create approachable urban areas to encourage "connected communities".

The *UTS Sustainable Transport Plan* includes the following committed actions:

- Improving cycling facilities – The *Draft UTS Cycling Strategy 2011* recommended doubling the number of walk and cycle trips by staff and students (based on 2008 travel mode shares) which translates to a target of 25 per cent of staff and students travelling to the campus by active transport. UTS is committed to upgrading its bicycle facilities with provision of additional bicycle parking spaces with the aim of significantly increasing the number of cyclists at UTS. To facilitate this modal shift to cycle, it is proposed to provide more than 1,500 bicycle parking spaces, approximately 900 lockers and approximately 110 shower cubicles.
- Improving bicycle parking – It is proposed to transform Building 10 into a large bicycle hub where the vast majority of bicycle parking spaces (approximately 700 spaces) would be located. In addition, other buildings scattered across the campus including the recently open Dr Chau Chak Wing Building would have additional bicycle parking spaces. In the future, there would be up to 1,500 bicycle parking spaces. These bicycle spaces are strategically located so that it is within easy reach of staff and students on campus.
- Broadway Link – This is a City of Sydney Council initiative to enhance pedestrian and cyclist safety and amenity by providing a link for pedestrians and cyclists between Ultimo, Chippendale and Darlingtown. The link starts at Thomas Street near Harris Street and travels along Jones Street through UTS then on through the Central Park development and into Chippendale. This further connects to Wilson Street Cycleway providing access to Newtown and Erskineville for cyclists. The Broadway Link would significantly improve access to the UTS campus across Broadway. UTS has been and will continue to work collaboratively with City of Sydney Council to ensure the design of the link benefits all pedestrians and cyclists accessing the campus.
- Goods Line – The recently opened Goods Line is a shared pedestrian and cyclist path providing a traffic free, accessible thoroughfare connecting Central Railway Station with Darling Harbour passing in front of a number of UTS buildings.
- Electric cars and charging stations – UTS has provided three electric car charging station inside its Building 11 basement car park. Electric cars have been identified in *Sustainable Sydney 2030* as a positive measure of reducing pollution in the city.

4.4 Green Travel Plan Information

The information provided within the Green Travel Plan will be provided to staff and students in the form of a package of easy to understand travel information known as a TAG.

This will be included in the information pack provided to students and staff on day one of their time at UTS.

TAGs provide customised travel information for people travelling to and from a particular site using sustainable forms of transport – walking, cycling and public transport. It provides a simple quick visual look at a location making it easy to see the relationship of site to train stations, light rail stations, bus stops and walking and cycling routes.

Such TAGs encourage the use of non-vehicle mode transport and can reduce associated greenhouse gas emissions and traffic congestion while improving health through active transport choices.

They can take many forms from a map printed on the back of business cards or brochures. Best practice suggests that the information should be as concise, simple and site specific as possible and where possible provided on a single side/ sheet. If instructions are too complex, people are likely to ignore them.

A TAG has been prepared by GTA for the Building 2 site and is provided at Appendix A.

This TAG should be available for pick up at various locations at the Building 2 site such as, the front entrance, information centres or beside elevators.

It is noted that an existing Green Travel Plan (or as it is called, Sustainable Transport Plan) currently exists for the overall UTS City Campus, including an associated TAG. It is recommended that UTS update this Sustainable Transport Plan and TAG with more up to date information upon occupation of the redeveloped Building 2 and Building 1 podium.

4.5 Information and Communication

Several opportunities exist to provide students and staff with information about nearby transport options. Connecting students and staff with information would help to facilitate journey planning and increase their awareness of convenient and inexpensive transport options which support change in travel behaviour.

Transport for NSW info

- Bus, train and ferry routes, timetables and journey planning are provided by Transport for NSW through their Transport Info website: <http://www.transportnsw.info/>

Sydney Cycleways

- City of Sydney Council provides a number of services and a range of information to encourage people of all levels of experience to travel by bicycle:
<http://sydneycycleways.net/>

Connecting students via social media may provide a platform to informally pilot new programs or create travel-buddy networks and communication.

The above web links and any social media platforms may be included within the University Green Travel Plan/ TAG.

5. Management of the Plan

5.1 Monitoring

There is no standard methodology for the implementation and management of a Green Travel Plan however the Green Travel Plan will be monitored to ensure that it is achieving the desired benefits.

Travel surveys will be undertaken and the main focus of the surveys will be to establish the travel patterns including the mode share of trips to and from the site.

The implementation of the Green Travel Plan will need a formal Travel Plan Coordinator or Committee (TPC), who will have responsibility for developing, implementing and monitoring the Green Travel Plan. The TPC will be an appointed staff member(s) of UTS or an independent expert.

It will also be necessary to provide feedback to students and staff members to ensure that they can see the benefits of sustainable transport.

There are a number of key elements to the development and implementation of a successful Green Travel Plan. These include:

- Communication – Good communication is an essential part of the Green Travel Plan. It will be necessary to explain the reason for adopting the plan, promote the benefits available and provide information about the alternatives to driving alone.
- Commitment – The implementation of Green Travel Plans involves changing established habits or providing the impetus for people in new developments to choose a travel mode other than private car use. To achieve cooperation, it is essential to promote positively the wider objectives and benefits of the plan. This commitment includes the provision of the necessary resources to implement the plan, beginning with the introduction of the 'carrots' or incentives for changing travel modes upon occupation.
- Building consensus – It will be necessary to obtain broad support for the introduction of the plan from the staff and students.

Once the plan has been adopted, it is essential to maintain interest in the scheme. Each new initiative in the plan will need to be publicised and marketing of the project as a whole will be important.

5.2 Monitoring Milestones

As stated previously, the monitoring of the plan is a key item in establishing the existing travel patterns and to publicise the positive outcomes of the plan.

For this purpose, it is proposed that within six months of substantial occupation of site, a travel survey will be conducted with subsequent surveys to be conducted on an annual basis. The results of the travel survey will be analysed and used to determine if the proposed measures are encouraging a modal shift away from the private car. This information can then be used to inform future Green Travel Plans at UTS.

A key method of monitoring the effectiveness of the plan is to set a goal. In this regard, a minimum modal shift of five per cent away from car use by students and staff would be an aim of the plan:

- Car Share – 5 per cent
- Cycle +1 per cent
- Bus +2 per cent
- Train 2 per cent.

The existing travel mode share of the university as shown in Table 3.4 provides the initial base for the plan and indicates a current car use of the overall City Campus of 19 per cent by staff and seven per cent by students.

This actual mode share for the subject site would be confirmed following the initial travel survey of staff and students attending the new building following six months of occupation.

5.3 Remedial Actions

It will also be necessary to identify remedial actions should the modal share targets not be achieved. At this stage it is possible that such works could include:

- Increased cycle parking
- Increased/ improved changing facilities/ lockers
- Improved cycle and pedestrian links to the university
- Provision of shuttle buses from key locations
- Provision of free Opal/ train tickets to staff
- Increase use of car share (e.g. shared vehicles for staff).

6. Summary

A Green Travel Plan will be implemented at the proposed Building 2 development at UTS. It will aim to encourage alternative transport choices to single car use and encourage a shift to public transport, cycling and/ or walking.

The following measures are proposed to encourage staff and students to reduce travel by private cars and adopt alternative and more sustainable travel modes:

- Provision of a car-pooling forum to encourage staff to travel in groups
- Improved communication technology and facilities to enable staff to conduct video conferencing, tele-working and online lectures to enable staff to work from home.
- Greater use of online lectures will allow students to view lectures from home and thereby reduce the number of student travelling to the university
- Health and well-being programs for staff and students
- Provision of bicycle parking spaces and promotion of the availability of bicycle parking and end-of-trip facilities
- Provision of a TAG (the proposed guide is contained in Appendix A), which would be given to every new staff and student joining UTS
- Public transport information boards would be available to make students and other visitors more aware of the alternative transport options available (the format of such information boards would be based upon the TAG)
- Promotion of Green Travel Plan initiatives, including car-pooling, health and well-being programs bicycle parking provision and the travel access guide during student open days to introduce to potential new students the facilities available on campus to facilitate travel to UTS by non-car modes
- A regular update or article is to be provided to all staff members on their news feed bringing the latest news on sustainable travel initiatives in the area
- UTS will not provide any additional parking provision and will remove any student discounts to car parking fees within car parks controlled by UTS.

The above measures would be reinforced by external transport measures proposed by City of Sydney Council and by UTS for the wider Campus.

The Green Travel Plan should be regularly monitored by carrying out travel surveys and updated as required to ensure its successful implementation and achievement of mode share goals.

Appendix A

Transport Access Guide

T By Train: The UTS campus is located in the centre of the Sydney public transport network with Central Station located within a 10 minute walk from Building 2. Central Station provides frequent train services to the wider Sydney rail network. Adjacent to Central Station is the Central bus interchange, connecting UTS to Sydney by both bus and rail.

 **By Bicycle:** Bicycle racks are provided throughout the UTS. Within a 2 minute walk, racks can be found within the Multi-Purpose Sports Hall and within the Building 10 car park. Shower facilities for cyclists are also available within the Building 10 car park.

Several official bike routes surround UTS, making UTS a good location to get to by cycling. Cycling is a great way in which you can improve health and reduce greenhouse gas emissions.

 **Opal Public Transport Tickets:** Opal cards are available at news agents within the local area. The Opal card is an easy, convenient way of paying for your travel on public transport. It's the only card you'll need to get around on all public transport including trains, ferries, buses and light rail.



For further public transport information go to
www.transportnsw.info or call 131 500

CONTACT

University of Technology, Sydney
Ph: 02 9514 2000

Prepared By



Transport Access Guide

How to travel to and from
Building 2, University of Technology Sydney



Universal Access: Building 2 provides an accessible entrance and lift access to upper floors for the mobility impaired. For travel to UTS from public transport, city roads include wide foot-paths and ramps to accommodate all pedestrians to walk freely.



By Bus: Building 2 is well serviced by the bus network with the nearest bus stop located within a 1 minute on Broadway and Railway Square, a major bus interchange, located within a 5 minute walk. Together the bus stops near UTS service up to 50 bus routes.

Go to the Transport Info website (www.transportnsw.info) for bus timetables and accessible bus services.



By Light Rail: The Eddy Avenue Light Rail Station is located adjacent to Central Railway Station. The light rail provides services every 10 to 15 minutes up to Dulwich Hill via Lilyfield.



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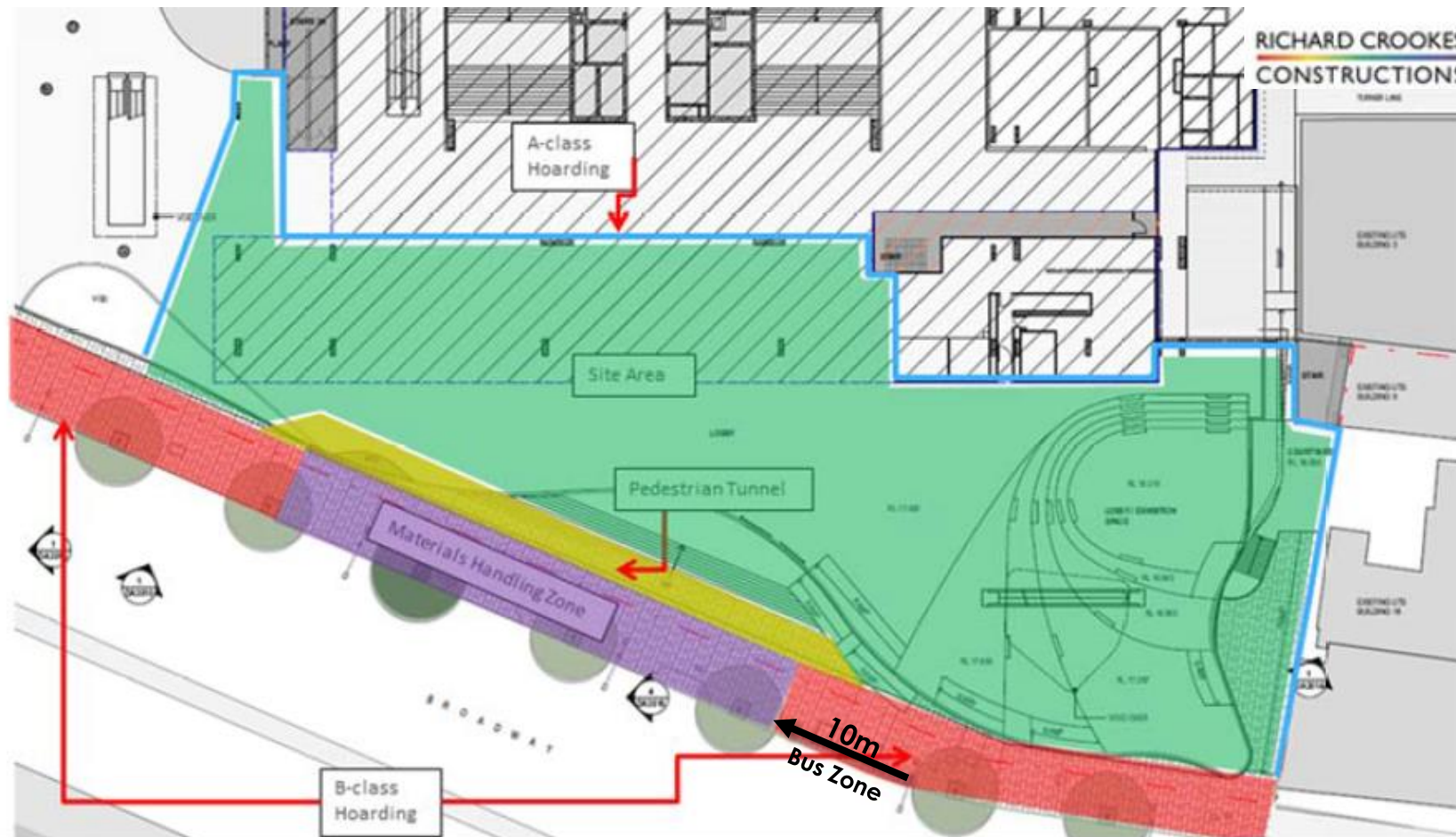
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Attachment 3

Phase 2 Construction Site Layout



Phase 2 – Site Establishment

Note: Richard Crooks have confirmed that a minimum clearance of 10 metres will be provided at the bus shelter to ensure passenger movements are not impacted by the proposed materials handling zone (marked in purple). This is compliant with the Bus Infrastructure Guide for a minimum passenger standing area of 9m.

Attachment 4

Access Arrangements

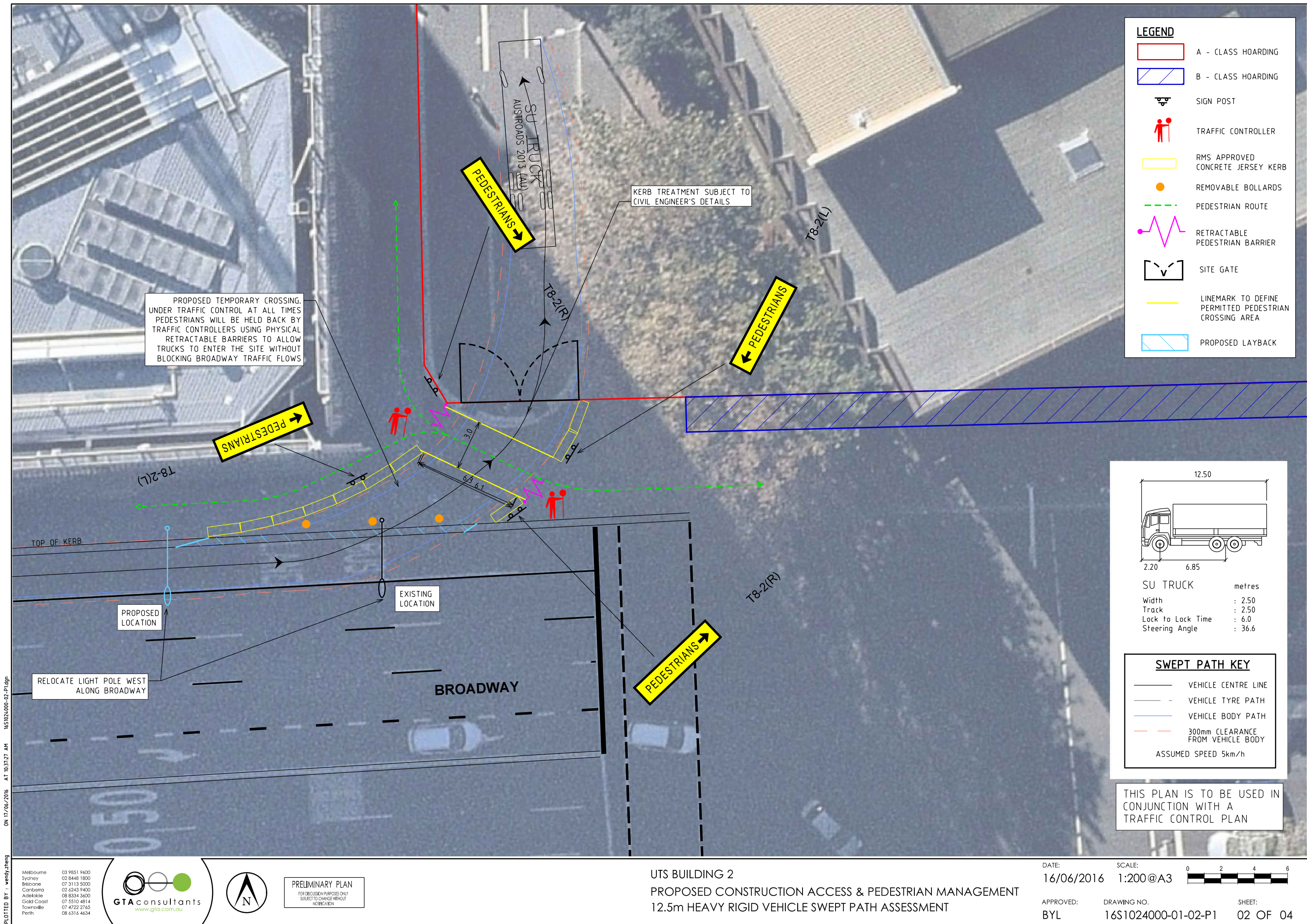


THOMAS STREET

JONES STREET

UTS BUILDING 10

WATTLE



16S1024000-01-02-P1.dgn
ON 17/06/2016 AT 10:37:27 AM
PLOTTED BY : wendy.zheng

Melbourne 03 9851 9600
Sydney 02 8448 1800
Brisbane 07 3113 5000
Canberra 02 6243 9400
Adelaide 08 8334 3600
Gold Coast 07 5510 4814
Townsville 07 4722 2765
Perth 08 6316 4634



PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT
NOTIFICATION

UTS BUILDING 2
PROPOSED CONSTRUCTION ACCESS & PEDESTRIAN MANAGEMENT
12.5m HEAVY RIGID VEHICLE SWEEP PATH ASSESSMENT

DATE: 16/06/2016
SCALE: 1:200@A3
APPROVED: BYL
DRAWING NO. 16S1024000-01-02-P1

SHEET: 02 OF 04