GTAconsultants

Brewery Yard Building, Central Park, Chippendale

State Significant Development Application

Transport and Accessibility Impact Assessment

Client // IP Development
Office // NSW
Reference // N155980
Date // 25/07/19

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
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1. Introduction

1.1 Background

A State Significant Development Application (SSDA) is to be lodged for the proposed development at the existing Brewery Yard site at Central Park in Chippendale.

The site is part of the broader Central Park precinct, which is the subject of the Central Park Concept Plan (MP06_0171 as modified). The Concept Plan sets the key planning framework for the future development of the site, including identifying development blocks (the Brewery Yard is described as Block 4B), setting building envelopes within which future development is to be designed, and addressing car parking, road layout and transport movements. The Central Park Concept Plan provides for a total of 255,621 square metres gross floor area across the entire site, and combined basement carparks located in Blocks 1, 4 and 8, and Blocks 2, 5, 9 and the Kensington Precinct.

The proposal is for alterations and additions to the adaptive reuse of the Brewery Yard for commercial and ancillary retail uses.

GTA Consultants (GTA) was commissioned by Johnstaff Projects (Johnstaff) on behalf of IP Development to undertake a transport and accessibility assessment for the proposed development.

1.2 Purpose of this Report

In accordance with Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act), a request for Secretary's Environmental Assessment Requirement (SEARs) was sought to guide the proposed development of the Brewery Yard.

This report addresses the transport and accessibility SEARs (construction and operation) received from Department of Planning and Environment (DPE), as referenced in Table 1.1.

Table 1.1: SEARs and relevant report section

Requirement	Relevant report section
Policies	
Address the relevant planning provisions, goals and strategic planning objectives in the following:	
○ Future Transport 2056 Strategy	Section 1.4 Section 6.1
○ Guide to Traffic Generating Developments (Roads and Maritime)	
○ Guide to Traffic Management – Part 12: Traffic Impacts of Development (AUSTROADS)	
○ NSW Planning Guidelines for Walking and Cycling	
○ Sydney's Cycling Future 2013	
○ Sydney's Walking Future 2013	
○ Sydney City Centre Access Strategy 2013	
Transport and Accessibility (construction and operation)	
Prepare a transport and accessibility impact assessment, which addresses the following:	
○ Provide current daily and peak hour vehicle, public transport, pedestrian and bicycle movements and mode share from existing buildings / uses on the site	Section 2.2 Section 2.3 Section 2.6 Section 2.9

Requirement	Relevant report section
○ forecast daily and peak hour vehicle, public transport, pedestrian and bicycle movements and mode share as a result of the development, together with the cumulative impacts of existing, proposed and approved developments in the area and any traffic and transport infrastructure upgrades	Chapter 6
○ impacts of the proposed development on the operation of existing and future transport networks, including the rail capacity, and its ability to accommodate the forecast number of trips to and from the development	Section 6.3
○ existing and future performance of key road intersections providing access to the site supported by appropriate modelling and analysis to the satisfaction of the Roads and Maritime Services	Section 2.4 Section 6.3
○ assessment of the cumulative impacts of traffic volumes from the proposed development together with existing and other approved developments in the area and measures to mitigate any associated traffic, public transport, pedestrian and bicycle network impacts	Section 6.2.2
○ existing and proposed vehicle access and parking arrangements for employees and visitors, including compliance with appropriate parking controls	Section 3.2 Chapter 4
○ appropriate provision, design and location of on-site bicycle parking, and how the provision of cycling will be integrated with the existing cycle networks	Section 3.4 Section 5.1
○ the measures to be implemented to encourage users of the development including workers and visitors, to make sustainable travel choices, including walking, cycling, public transport and car sharing, particularly the provision of end-of-trip facilities, pedestrian and cyclist facilities in secure, convenient, accessible areas close to main entrances, incorporating lighting and passive surveillance	Section 5.2
○ provide details of service and delivery vehicle movements and site access arrangements (including vehicle type and likely arrival and departure times)	Section 4.5
Prepare a construction pedestrian and traffic management plan, which details the following:	
○ the cumulative impacts associated with other construction activities including the construction of the Sydney Light Rail project	Section 7.6.3
○ road safety at key intersections and locations subject to heavy vehicle movements and high pedestrian activity	Section 7.6.1
○ details of anticipated peak hour and daily truck movements to and from the site	Section 7.4
○ details of access arrangements for workers to/from the site, emergency vehicles and service vehicle movements	Section 7.2.3 Section 7.3 Section 7.5 Section 7.7
○ details of temporary cycling and pedestrian access during construction	Section 7.6.1
○ details of proposed construction vehicle access arrangements at all stages of construction	Section 7.3
○ assessment of traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrians, cyclists and public transport operations.	Section 7.3 Section 7.6

1.3 References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds
- City of Sydney (CoS) Local Environmental Plan (Sydney LEP) 2005
- CoS Development Control Plan (Sydney DCP) 2012
- Future Transport 2056 Strategy
- Roads and Maritime Services (Roads and Maritime) Guide to Traffic Generating Developments 2012 and Technical Direction: Updated Surveys (TDT 2013/ 04)
- Austroads Guide to Traffic Management – Part 12: Traffic Impacts of Development
- NSW Planning Guidelines for Walking and Cycling
- Sydney's Cycling Futures
- Sydney's Walking Futures
- Sydney City Centre Access Strategy 2013
- Australian Standard/New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- Australian Standard/New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- traffic surveys undertaken by Matrix Traffic on Wednesday 25 July 2018, as referenced in the context of this report
- plans for the proposed development prepared by Tzannes, Drawing Number 17007 DA-0100, Revision B, dated 12 December 2018
- other documents and data as referenced in this report.

1.4 Other Studies and References

Reviews have been completed for the following supporting transport studies and references.

Traffic and Parking Assessment Central Park Brewery Yard Project (Halcrow, 2011)

Halcrow prepared a traffic and parking assessment report in 2011 for the Brewery Yard development - a mixed commercial/ retail development located within the Central Park development formerly known as Frasers Broadway. The project application for the development has subsequently been approved by the DPE.

The parking assessment indicated that a maximum permissible parking of 487 spaces is to be provided as part of the project application for Blocks 1 and 4, which is in line with the Sydney LEP 2005. Of the 487 spaces, the Brewery Yard, which at the time comprised of 2,681 square metres GFA of retail space, 1,077 square metres GFA of commercial and 440 square metres GFA of community space, would have been allocated 18 parking spaces.

In addition, the traffic assessment indicated the entire Central Park development, including the Brewery Yard, would generate some 493 vehicle trips per peak hour. This assessment also concluded that the surrounding road network would continue to operate satisfactorily.

Future Transport 2056 Strategy

A review of the Future Transport 2056 Strategy plan indicates that two transport projects would be delivered near the site. Therefore, the projects identified within Chippendale include:

- New Intercity Fleet – A new fleet of trains will come into service progressively, with the first trains being delivered from 2019 and will replace the trains carrying customers from Sydney to the Central Coast, Newcastle, the Blue Mountains and the South Coast. The new double deck trains aim to give long distance customers a more comfortable travelling experience. The trains will be safe, comfortable, accessible and provide an appealing environment for customers during longer journeys.
- Redfern Station was recently upgraded to improve access for customers. The project included a new lift to platforms 6 and 7, a new section of canopy providing sheltered access to the lift, and new CCTV, lighting and fencing around the lift area.

NSW Planning Guidelines for Walking and Cycling

The Planning Guidelines for Walking and Cycling provide guidance to land-use planners to ensure that walking and cycling improvements are taken into consideration in planning policy and practice. The guidelines provide a walking and cycling focus to the NSW Government's Integrating Land Use and Transport Planning Policy Package.

The guidelines suggest that "*when making planning instruments, councils are encouraged to integrate relevant state and local policies related to walking and cycling*". This includes development policies in the DCPs and LEPs that encourage walking and/ or cycling that would be considered during the development assessment stage thereby encouraging improvements to walking and cycling facilities.

Sydney's Cycling Futures

Transport for NSW (TfNSW) is developing a range of customer initiatives that will raise the profile of bicycle riding as a fun, healthy, easy and flexible transport option. TfNSW will provide information to customers on how to plan a safe riding route to their destination. TfNSW will also introduce initiatives to improve compliance with the bicycle related road rules when riding or driving on the road.

- Travel choices: TfNSW will support programs designed for everyday destinations to inform customers of their travel choices and provide incentives for them to ride. These programs will help ease congestion around key destinations at peak times.
- Road safety education program: This is a long-term integrated educational initiative that aims to increase students' road safety knowledge, understanding and skills and to develop positive road user attitudes and safe behaviours in children and adolescents, including safe bicycle riding.
- Community bicycle and road safety education facilities: TfNSW will continue to work to instil safe cycling practices into school age children. Many facilities exist for children to learn road skills and safe cycling practice away from live traffic.
- Support existing health programs: TfNSW will work with the Ministry of Health and the Office for Preventive Health on programs such as the Healthy Children Initiative, Active Travel to School and Healthy Workers Initiative. TfNSW will also continue to support a range of existing programs run by non-governmental organisations that encourage people to choose cycling as their transport choice.
- Transport management association: TfNSW has introduced a partnership between multiple levels of government and local businesses. This is being piloted at Macquarie Park. TfNSW will explore opportunities to progressively rollout Transport Management Associations in other areas. These associations will support cycling in local communities through routes, facilities and ensure people have appropriate information and support.

Sydney's Walking Futures

TfNSW will create a culture of walking as a viable and attractive transport choice through implementing four major factors as follows:

- Connectivity and reduced delays: More direct routes that connect public transport and centres and create more pleasant trips.

- Pedestrian safety and personal security: Increased safety and security built into infrastructure, such as slowing traffic in busy areas and good lighting.
- Health and wellbeing benefits: Programs to promote the physical, emotional and social benefits of walking, such as travel behaviour and travel planning initiatives, particularly in settings such as schools, universities and workplaces.
- Supporting facilities: Better protection from the weather, more signage and more facilities at transport interchanges to support walking.

TfNSW will encourage more people to walk during peak times to ease congestion on roads and free up capacity on public transport, particularly around schools as well as promoting the physical, emotional and social benefits of walking.

Sydney City Centre Access Strategy 2013

The Sydney City Centre Access Strategy will deliver a fully integrated transport network in Sydney's city centre that puts the customer first and meets the growing transport needs.

The Access Strategy considers all transport modes and their key networks. The development of the Access Strategy has balanced the needs of customers for each transport mode to deliver a more integrated network that makes the best use of finite space in the Sydney city centre. An integrated network has significant customer benefits including:

- making interchange easier
- improving reliability of surface public transport (buses, light rail and taxi)
- improving safety for all users
- reducing conflict between modes.

The integrated city centre transport network has the following key features:

- light rail on George Street between Central and Circular Quay
- new interchange precincts at Town Hall, Wynyard, Central, Circular Quay, Martin Place and Museum
- an integrated cycleway network
- a new railway line and train stations for the city centre
- new designated traffic routes through and around the city centre.

Summary

The strategies identified will improve commuting to/ from Central Park and the Sydney CBD, encouraging a greater use of public transport and therefore reducing the need for parking spaces. The site is located within the Central transport interchange precinct having access to Sydney Trains, NSW TrainLink, Light Rail services as well as a variety of bus routes. In conjunction with the existing and proposed walking and cycling facilities and infrastructure as part of the broader Central Park precinct, the use of alternative transport modes for travel to/ from the development to reduce the reliance on private vehicle travel would be encouraged which is consistent with the intent of the reviewed strategies.

2. Existing Conditions

2.1 Site Context

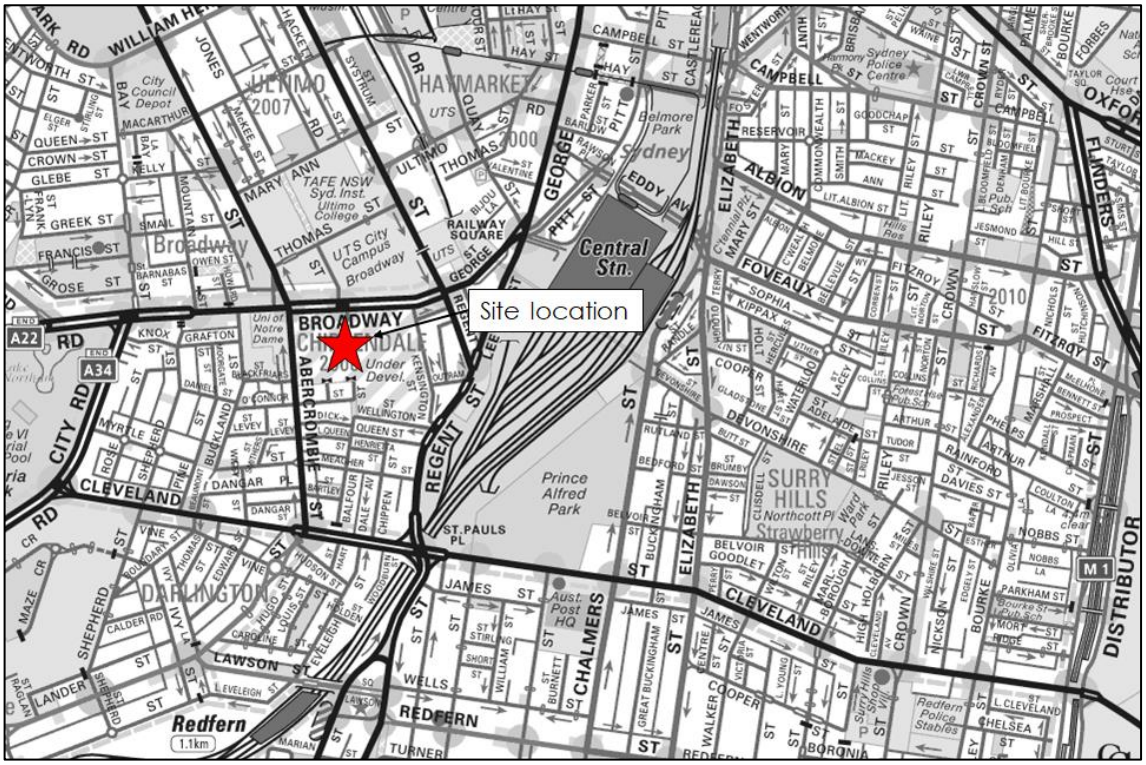
The subject site is located within Central Park in Chippendale on the southern edge of the Sydney CBD, near Central Railway Station, University of Technology Sydney (UTS) and Broadway Shopping Centre.

The site is bounded by Central Park Avenue to the north, west and south and is historically a power station, which is currently vacant and non-operational.

The surrounding properties mainly consist of mixed-use developments and residential uses along Broadway and Abercrombie Street, with UTS located within walking distance to the north of the site.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject site and its environs



Basemap Source: Sydway

2.2 Road Network

The local road network in the immediate vicinity of the subject site includes Broadway, Abercrombie Street, Chippendale Way, Central Park Avenue, Irving Street, O'Connor Street, Kensington Street and Carlton Street.

Broadway

Broadway (Figure 2.2) is a State Road and is aligned in an east-west direction to the north of the site. It is a two-way road configured with four lanes in each direction (including one bus lane in each direction) and functions as one of the main routes for traffic into and out of the Sydney

CBD. Broadway has a posted speed limit of 50 kilometres per hour near the site. Kerbside parking is not permitted on either side of the road.

Broadway carries approximately 30,000 vehicles per day[1].

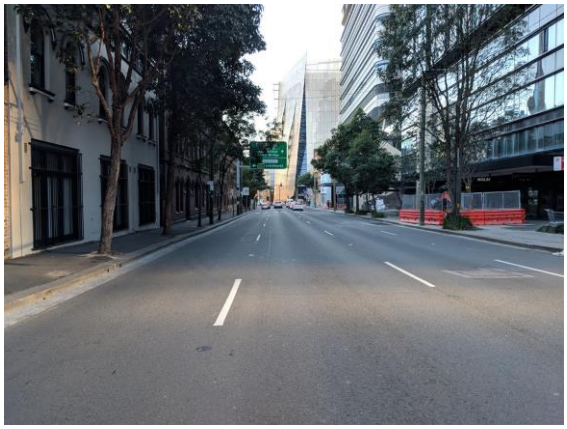
Abercrombie Street

Abercrombie Street (Figure 2.3) is a State Road and is aligned in a north-south direction to the west of the site. It is a one-way road with four lanes running north over an approximately 13-metre wide carriageway. Abercrombie Street has a posted speed limit of 50 kilometres per hour. Near the site, two-hour kerbside parking is only permitted on the western side of the road.

Abercrombie Street carries approximately 15,000 vehicles per day[1].

Figure 2.2: Broadway

Figure 2.3: Abercrombie Street



O'Connor Street

O'Connor Street (Figure 2.4) is a local road and is aligned in an east-west direction. It is a two-way road with one lane in each direction over an approximately six-metre wide carriageway. It connects Abercrombie Street to Irving Street. Two-hour kerbside parking is permitted off the carriageway on the southern side of the road.

Irving Street

Irving Street (Figure 2.5) is a local road near the site and is aligned in an east-west direction. It is a one-way road in the eastbound direction only. It connects Abercrombie Street to Central Park Avenue.

[1] Based on the peak hour traffic counts undertaken by GTA in July 2018 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

Figure 2.4: O'Connor Street

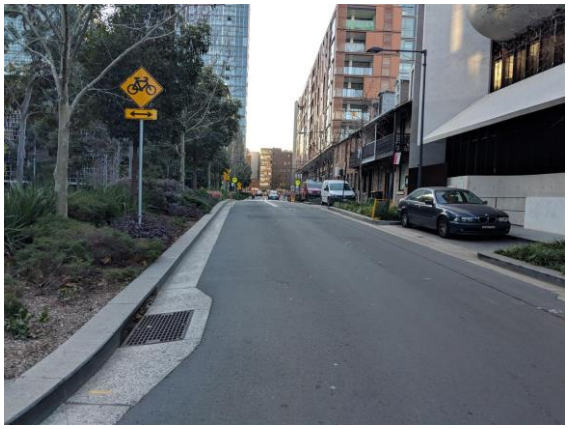


Figure 2.5: Irving Street

Chippendale Way

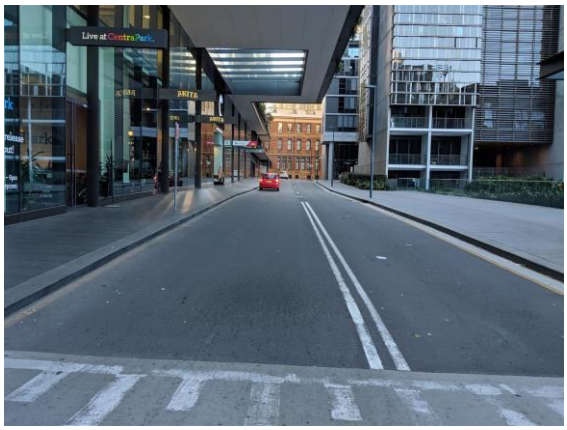
Chippendale Way (Figure 2.6) is a local street located within the Central Park site and is aligned in the north-south direction. It generally has one traffic lane in each direction. Kerbside parking is not permitted along Chippendale Way. Chippendale Way provides two traffic lanes in each direction south of Broadway.

Central Park Avenue

Central Park Avenue (Figure 2.7) is a local street providing access to the Central Park development from Broadway. Central Park Avenue allows two-way traffic, facilitating local traffic and service vehicles access within Central Park. It generally has one traffic lane in each direction and kerbside parking is not permitted.

Figure 2.6: Chippendale Way

Figure 2.7: Central Park Avenue



Kensington Street

Kensington Street is a local road with a shared zone between Broadway and O'Connor Street and is aligned in a north-south direction. It is a one-way road in the northbound direction only. Kerbside parking is permitted on the western side of the road with 15-minute and four-hour time restrictions.

Carlton Street

Carlton Street is a local road with one traffic lane in each direction. It is aligned in the north-south direction. It has a posted speed limit of 50 kilometres per hour with restricted two-hour and four-hour kerbside parking as well as car share parking permitted on the western side of the road.

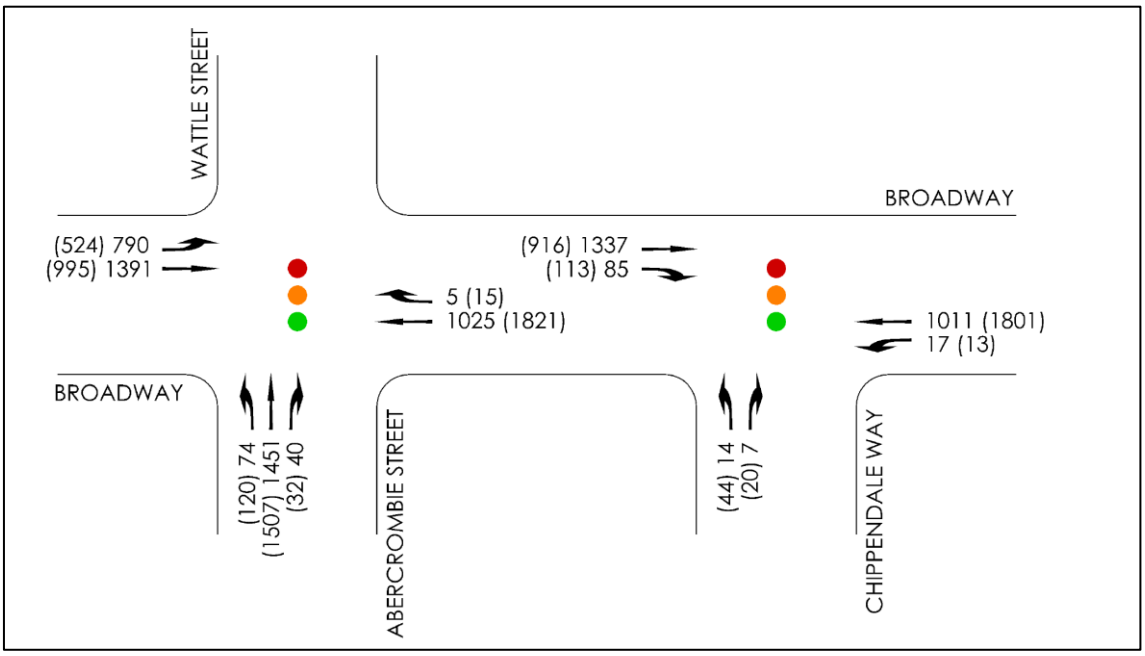
2.3 Traffic Volumes

GTA commissioned traffic movement counts at the Broadway intersections with Chippendale Way and Abercrombie Street on Wednesday 25 July 2018 during the following peak periods:

- AM peak: 7am to 10am
- PM peak: 4pm to 7pm.

The AM and PM peak hour traffic volumes are summarised in Figure 2.8, with full results contained in Appendix A.

Figure 2.8: Existing AM/ PM peak hour traffic volumes



2.4 Intersection Operation

The operation of the key intersections within the study area have been assessed using SIDRA Intersection[2], a computer-based modelling package, which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the Roads and Maritime, is vehicle delay. SIDRA Intersection determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 2.1 shows the criteria that SIDRA Intersection adopts in assessing the level of service.

[2] Program used under license from Akcelik & Associates Pty Ltd.

Table 2.1: SIDRA Intersection - Level of Service criteria

Level of Service	Average delay per vehicle (secs/veh)	Traffic signals, roundabout	Give way and stop sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2.2 presents a summary of the existing operation of the intersection, with full results presented in Appendix B.

Table 2.2: Existing Operating Conditions

Intersection	Peak	Leg	Degree of saturation	Average delay (sec)	95th percentile queue (m)	Level of Service
Broadway/ Abercrombie Street (signalised)	AM	South	0.88	47	264	D
		East	0.33	3	23	A
		West	0.86	25	329	B
		Overall	**0.88**	**27**	**329**	**B**
	PM	South	0.99	83	408	F
		East	0.60	6	61	A
		West	0.77	33	199	C
		Overall	**0.99**	**39**	**408**	**D**
Broadway/ Chippendale Way (signalised)	AM	South	0.02	34	4	C
		East	0.32	17	77	B
		West	0.32	3	67	A
		Overall	**0.32**	**9**	**77**	**A**
	PM	South	0.07	36	13	D
		East	0.54	17	152	B
		West	0.40	4	39	A
		Overall	**0.54**	**13**	**152**	**B**

Table 2.2 indicates that overall, both the Broadway/ Abercrombie Street and Broadway/ Chippendale Way intersections currently operate with an acceptable overall level of service D or better in both the AM and PM peak hours.

It should be noted that the south approach on the Broadway/ Abercrombie Street intersection experiences a high average delay in the PM peak hour. This is related to the long phase time given to the movements along Broadway (east and west approach to the intersection). On-site observations showed most vehicles were generally able to get through the intersection in one cycle, which is reflected in the SIDRA Intersection modelling results.

2.5 Car Parking

There are currently 487 car parking spaces within the Block 1 basement car park that forms part of the Central Park precinct. All these spaces are allocated to either Blocks 1or 4, or the Brewery Yard. Approval for Block 1 (SSD6554) allocated 10 spaces within basement level 1 to the Brewery Yard. The Block 1 car park does not provide parking for the general public. Further, the approved Condition E2(a)(ii) of MP09_0078 permits unsold separate utility spaces within Lot 305 and Lot 306

to be used by owners and occupiers within the Central Park Precinct, if not taken up by the owner or occupiers of the relevant lots within 24 months of the registration of the respective Strata Plan. As such, the Brewery Yard proposes to use 20 spaces that have been constructed in the Block 2 basement and allocated for the use by the Lot 305 Central Park Mall retail tenants.

A small number of on-street public parking spaces (15-minute, two-hour and four-hour restricted kerbside parking) are available along the local road network in the immediate vicinity of the site that is suitable for short-term parkers (i.e. visitors to Central Park).

2.6 Public Transport

The site is well serviced by high frequency and highly accessible public transport with Central Transport Interchange, the key transport hub in Sydney located within 600 metres east of the site.

2.6.1 Bus Network

The site, being within the Sydney City Centre, is well served by high frequency and highly accessible buses travelling along Parramatta Road/ Broadway and Harris Street and services at the Central bus interchange.

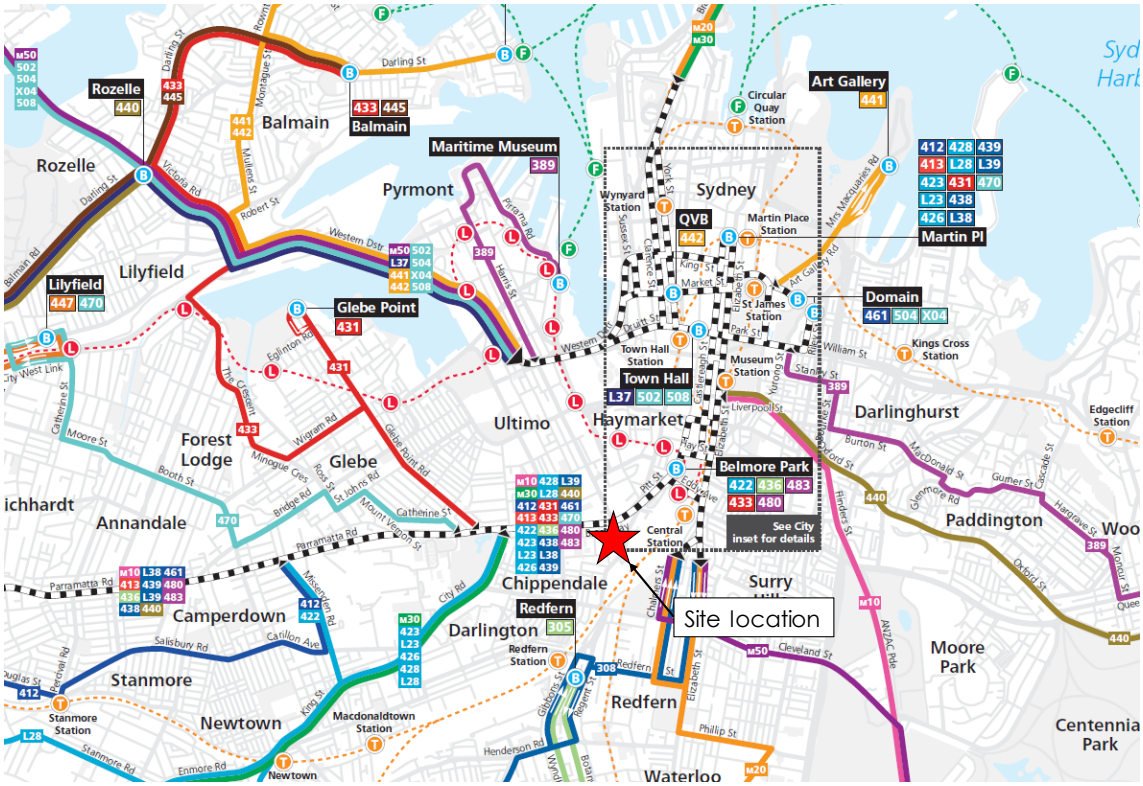
The bus interchange (shown in Figure 2.9) is located approximately 550 metres east of the site (seven-minute walk) and accommodates approximately 20 separate bus routes, which combine to provide a high level of accessibility with a range of key destinations including the Sydney CBD, Lower North Shore, Eastern Suburbs, Inner West and Sutherland Shire.

Bus services are regular and at 10-minute headways during the peak periods. The nearest bus stop is located opposite the Central Park Mall on Broadway, as shown in Figure 2.10. The bus routes that are currently serving the subject site are shown in Figure 2.11.

Figure 2.9: Central station bus interchange

Figure 2.10: Central Park bus stop

Figure 2.11: Bus routes serving the subject site



Source: Transport for NSW – Inner West Network Map retrieved 22 July 2019

2.6.2 Rail Network

The site is located within approximately 600 metres (eight-minute walk) from Central Railway Station. Central Railway Station services all train lines within the Sydney Train and NSW TrainLink networks, and is a major terminus for suburban as well as interstate rail services. Sydney Metro will also commence providing services to the area from 2023 further expanding the heavy rail catchment for the site and broader area.

The site is also located within walking distance of existing and future light rail stops at Central Railway Station. Running from Central, the light railway network connects Dulwich Hill to the inner-city areas such as Darling Harbour and Ultimo. It has a frequency of 7.5 minutes during the day and 15 minutes between 7pm and 12am. The CBD and South East Light Rail (CSELR) is expected to commence operating from early 2020. This will connect Central and the broader Sydney CBD with Randwick and Kingsford via Surry Hills and Moore Park.

2.6.3 Summary

A review of the public transport services available near the site is summarised in Table 2.3.

Table 2.3: Public transport provision

Service	Route	Route description	Location of stop	Distance to nearest stop	Frequency on/ off peak
Bus	412	Campsie to City via Earlwood	Broadway near Harris Street	20 m	10 minutes peak/ 15-20 minutes off peak (including weekend)
	413	Campsie to City via Ashbury			
	422	Kogarah to City via Newtown			
	423	Kingsgrove Depot to City - Martin Place			
	426	Dulwich Hill to City - Martin Place			
	428	Canterbury to City - Martin Place			
	431	Glebe Point to City - Martin Place			
	433	Balmain to Railway Square			
	436	Rodd Point to Railway Square			
	438	Abbotsford to City - Martin Place			
	439	Mortlake to City - Martin Place			
	440	Bronte to Rozelle			
	461	Burwood to The Domain			
	470	Lilyfield to City - Martin Place			
	480	Strathfield to Railway Square			
	483	Strathfield to Railway Square			
	M10	Leichhardt to Maroubra Junction via City			
	M30	Spit Junction to Sydenham via City			
Train		T3 Bankstown Line	Central Station	600 m	3-15 minutes peak/ >15 minutes off peak (including weekend)
		T4 Eastern Suburbs and Illawarra Line			
		Blue Mountains Line			
		Central Coast and Newcastle Line			
		South Coast Line			
		Southern Highlands Line			
Light Rail	L1	Central to Dulwich Hill			7-15 minutes peak and off peak

2.7 Pedestrian and Cycle Infrastructure

The site is also very well situated in terms of provision for walking and cycling. There are a number of strategic and local cycling routes and links in the vicinity of the site.

Footpaths are currently provided along the majority of roads (Broadway, Chippendale Way, Central Park Avenue and Carlton Street) in the local network. Wide footpaths are available on both sides of Broadway near the site. Similarly, along Harris Street, Regent Street, and Abercrombie Street, footpaths are also available on both sides of the streets.

The pedestrian network continues into the residential streets to the south and west of the site as well as across Broadway into the area to the north of the site. Excellent pedestrian facilities are provided through the subject site with connections to the broader Sydney CBD pedestrian network.

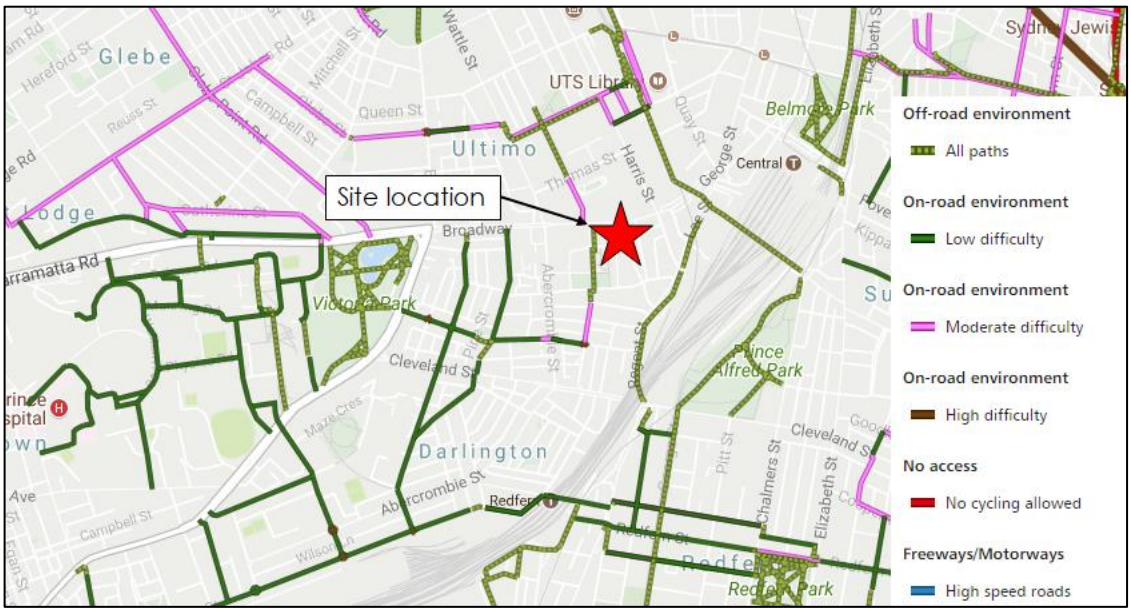
Signalised pedestrian and bicycle crossing facilities are provided at the following locations:

- all legs of the Abercrombie Street/ Broadway/ Wattle Street intersection
- all legs of the Broadway/ Chippendale Way intersection
- all legs of the Abercrombie Street/ O'Connor Street intersection.

In addition, there is an existing on-road cycle path that runs along Wilson Street near Newtown that joins on to Shepherd Street to continue along Broadway near Mountain Street before

heading north along Jones Street towards Pyrmont Bay. The section along Broadway is provided as off-road shared pedestrian/ cyclist path. A combination of other on-road and off-road cyclist links provide access through the site, connecting Central Park to the broader city bicycle network and infrastructure. On-road cycling is also permissible on the local road network where traffic volumes are generally considered to be moderate. Figure 2.12 shows the existing bicycle routes near the subject site.

Figure 2.12: Existing cycling routes



Source: rms.nsw.gov.au/maps/cycleway_finder retrieved 22 July 2019

It is further noted that the CoS provides bicycle parking spaces on most streets within its boundaries. The bicycle parking spaces are provided either as bicycle rings or U-rail parking.

There are a number of bicycle parking spaces located along the surrounding road network and within the public domain of the overall Central Park development site. Figure 2.13 and Figure 2.14 show some of the existing bicycle spaces provided near the Brewery Yard.

Figure 2.13: Bicycle ring on the eastern side of Chippendale Way

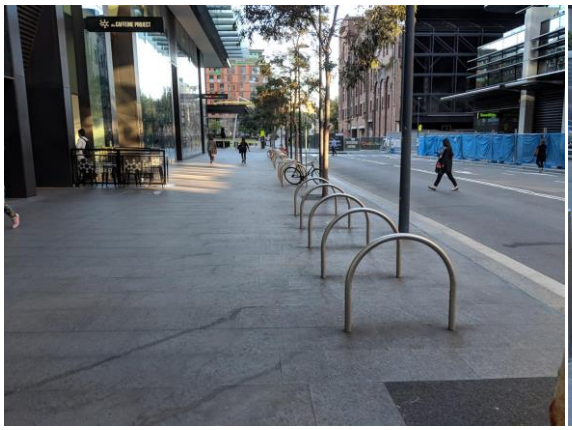
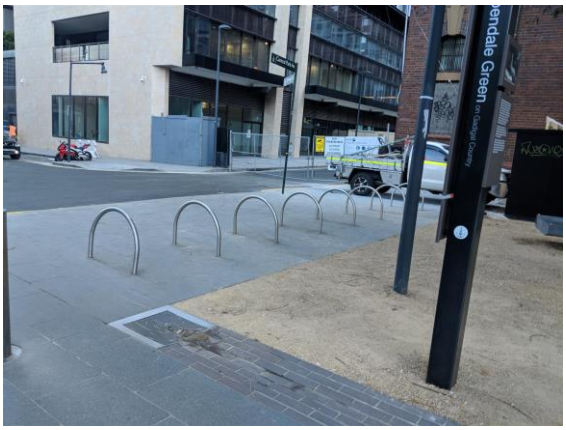


Figure 2.14: Bicycle parking located south of the site, along Central Park Avenue



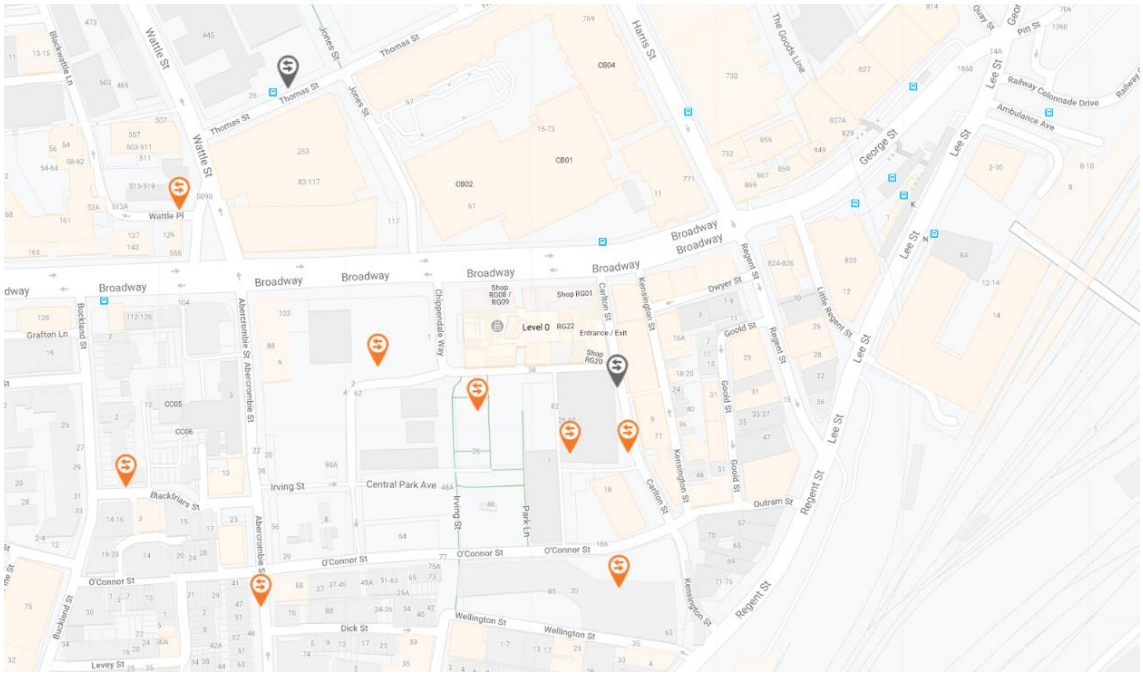
2.8 Local Car Sharing Initiatives

There are currently three on-street car sharing pod locations within the Central Park development and additional four on-street pod locations within reasonable walking distance of the site. There are two off-street 'SuperPods' located within basement car parks for Central Park Mall and Duo Apartments. The car sharing pods are located at:

- Carlton Street near Central Park Avenue (one pod)
- Carlton Street (two pods)
- Park Lane (four pods)
- Central Park Apartments SuperPod (32 pods)
- Duo Apartments SuperPod (10 pods)
- Abercrombie Street corner Dick Street (two pods)
- Thomas Street (one pod)
- Wattle Place (one pod)
- Blackfriars Street (two pods).

Figure 2.15 shows the locations of the car share pods, noting that some of the pods can accommodate more than one car share vehicle.

Figure 2.15: GoGet car share pods



Source: GoGet website retrieved 22 July 2019

2.9 Existing Travel Mode Choice

Given there is no mode of travel to work data available for Chippendale from the year 2016 Australian Bureau of Statistics (ABS), travel mode choice has been approximated from the nearest available travel data. As such, the mode of travel to employment areas in Haymarket was referenced and is included in Table 2.4.

Table 2.4: Year 2016 ABS - Method of travel to work

Mode	People working in Haymarket (per cent)
Train	53.4
Bus	20.4
Ferry	2.5
Tram	0.6
Taxi	0.6
Car - Driver	11.8
Car - Passenger	2.0
Truck	0.1
Motorcycle	0.9
Bicycle	1.4
Walking	6.0
Other	0.4

The results indicate that the highest mode choice is train. The percentage of employees travelling to work by train is about 53 per cent. In total, public transport has a combined mode share of around 77 per cent.

It is to be noted that there is a relatively low mode share for private vehicle as a driver (12 per cent) and passenger (two per cent). It is also noted that the active travel represents a total of seven per cent (one per cent cycling and six per cent walking).

The well-established footpaths and cycleways in Chippendale present opportunity to further manage/ reduce travel demands for the site.

3. Development Proposal

3.1 Land Uses

The proposed development involves alterations and additions to the existing heritage listed power station for commercial use (5,239 square metres GFA), with ancillary ground floor retail (1,147 square metres GFA).

3.2 Car Parking

The Brewery Yard will utilise 30 car parking spaces within the existing basement car parks of Block 1 (10 spaces) and Block 2 (20 spaces), which can be accessed via Abercrombie Street and O'Connor Street respectively. As indicated in Section 2.5, the 20 spaces contained in Block 2 have been constructed and are currently allocated for use by the Lot 305 Central Park Mall retail tenants. The reallocation of these spaces from Central Park Mall retail use to the Brewery Yard tenant/ users would not change the overall parking provision within the Central Park Precinct.

The car parking spaces will be for staff use only, noting that the Block 1 allocation is not permitted for public use.

In addition, a 12-metre long indented loading zone is proposed on the east side of Central Park Avenue. It is proposed that the loading zone has a 15-minute time restriction so that it can service the building and surrounding uses.

3.3 Pedestrian Facilities

Pedestrian access to the building is proposed via the southern and western frontages of the site.

3.4 Bicycle Facilities

The development plans do not show any bicycle parking and/ or end of trip facilities. It is understood these facilities will be incorporated into the design as part of a 'fit out' development application by future tenant(s).

4. Parking and Loading

4.1 LEP Car Parking Requirements

The car parking provision requirements for different development types are set out in Sydney LEP 2005. The rates outline the maximum allowable number of parking spaces within the development. The maximum car parking requirements for the proposed development is summarised in Table 4.1.

Table 4.1: LEP 2005 car parking requirements

Use	LEP parking rate	Size (m^2 GFA)	LEP parking requirement (spaces)
Retail	See below [1]	1,147 m^2	14
Office	See below [2]	5,239 m^2	64
Total		**6,386 m^2**	**78**

[1] Maximum retail parking = (Retail GFA x Site Area)/ (50 x Total GFA of Site) = (1,147*3,850)/ (50*6,386) = 13.83 (rounded up to 14)
[2] Maximum office parking = (Office GFA x Site Area)/ (50 x Total GFA of Site) = (5,239*3,850)/ (50*6,386) = 63.17 (rounded up to 64)

Table 4.1 indicates that the proposed development can provide up to 78 car parking spaces.

4.2 Disabled Car Parking Requirements

Sydney DCP 2012 states that:

Accessible parking is not required in car parking areas where a parking service is provided and direct access to any of the car parking spaces is not available to the general public or occupants.

The proposed car parking allocation will not be available to the public. On this basis, an accessible car parking spaces is not necessarily required for the proposed development.

4.3 Adequacy of Car Parking Supply

There are 30 car parking spaces to be used by the Brewery Yard, which is less than Sydney LEP 2005 maximum car parking requirements of 78 spaces.

4.4 Motorcycle Parking Requirements

Sydney DCP 2012 states that:

In all buildings that provide on-site parking, 1 motorcycle parking space for every 12 car parking spaces is to be provided as separate parking for motorcycles. Each motorcycle parking space is to be designated and located so that parked motorcycles are not vulnerable to being struck by a manoeuvring vehicle.

Based on the use of 30 car parking spaces for the proposed development, three motorcycle spaces are required as part of any future 'fit out' development application(s).

4.5 Loading Area

Parking for service vehicles would need to be provided for both the commercial and retail components of the development. The DCP 2012 requirements for service vehicle parking are set out in Table 4.2.

Table 4.2: Minimum service vehicle provisions

Land use	DCP rates	Size (GFA)	DCP requirement (spaces)
Retail	1 space per 350 m^2 GFA, or part thereof, up to 2,000 m^2	1,147 m^2	3
Commercial	1 space per 3,300 m^2 GFA, or part thereof, for the first 50,000 m^2	5,239 m^2	2
		Total	**5**

GTA's experience with calculating loading requirements for new commercial developments has shown the DCP 2012 rates generally result in an excessive recommended loading dock provision.

GTA's database of loading demand associated with specialty retail stores indicates that they typically receive an average of one delivery per day per tenant. Considering the ground floor retail area could result in one to two tenancies, this would likely result in two deliveries per day. Applying a 50 per cent continency results in up to three deliveries per day.

As for commercial tenancies, deliveries are typically by 99th percentile cars (including vans, utes etc.) unless there is a tenancy turnover or delivery of large furniture and appliances. Deliveries are typically couriers, postal and day-to-day business-related activity. All are generally infrequent.

Accounting for waste collection, which would typically occur three times of a week, the development could expect approximately five deliveries per day that require access to a loading facility, which is low activity.

A proposed dedicated indented loading zone with 30-minute time restriction during business hours (i.e. 8am to 6pm Monday to Friday) will facilitate any loading and waste collection activities required by the development. The proposed time restrictions would assist to facilitate turnover of deliveries during business hours; whilst allowing for removalist activities that may require extended time to occur at other times. The appropriate time restriction arrangement would be agreed with Council.

Having consideration of the proposed time restriction, the loading zone could accommodate up to 20 deliveries during business hours. Therefore, this loading arrangement is considered appropriate for the anticipated demand generated by the proposed development.

5. Sustainable Transport

5.1 Bicycle Parking

Sydney DCP 2012 requires minimum bicycle parking for staff and visitors as summarised in Table 5.1.

Table 5.1: DCP bicycle parking provision

Land use	Size (GFA)	User group	DCP parking rate	Provision
Retail	1,147 m²	Employees	1/ 250 m²	5
		Visitor	2+ 1/100 m² over 100 m²	12
Commercial/ office	5,239 m²	Employees	1/ 150 m²	35
		Visitor	1/ 400 m²	13
Total				17 Retail 48 Commercial/ office **65 Total**

Based on Table 5.1, the proposed development is required to provide a total of 65 bicycle spaces, including 40 spaces for employees within a secure end of trip facilities and 25 spaces for visitors, which could include spaces in the public domain.

Sydney DCP 2012 also requires the following end of trip facilities:

- 1 personal locker for each bicycle parking space
- 1 shower and change cubicle for up to 10 spaces
- 2 shower and change cubicles for 11-20 or more spaces
- 2 additional shower and change cubicles for each additional 20 spaces or part thereof.

On this basis, the following facilities are required as part of any future 'fit out' development application(s):

- 65 personal lockers
- 7 shower and change cubicles.

The site's location will connect well with surrounding shared paths through the Central Park precinct and surrounding cycling friendly roads as discussed in Section 2.7, largely linking with Pyrmont and nearby destinations including UTS and The University of Sydney.

5.2 Overview Green Travel Plan

5.2.1 Introduction

A Green Travel Plan (GTP) applicable to visitors and staff working on the site would be prepared prior to the occupation of the development to promote sustainable travel. This section provides a framework for the implementation of such a GTP.

Travel plan framework

Transport is a necessary part of life, but it has economic, public health and environmental consequences. The transport sector is one of the fastest growing emissions sectors in Australia, and therefore is one of the key opportunities for reducing greenhouse gases. As well as delivering better environmental outcomes, providing a range of travel choices with a focus on walking, cycling and public transport will have major public health benefits and will ensure a strong and prosperous community.

The physical infrastructure being provided as part of the development is only part of the solution. A GTP will ensure that the transport infrastructure, services and policies both within and external to

the site are tailored to the users and coordinated to achieve the most sustainable outcome possible.

What is a GTP?

A GTP 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 aims encourage and support people's aspirations for carrying out their daily business in a more sustainable way. Travel plans can provide measures to:

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

The GTP would promote the use of transport other than the private car and provide more sustainable and environmentally friendly choice for staff to travel to and from the site. There are a range of existing "non-car" transport options that are available at the site, which have been described in this report.

5.2.2 Key objectives

The aim of the GTP is to bring about better transport arrangements for living and working at the site. The key objectives of the GTP are to:

- encourage walking
- encourage cycling
- encourage the use of public transport
- reduce the use of the car, in particular single car occupancy
- encourage more efficient use of the car where car use is necessary.

It is the intention therefore, that the GTP will deliver the following benefits:

- enable higher public and active travel 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.

5.2.3 Site Specific Measures

The location of the site, in terms of its proximity to a wide range of sustainable transport including Central Railway Station and Central bus interchange, is a key attribute in the justification of the development. The GTP will then put in place measures to raise awareness and further influence the travel patterns of those people working or visiting the development with a view to encouraging modal shift away from cars.

The following potential measures and initiatives could be implemented to encourage more sustainable travel modes:

i Limiting onsite car parking provisions to proposed uses.
ii Create internal pedestrian and cyclist connections to the broader precinct to encourage cycling and walking.
iii Provide a Travel Access Guide (TAG), which would be given to all staff and available to all visitors. This document would be based on facilities available at the site would detail surrounding public transport services and active transport facilities. The TAG would be updated as the surrounding transport environment changes.
iv Providing public transport information boards to make staff and visitors more aware of the alternative transport options available (the format of such information boards would be based upon the TAG).

v Providing a car sharing pod on site or nearby and promoting the availability of car sharing pods for trips that require the use of private vehicles.
vi Providing bicycle facilities including secure bicycle parking for staff, bicycle racks/ rails for staff and visitors and shower and change room facilities.
vii Encouraging staff working on site that drive to work and park on surrounding roads to carpool together by creating a carpooling club or registry/ forum.
viii Regularly promoting ride/ walk to work days.
ix Providing a regular newsletter to all visitors and staff members bringing the latest news on sustainable travel initiatives in the area.

TAG

A TAG provides information to staff and visitors on how to travel to the site using sustainable transport modes such as walking and public transport. The information is presented visually in the form of a map showing the site location and nearby transport modes highlighting available pedestrian and cyclist routes. The information is usually presented as a brochure to be included in a welcome pack or on the back of company stationery and business cards.

Information and Communication

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

- TfNSW provides bus, train and ferry routes, timetables and journey planning through their Transport Info website: http://www.transportnsw.info.
- CoS provides a number of services and a range of information and events to encourage people of all levels of experience to travel by bicycle: http://www.cityofsydney.nsw.gov.au/explore/getting-around/cycling.

In addition, connecting staff and visitors via social media may provide a platform to informally pilot new programs or create travel-buddy networks and communication.

Monitoring the GTP

There is no standard methodology for monitoring the GTP, but it is suggested that it be monitored to ensure that it is achieving the desired benefits and modify it if required. It will not be possible at this stage to state what additional modifications might be made as this will be dependent upon circumstances prevailing at that time.

The GTP should be monitored on a regular basis, for example yearly, by carrying out travel surveys. Travel surveys will allow the most effective initiatives of the GTP to be identified, and conversely fewer effective initiatives can be modified or replaced to ensure the best outcomes are achieved. It will clearly be important to understand people's reasons for travelling the way they do, such as any barriers to changing their behaviour, and their propensity to change.

To ensure the successful implementation of the GTP, a Travel Plan Coordinator (TPC) should be appointed to ensure the successful implementation of the GTP. This could be the building manager or a member of the body corporate.

5.2.4 Summary

The proposed development should be required to develop and utilise a travel plan to increase the use of sustainable transport. Although it is difficult to predict what measures might be achievable until the proposed development is occupied, the above measures provide a framework for the development and implementation of a future travel plan for the site.

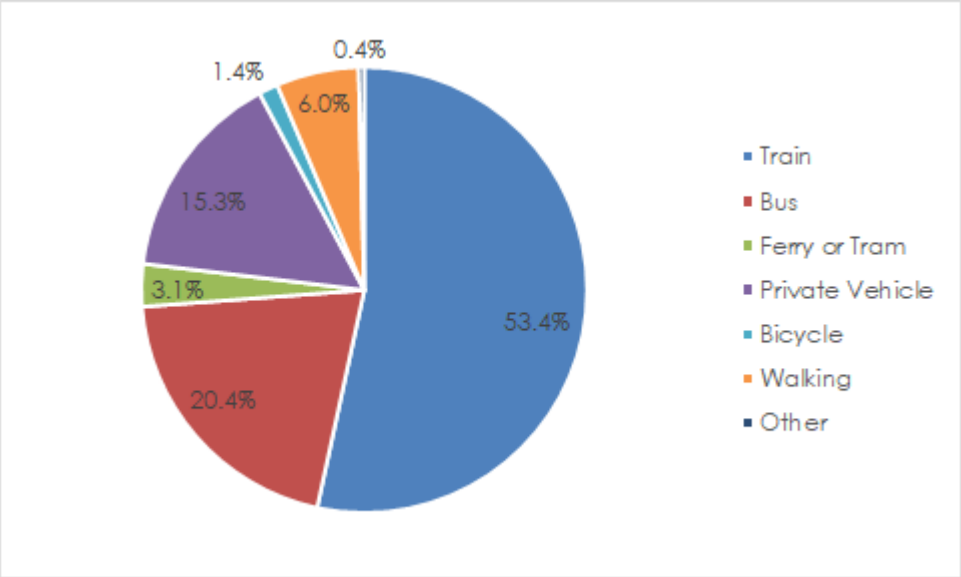
6. Transport Impact Assessment

6.1 Trip Generation

6.1.1 Mode Share

Mode share splits for the development have been estimated based on the 2016 Journey to Work data identified in Section 2.9. The mode share splits are summarised in Figure 6.1.

Figure 6.1: Mode split



6.1.2 Trip Generation

The population of the commercial component has been assumed by applying a conversion factor of one staff member per 20 square metres GFA, equating to 262 staff members for the proposal.

The anticipated travel demand by transport mode has been determined using the population of the proposed commercial and the mode share splits identified in Section 6.1.1. Given the ancillary nature of the ground floor retail, it is expected that trips generated by this use will be either linked trips associated with nearby residential, commercial and educational uses (i.e. not new/ additional trips to the external transport network); or trips generated by staff outside the peak periods. Therefore, the localised trips generated by the retail have not been included in this assessment.

Based on the above, the resulting travel demand for all trips during the peak hour is summarised in Table 6.1. It is noted that to provide a conservative estimate, it has been assumed that the full commercial population arrives in the peak hour, whereas in reality, arrivals to the site will be spread over a longer period (typically three hours).

Table 6.1: Peak hour trip generation per mode

Mode	Staff
Train	140
Bus	53
Ferry or Tram	8
Private Vehicle	40
Bicycle	4
Walking	16
Other	1
Total	**262**

[3] Results subject to rounding.

Table 6.1 indicates that the proposal would generate 40 trips by motor vehicle, 140 trips by train and 53 trips by bus. Motor vehicle trips include those as a car driver, car passenger, motorcycle rider, taxi or rideshare service.

Assuming staff will make two major trips per day, that is arriving to and departing the building, the daily trips by all modes of transport is summarised in Table 6.2. Small localised trips, such as leaving the facility to buy lunch, would not impact the external transport network, therefore have not been included in the assessment.

Table 6.2: Daily trip generation per mode

Mode	Staff
Train	280
Bus	106
Ferry or Tram	16
Private Vehicle	80
Bicycle	8
Walking	32
Other	2
Total	**524**

[1] Approved and proposed use results subject to rounding.

Table 6.2 indicates that the proposal would generate 80 trips by motor vehicles across a typical day, with an additional 280 and 106 trips daily by train and bus respectively. However, it is noted that these results reflect a 'worst-case' scenario where all staff arrive and depart in a peak hour.

6.2 Traffic Generation

6.2.1 Proposed Development

Notwithstanding the findings of this assessment, it is also acknowledged that there are 30 car parking spaces to be used by staff. Therefore, of the 40 vehicle trips generated by the proposed development in the peak hours, 30 vehicle trips will likely be generated to/ from the car parking spaces within the basements of Block 1 and 2 on the assumption that all staff travel to and depart the site in the peak hours.

The remaining vehicle trips (i.e. 10 vehicles trips) will either be as a passenger to/ from the site or staff parking on-street in any unrestricted locations further afield or in car park facilities such as:

- Interpark, Thomas Street, Ultimo (approximately a two-minute walk)

- Mercure Hotel Parking, Little Regent Street (approximately a five-minute walk)
- Hotel Novotel Sydney Central, 169-179 Thomas Street, Ultimo (approximately a nine-minute walk).

6.2.2 Other Approved Developments

At the time of the traffic surveys in July 2018, Blocks 1, 4 and 11 were under construction within the Central Park precinct and were previously assessed as part of the overall Central Park Master Plan.

The concept plan traffic assessment estimates for Blocks 1 and 4, including the previously approved use of the Brewery Yard, indicate these developments would generate a total of 117 vehicle movements in the peak hours.

Further to the above, the approved Block 11, which comprises of some 300 residential apartments and ancillary retail and child care facilities is estimated to generate some 100 vehicle movements in the peak hours.

As such, the combined traffic generation for the above-mentioned sites is estimated at 217 vehicle movements in the peak hours.

6.2.3 Summary

Peak hour trip generation per mode indicates the trips made by private vehicles for the proposed Brewery Yard would amount to 40 vehicle trips during any given peak. Of these trips, the 30 vehicle movements per hour will likely be generated by the car parking spaces to be used by the development within the Central Park precinct. It is expected that the remaining 10 vehicle trips made by private vehicle will be either as a passenger or using off-street and on-street parking facilities located in the broader area, therefore these trips will be dispersed within the surrounding road network.

The traffic generation associated with Blocks 1, 2, 4 and 11 (including the approved Brewery Yard scheme) have been previously assessed as part of the overall Central Park Master Plan, with the Brewery Yard anticipated to account for up to 30 vehicle trips of the combined traffic generation based on the car parking to be used by the development across these blocks.

6.3 Transport Impact

The existing road network operates satisfactorily, with the key intersections of Broadway/ Abercrombie Street and Broadway/ Chippendale Way operating with a level of service D or better in both the AM and PM peak hours. Although the southern approach on the Broadway/ Abercrombie Street intersection experiences a high average delay in the PM peak hour, vehicles were observed to clear within the allocated phase time.

The marginal increase of the traffic generated by the development in comparison to the existing traffic conditions is not expected to materially impact the function or safety of the road network.

Furthermore, the anticipated public transport, cyclist and pedestrian trips is not expected to result in any adverse effects to the public and active network infrastructure when considering that staff residences are across the Greater Sydney Metropolitan region therefore will disperse the trips across the broader network.

7. Construction Traffic Management

7.1 Introduction

This section sets out an overview and preliminary assessment of the construction, pedestrian and traffic management initiatives to be implemented as part of the construction of the proposed development.

The appointed contractor will be required to prepare a more detailed Construction Traffic Management Plan (CTMP), providing traffic and pedestrian management measures to be implementing during the construction of the proposed development. This CTMP will include, but not be limited to:

- construction vehicle access routes
- construction site access and circulation arrangements
- construction personnel parking provisions and management measures
- stage by stage construction traffic generation
- impact of construction activities on the surrounding transport network with consideration of pedestrians, cyclists, road network and surrounding properties
- mitigation and management measures to minimise the impact during construction.

A Traffic Guidance Scheme (TGS) would be prepared to accompany the detailed CTMP to appropriately manage traffic and pedestrians near the work site.

The overall principals of traffic management during construction include:

- minimising the impact on pedestrian movements
- maintaining appropriate public transport access
- minimising the impact to existing traffic on adjacent roads and intersections
- minimising the loss of on-street parking
- maintaining access to/ from any adjacent properties
- restricting construction vehicle movements to designated routes to/ from the site
- managing and controlling construction vehicle activity near the site
- ensuring construction activity is carried out in accordance with Council's approved hours of works.

7.2 Construction Details

7.2.1 Duration

Construction will be completed in stages to minimise disruption to local area facilities, with an anticipated duration of 15 to 18 months.

7.2.2 Anticipated Work Hours

Construction works will be carried out during the approved hours, which are anticipated to be as follows:

- 7:30am to 5:30pm on Monday to Friday
- 7:30am to 3:30pm on Saturday
- No work on Sundays or public holidays.

Safety inspections, pre-starts and inductions are expected to be permitted from 7:00am on work days. The contractor will be responsible for instructing and controlling all subcontractors

regarding the hours of work. Any work or deliveries required outside the approved construction hours will be subject to specific prior approval from CoS.

7.2.3 Construction Workers

It is anticipated that there will be a maximum of 240 workers on-site during peak construction activities.

There will be no on-site parking provided for construction workers. As the site is near frequent public transport services, specifically Central Railway Station, staff would be instructed to use public transport. Staff will not be permitted to park on public streets, with tool/ equipment drop-off arrangements made.

7.3 Site Access

It is expected that access to the construction site will occur from Central Park Avenue along the north and west frontages of the site.

All construction vehicle will be able to enter and exit the construction site in a forward direction. Accredited traffic controllers/ site personnel will manage and control construction vehicles, general traffic, pedestrians and cyclists at the site accesses. Priority will be given to through traffic, pedestrians and cyclists where practical. Appropriate signage will be implemented along Central Park Avenue and adjacent roads to inform general traffic of the truck accesses and traffic control. This signage will be illustrated on a TGS (also known as a traffic control plan) prepared prior to construction works commencing.

Construction vehicles will enter and exit from the surrounding road network (i.e. to/ from Central Park Avenue) under normal road rules giving way to all pedestrians and finding acceptable gaps in through traffic at priority-controlled intersections.

7.4 Anticipated Truck Movements

It is anticipated that the site would generate on average between 20 and 100 trucks per day (two-way), with up to 100 trucks per day (two-way) during peak construction activity.

The hourly traffic volumes would be in the order of 10 trucks per hour (two-way) during peak construction activity. This equates to a less than one per cent increase in traffic volumes along Broadway and Abercrombie Street. Based on this, the anticipated construction traffic volumes would not be expected to impact the surrounding road network.

7.5 Designated Truck Routes

The movement of all construction vehicles will be restricted to designated routes and confined to the regional road network. Designated routes have been identified with the aim of minimising impacts on the local road network.

The directional distribution and assignment of traffic generated by the construction works will be influenced by several factors, most notably the origin/ destination of materials, site access points and the configuration of the regional road network.

The approach and departure routes are illustrated in Figure 7.1 and Figure 7.2, respectively and includes the following:

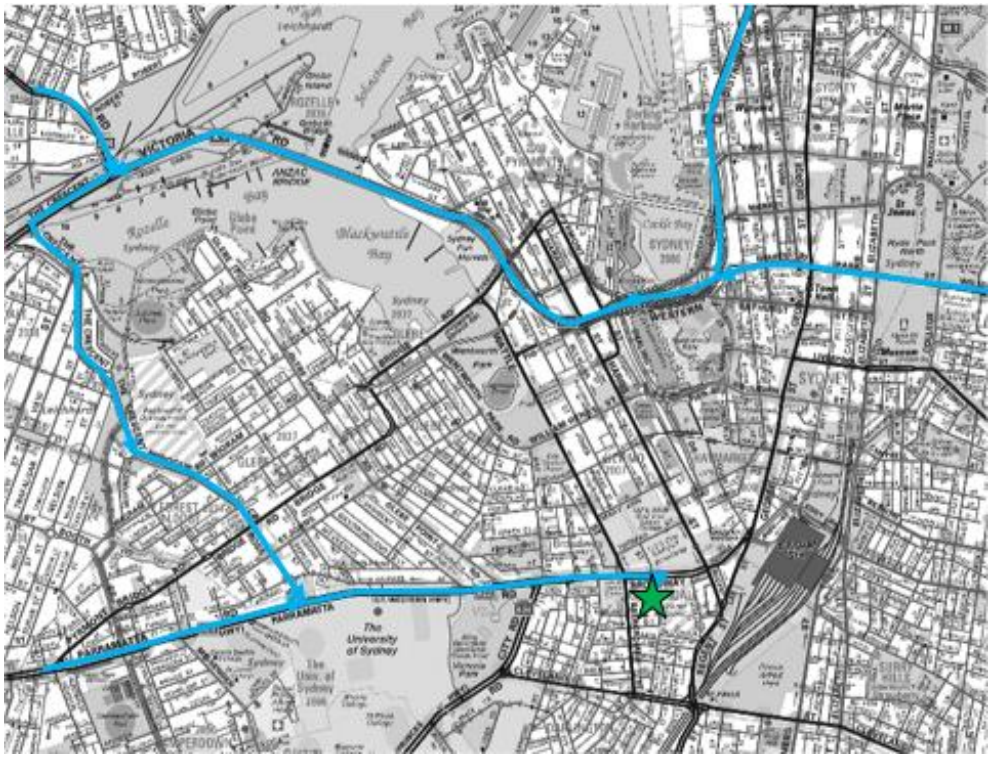
Approach routes:

- North:
  - Western Distributor, Anzac Bridge, Victoria Road, The Crescent, Minogue Crescent, Ross Street, Parramatta Road, Broadway, Chippendale Way and Central Park Avenue.
- West:
  - Parramatta Road, Broadway and Chippendale Way
  - Victoria Road, The Crescent, Minogue Crescent, Ross Street, Parramatta Road, Broadway, Chippendale Way and Central Park Avenue.
- South/ east:
  - Eastern Distributor, Cross City Tunnel, Western Distributor, Anzac Bridge, Victoria Road, The Crescent, Minogue Crescent, Ross Street, Parramatta Road, Broadway, Chippendale Way and Central Park Avenue.

Departure routes:

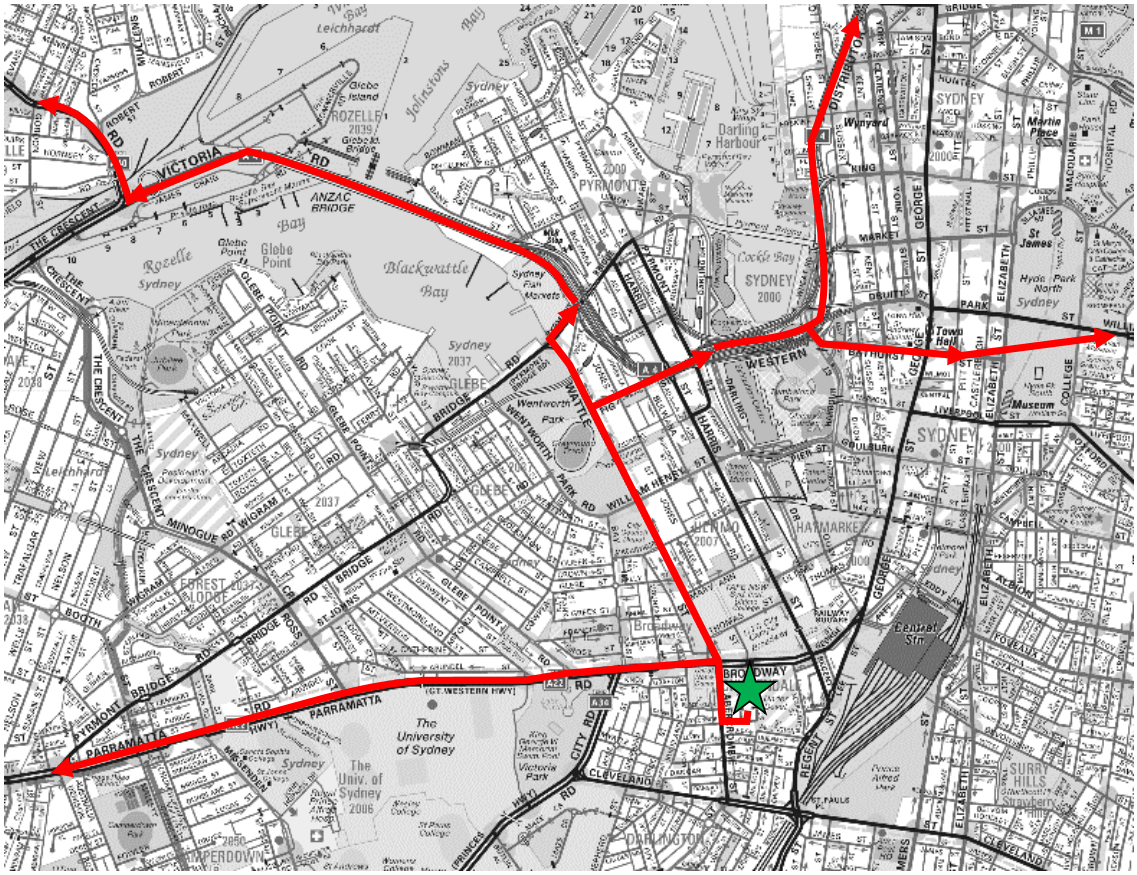
- North:
  - Central Park Avenue, O'Connor Street, Abercrombie Street/ Wattle Street, Fig Street and Western Distributor.
- West:
  - Central Park Avenue, O'Connor Street, Abercrombie Street/ Wattle Street, Pyrmont Bridge Road, Western Distributor and Victoria Road.
- South/ east:
  - Central Park Avenue, O'Connor Street, Abercrombie Street/ Wattle Street, Fig Street, Western Distributor, Cross City Tunnel and Eastern Distributor.

Figure 7.1: Construction traffic approach routes



Basemap source: Sydway Publishing Pty Ltd

Figure 7.2: Construction traffic departure routes



Basemap source: Sydway Publishing Pty Ltd

7.6 Construction Transport Impact

7.6.1 Pedestrian and Cyclist

Pedestrians and cyclist movements will be maintained adjacent to the site. Access routes to/ from Broadway and Abercrombie Street would be via signalised intersections therefore maintaining safety at these high pedestrian activity locations.

7.6.2 Public Transport

The work activities are not expected to impact existing public transport services near the site. This includes the operation of the bus stops in the immediate vicinity of the site.

7.6.3 Cumulative Impact

There are several other active or planned construction sites near the Brewery Yard and within the broader Sydney CBD that would likely be active during the construction period of the Brewery Yard redevelopment.

Notable projects near the site include:

- Central Park Block 4N – Completed
- Central Park Block 11 – Completed
- 37-47 O'Connor Street – Under construction
- UTS Central – Under construction.

The CSELR and Sydney Metro City and Southwest projects, which include work sites at Central Railway Station, would be the key construction projects in the Sydney CBD during the construction period.

TfNSW has limited the extent of east-west traffic impacts and concurrent intersection works during the construction period of the CSELR to minimise the impact on Sydney CBD traffic where possible. Nonetheless, the proposed construction vehicle routes for this Brewery Yard development avoid movements through the Sydney CBD and near Central Railway Station to limit interaction with these key construction projects and the many others within the Sydney CBD.

Given the low construction traffic volumes generated by the Brewery Yard construction activities (about two to 10 vehicles an hour), it is not expected the works will significantly contribute to the existing and future traffic conditions near the site and along the construction vehicle routes.

7.7 Emergency Access

Emergency vehicle access to, from and around the construction site would be maintained at all times. Liaison would be maintained with the police and emergency services agencies throughout the construction period and a 24-hour contact would be made available for 'out-of-hours' emergencies and access.

Emergency protocols on the site would include a requirement for the appointed contractor to assist with emergency access. Thus, there will be no adverse impacts to the provision of existing emergency vehicle access to other neighbouring properties as a result of the proposed construction activities.

8. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

i An SSDA is to be lodged for the proposed development at the existing Brewery Yard at Central Park in Chippendale. The proposal for the site includes 5,239 square metres GFA of commercial space with ancillary ground floor retail.

ii The Brewery Yard will use 30 existing parking spaces within the broader Central Park precinct which is less than the maximum parking requirement for the development of 78 spaces.

iii The proposal is required to provide a total of 65 bicycle spaces within a secure end of trip facilities.

iv Intersection analysis indicates that both the Broadway/ Abercrombie Street and Broadway/ Chippendale Way intersections currently operate with an acceptable level of service D or better in both the AM and PM peak hours.

v The development proposal generates 40 trips by motor vehicles in the peak hours.

vi Given the car parking to be used by the Brewery Yard will be 30 spaces, up to 30 vehicle movements will likely be generated to/ from the basement facilities of Block 1 and Block 2 in any given peak hour, with the remaining 10 vehicle movements expect to be dispersed across the road network to/ from other on-street and off-street car parking facilities.

vii Blocks 1, 4 and 11 were under construction at the time of the traffic surveys, however, have been assessed as part of the overall Central Park Master Plan, along with the approved scheme for the Brewery Yard.

viii The marginal increase of the traffic generated by the development is not expected to materially impact upon the function or safety of the existing road network.

ix The anticipated public transport, cyclist and pedestrian trips is also not expected to result in any adverse effects on the public and active network infrastructure when considering that staff residences are across the Greater Sydney Metropolitan region therefore will disperse the trips across the broader network.

x A GTP will be implemented to encourage the use of public and active transport modes.

xi An overview and preliminary assessment of the construction, pedestrian and traffic management initiatives has been identified to inform a more detailed CTMP to be prepared by the appointed contractor for implementation during the construction of the proposed development.

Appendix A

Survey Results

TTM Data

TTM Reference: 18SYD0124
Location: Broadway & Chippendale Way
Suburb: Chippendale
Date: Wednesday, 25 July 2018
Survey Duration: 0700-1000 & 1600-1900
AM Peak: 0800-0900
Weather: Fine
PM Peak: 1700-1800
Notes:

Time	Western Approach: Broadway														Southern Approach: Chippendale Way														Eastern Approach: Broadway													
15 min	Straight					Right					U Turn	TOTAL	Cycle	Peds	Left					Right					U Turn	TOTAL	Cycle	Peds	Left					Straight					U Turn	TOTAL	Cycle	Peds
time start	Light	Heavy	Bus	Total	Cycle	Light	Heavy	Bus	Total	Cycle					Light	Heavy	Bus	Total	Cycle	Light	Heavy	Bus	Total	Cycle					Light	Heavy	Bus	Total	Cycle	Light	Heavy	Bus	Total	Cycle				
7:00	237	15	16	**268**	2	18	1	0	**19**	0	0	**287**	**2**	1	4	0	0	**4**	0	2	0	0	**2**	0	0	**6**	**0**	25	2	0	0	**2**	0	150	6	11	**167**	0	0	**169**	**0**	23
7:15	250	10	22	**282**	4	15	2	1	**18**	0	0	**300**	**4**	6	6	0	0	**6**	0	4	0	0	**4**	0	0	**10**	**0**	42	1	0	0	**1**	0	175	6	14	**195**	0	0	**196**	**0**	25
7:30	313	13	33	**359**	3	15	2	0	**17**	0	0	**376**	**3**	3	1	0	0	**1**	0	2	0	1	**3**	0	0	**4**	**0**	52	2	0	0	**2**	0	221	13	13	**247**	1	0	**249**	**1**	30
7:45	280	14	28	**322**	5	18	1	0	**19**	1	0	**341**	**6**	16	5	1	0	**6**	0	3	0	0	**3**	0	0	**9**	**0**	61	0	0	0	**0**	0	212	8	17	**237**	0	0	**237**	**0**	68
8:00	328	12	33	**373**	6	20	1	0	**21**	0	0	**394**	**6**	12	1	0	0	**1**	0	2	0	0	**2**	0	0	**3**	**0**	90	2	0	0	**2**	0	196	10	21	**227**	2	0	**229**	**2**	84
8:15	270	9	36	**315**	5	9	1	0	**10**	0	0	**325**	**5**	14	5	0	0	**5**	0	2	0	0	**2**	0	0	**7**	**0**	108	5	0	0	**5**	1	241	15	19	**275**	2	0	**280**	**3**	102
8:30	264	15	37	**316**	5	30	1	0	**31**	0	0	**347**	**5**	18	1	0	0	**1**	0	1	0	0	**1**	0	0	**2**	**0**	108	2	1	1	**4**	0	207	8	19	**234**	8	0	**238**	**8**	141
8:45	288	10	35	**333**	4	20	3	0	**23**	2	0	**356**	**6**	24	6	1	0	**7**	0	2	0	0	**2**	0	0	**9**	**0**	103	6	0	0	**6**	0	235	13	27	**275**	1	0	**281**	**1**	112
9:00	236	10	27	**273**	3	19	2	0	**21**	0	0	**294**	**3**	17	7	0	0	**7**	0	0	0	0	**0**	0	0	**7**	**0**	84	2	0	0	**2**	0	244	6	27	**277**	2	0	**279**	**2**	87
9:15	248	8	34	**290**	1	14	0	0	**14**	0	0	**304**	**1**	13	3	0	0	**3**	0	1	1	0	**2**	0	0	**5**	**0**	108	1	0	0	**1**	0	237	15	20	**272**	1	0	**273**	**1**	87
9:30	230	13	20	**263**	3	17	0	0	**17**	0	0	**280**	**3**	13	3	0	0	**3**	0	2	0	0	**2**	0	0	**5**	**0**	96	1	0	0	**1**	0	233	15	31	**279**	0	0	**280**	**0**	87
9:45	193	16	26	**235**	1	15	1	0	**16**	0	0	**251**	**1**	21	6	0	0	**6**	0	0	0	0	**0**	0	0	**6**	**0**	77	3	0	0	**3**	0	204	20	16	**240**	1	0	**243**	**1**	97
TOTAL	**3137**	**145**	**347**	**3629**	**42**	**210**	**15**	**1**	**226**	**3**	**0**	**3855**	**45**	**158**	**48**	**2**	**0**	**50**	**0**	**21**	**1**	**1**	**23**	**0**	**0**	**73**	**0**	**954**	**27**	**1**	**1**	**29**	**1**	**2555**	**135**	**235**	**2925**	**18**	**0**	**2954**	**19**	**943**
AM Peak	1150	46	141	1337	20	79	6	0	85	2	0	1422	22	68	13	1	0	14	0	7	0	0	7	0	0	21	0	409	15	1	1	17	1	879	46	86	1011	13	0	1028	14	439
16:00	187	3	14	**204**	5	22	1	1	**24**	1	0	**228**	**6**	27	8	1	0	**9**	1	3	0	0	**3**	0	0	**12**	**1**	182	2	1	0	**3**	0	361	7	21	**389**	0	0	**392**	**0**	173
16:15	208	0	20	**228**	2	28	0	0	**28**	0	0	**256**	**2**	28	4	0	0	**4**	0	1	0	0	**1**	1	0	**5**	**1**	167	3	0	0	**3**	0	383	3	26	**412**	6	1	**416**	**6**	173
16:30	177	0	24	**201**	4	25	0	0	**25**	0	0	**226**	**4**	46	5	1	0	**6**	0	6	0	0	**6**	1	0	**12**	**1**	233	4	0	0	**4**	0	388	10	23	**421**	1	0	**425**	**1**	143
16:45	207	0	27	**234**	6	26	0	1	**27**	2	0	**261**	**8**	30	10	1	0	**11**	0	5	0	0	**5**	0	0	**16**	**0**	206	1	0	0	**1**	0	362	7	28	**397**	8	0	**398**	**8**	184
17:00	185	2	15	**202**	3	18	0	0	**18**	1	0	**220**	**4**	33	14	0	0	**14**	0	5	1	0	**6**	0	0	**20**	**0**	126	3	0	0	**3**	0	418	9	32	**459**	2	0	**462**	**2**	148
17:15	206	1	24	**231**	5	32	0	0	**32**	0	0	**263**	**5**	37	16	0	0	**16**	0	5	0	0	**5**	0	0	**21**	**0**	137	5	0	0	**5**	0	422	2	31	**455**	1	0	**460**	**1**	119
17:30	216	1	15	**232**	8	29	0	1	**30**	0	0	**262**	**8**	55	6	0	0	**6**	0	6	0	0	**6**	0	0	**12**	**0**	136	1	0	0	**1**	0	406	4	33	**443**	2	0	**444**	**2**	138
17:45	231	0	20	**251**	9	33	0	0	**33**	0	0	**284**	**9**	52	8	0	0	**8**	0	3	0	0	**3**	0	0	**11**	**0**	89	4	0	0	**4**	0	414	2	28	**444**	6	0	**448**	**6**	140
18:00	196	1	16	**213**	5	29	0	0	**29**	3	0	**242**	**8**	16	8	0	0	**8**	1	4	0	0	**4**	0	0	**12**	**1**	111	4	0	0	**4**	0	322	1	29	**352**	1	0	**356**	**1**	143
18:15	191	1	12	**204**	2	28	0	0	**28**	0	1	**233**	**2**	27	12	0	0	**12**	0	3	0	0	**3**	0	0	**15**	**0**	105	3	0	0	**3**	0	366	4	38	**408**	3	0	**411**	**3**	129
18:30	216	1	18	**235**	5	27	0	0	**27**	1	0	**262**	**6**	16	7	0	0	**7**	0	9	0	0	**9**	0	0	**16**	**0**	83	5	0	0	**5**	0	429	1	25	**455**	1	0	**460**	**1**	130
18:45	202	2	17	**221**	2	40	0	0	**40**	1	0	**261**	**3**	26	13	0	0	**13**	0	10	0	0	**10**	0	0	**23**	**0**	102	14	0	0	**14**	0	261	1	18	**280**	6	0	**294**	**6**	101
TOTAL	**2422**	**12**	**222**	**2656**	**56**	**337**	**1**	**3**	**341**	**9**	**1**	**2998**	**65**	**393**	**111**	**3**	**0**	**114**	**2**	**60**	**1**	**0**	**61**	**2**	**0**	**175**	**4**	**1677**	**49**	**1**	**0**	**50**	**0**	**4532**	**51**	**332**	**4915**	**37**	**1**	**4966**	**37**	**1721**
PM Peak	838	4	74	916	25	112	0	1	113	1	0	1029	26	177	44	0	0	44	0	19	1	0	20	0	0	64	0	488	13	0	0	13	0	1660	17	124	1801	11	0	1814	11	545

TTM Data

TTM Reference: 18SYD0124
Location: Broadway & Wattle St
Suburb: Chippendale
Date: Wednesday, 25 July 2018
Survey Duration: 0700-1000 & 1600-1900
AM Peak: 0800-0900
Weather: Fine
PM Peak: 1700-1800
Notes:

Time	Northern Approach: Wattle St																			Southern Approach: Abercrombie St																		
15 min	Left					Straight					Right					U Turn	TOTAL	Cycle	Peds	Left					Straight					Right					U Turn	TOTAL	Cycle	Peds
time start	Light	Heavy	Bus	**Total**	Cycle	Light	Heavy	Bus	**Total**	Cycle	Light	Heavy	Bus	**Total**	Cycle					Light	Heavy	Bus	**Total**	Cycle	Light	Heavy	Bus	**Total**	Cycle	Light	Heavy	Bus	**Total**	Cycle				
7:00	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	19	12	3	0	**15**	0	330	18	2	**350**	0	4	2	0	**6**	0	0	**371**	**0**	24
7:15	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	31	17	2	0	**19**	0	344	16	1	**361**	5	4	1	0	**5**	0	0	**385**	**5**	34
7:30	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	59	14	1	0	**15**	0	295	12	2	**309**	1	4	0	0	**4**	0	0	**328**	**1**	42
7:45	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	75	15	2	0	**17**	0	342	16	1	**359**	4	2	0	0	**2**	0	0	**378**	**4**	62
8:00	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	100	8	2	0	**10**	0	331	20	0	**351**	9	1	1	1	**3**	0	0	**364**	**9**	66
8:15	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	172	16	2	0	**18**	0	386	12	0	**398**	5	9	2	0	**11**	0	0	**427**	**5**	72
8:30	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	134	25	3	0	**28**	0	360	15	2	**377**	7	14	1	0	**15**	1	0	**420**	**8**	68
8:45	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	171	17	1	0	**18**	0	310	14	1	**325**	4	10	1	0	**11**	2	0	**354**	**6**	74
9:00	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	1	0	**0**	**1**	134	27	2	0	**29**	0	349	9	1	**359**	12	7	2	0	**9**	0	0	**397**	**12**	45
9:15	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	124	15	3	0	**18**	0	255	17	1	**273**	1	4	0	0	**4**	0	0	**295**	**1**	75
9:30	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	140	22	2	1	**25**	0	281	18	2	**301**	1	14	1	1	**16**	0	0	**342**	**1**	58
9:45	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	142	14	3	0	**17**	0	297	23	1	**321**	3	10	0	0	**10**	0	0	**348**	**3**	45
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1301**	**202**	**26**	**1**	**229**	**0**	**3880**	**190**	**14**	**4084**	**52**	**83**	**11**	**2**	**96**	**3**	**0**	**4409**	**55**	**665**
AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	577	66	8	0	74	0	1387	61	3	1451	25	34	5	1	40	3	0	1565	28	280
16:00	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	173	27	1	0	**28**	0	330	13	3	**346**	1	9	1	0	**10**	0	0	**384**	**1**	88
16:15	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	266	20	1	0	**21**	0	303	10	1	**314**	0	10	0	0	**10**	1	0	**345**	**1**	126
16:30	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	214	32	0	0	**32**	0	371	4	1	**376**	1	14	0	0	**14**	0	0	**422**	**1**	129
16:45	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	199	29	1	0	**30**	0	362	1	1	**364**	0	7	0	0	**7**	2	0	**401**	**2**	106
17:00	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	5	0	**0**	**5**	252	28	0	0	**28**	0	406	2	0	**408**	1	2	0	0	**2**	0	0	**438**	**1**	108
17:15	0	0	0	**0**	0	0	0	0	**0**	2	0	0	0	**0**	1	0	**0**	**3**	287	32	1	0	**33**	1	364	2	0	**366**	0	2	0	0	**2**	0	0	**401**	**1**	126
17:30	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	232	30	0	0	**30**	0	395	4	1	**400**	0	11	0	0	**11**	0	0	**441**	**0**	132
17:45	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	3	0	**0**	**3**	189	29	0	0	**29**	0	330	3	0	**333**	4	17	0	0	**17**	0	0	**379**	**4**	96
18:00	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	239	13	0	0	**13**	0	325	3	1	**329**	3	11	0	0	**11**	0	0	**353**	**3**	109
18:15	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	258	32	1	0	**33**	0	385	4	1	**390**	1	17	0	0	**17**	0	0	**440**	**1**	89
18:30	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	288	21	0	0	**21**	0	354	1	2	**357**	0	16	0	0	**16**	0	0	**394**	**0**	73
18:45	0	0	0	**0**	0	0	0	0	**0**	0	0	0	0	**0**	0	0	**0**	**0**	177	23	2	0	**25**	0	318	3	1	**322**	0	18	0	0	**18**	0	0	**365**	**0**	96
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**11**	**2774**	**316**	**7**	**0**	**323**	**1**	**4243**	**50**	**12**	**4305**	**11**	**134**	**1**	**0**	**135**	**3**	**0**	**4763**	**15**	**1278**
PM Peak	0	0	0	0	0	0	0	0	0	2	0	0	0	0	9	0	0	11	960	119	1	0	120	1	1495	11	1	1507	5	32	0	0	32	0	0	1659	6	462

TTM Data

TTM Reference: 18SYD0124
Location: Broadway & Wattle St
Suburb: Chippendale
Date: Wednesday, 25 July 2018
Survey Duration: 0700-1000 & 1600-1900
Weather: Fine
Notes:

AM Peak: 0800-0900
PM Peak: 1700-1800

Time	Eastern Approach: Broadway																			Western Approach: Broadway																		
15 min	Left					Straight					Right					U Turn	TOTAL	Cycle	Peds	Left					Straight					Right					U Turn	TOTAL	Cycle	Peds
time start	Light	Heavy	Bus	Total	Cycle	Light	Heavy	Bus	Total	Cycle	Light	Heavy	Bus	Total	Cycle					Light	Heavy	Bus	Total	Cycle	Light	Heavy	Bus	Total	Cycle	Light	Heavy	Bus	Total	Cycle				
7:00	0	0	0	**0**	0	156	7	10	**173**	0	0	0	1	**1**	0	0	**174**	**0**	2	150	16	1	**167**	0	250	18	16	**284**	1	0	0	0	**0**	0	0	**451**	**1**	5
7:15	0	0	0	**0**	0	177	6	14	**197**	0	0	0	0	**0**	0	0	**197**	**0**	12	173	12	0	**185**	1	272	13	23	**308**	2	0	0	0	**0**	0	0	**493**	**3**	6
7:30	0	0	0	**0**	0	226	12	12	**250**	1	0	0	1	**1**	0	0	**251**	**1**	7	211	10	0	**221**	0	325	13	32	**370**	1	0	0	0	**0**	0	0	**591**	**1**	14
7:45	0	0	0	**0**	0	209	9	15	**233**	2	0	0	1	**1**	0	0	**234**	**2**	20	202	9	0	**211**	1	308	16	28	**352**	3	0	0	0	**0**	0	0	**563**	**4**	14
8:00	0	0	0	**0**	0	189	9	20	**218**	2	1	0	2	**3**	0	0	**221**	**2**	26	188	4	0	**192**	5	338	14	31	**383**	1	0	0	0	**0**	0	0	**575**	**6**	29
8:15	0	0	0	**0**	0	255	15	18	**288**	2	0	0	1	**1**	0	0	**289**	**2**	21	189	13	0	**202**	5	276	10	36	**322**	2	0	0	0	**0**	0	0	**524**	**7**	39
8:30	0	0	0	**0**	0	207	9	18	**234**	5	0	0	0	**0**	0	0	**234**	**5**	32	182	3	0	**185**	2	273	13	38	**324**	3	0	0	0	**0**	0	0	**509**	**5**	43
8:45	0	0	0	**0**	0	246	12	27	**285**	1	0	0	1	**1**	0	0	**286**	**1**	23	201	10	0	**211**	8	316	11	35	**362**	4	0	0	0	**0**	0	0	**573**	**12**	39
9:00	0	0	0	**0**	0	251	8	24	**283**	3	4	1	2	**7**	0	0	**290**	**3**	33	159	12	0	**171**	1	252	9	27	**288**	2	0	0	0	**0**	0	0	**459**	**3**	63
9:15	0	0	0	**0**	0	241	15	20	**276**	3	1	0	0	**1**	0	0	**277**	**3**	23	153	20	0	**173**	0	249	9	34	**292**	1	0	0	0	**0**	0	0	**465**	**1**	42
9:30	0	0	0	**0**	0	243	14	27	**284**	0	4	2	2	**8**	0	0	**292**	**0**	14	136	11	0	**147**	2	231	13	20	**264**	0	0	0	0	**0**	0	0	**411**	**2**	29
9:45	0	0	0	**0**	0	200	20	14	**234**	1	2	0	2	**4**	0	0	**238**	**1**	31	143	10	0	**153**	3	194	20	26	**240**	2	0	0	0	**0**	0	0	**393**	**5**	30
TOTAL	**0**	**0**	**0**	**0**	**0**	**2600**	**136**	**219**	**2955**	**20**	**12**	**3**	**13**	**28**	**0**	**0**	**2983**	**20**	**244**	**2087**	**130**	**1**	**2218**	**28**	**3284**	**159**	**346**	**3789**	**22**	**0**	**0**	**0**	**0**	**0**	**0**	**6007**	**50**	**353**
AM Peak	0	0	0	0	0	897	45	83	1025	10	1	0	4	5	0	0	1030	10	102	760	30	0	790	20	1203	48	140	1391	10	0	0	0	0	0	0	2181	30	150
16:00	0	0	0	**0**	0	345	8	23	**376**	5	0	0	2	**2**	0	0	**378**	**5**	38	99	3	1	**103**	4	185	3	14	**202**	3	0	0	0	**0**	0	0	**305**	**7**	51
16:15	0	0	1	**1**	0	405	2	24	**431**	11	0	0	2	**2**	0	0	**434**	**11**	35	121	6	2	**129**	4	226	0	20	**246**	1	0	0	0	**0**	0	0	**375**	**5**	45
16:30	0	1	0	**1**	0	375	10	20	**405**	8	0	0	3	**3**	0	0	**409**	**8**	35	116	1	0	**117**	1	192	0	24	**216**	1	0	0	0	**0**	0	0	**333**	**2**	63
16:45	0	0	0	**0**	0	380	6	28	**414**	10	1	0	1	**2**	0	0	**416**	**10**	37	136	3	1	**140**	0	216	0	29	**245**	3	0	0	0	**0**	0	0	**385**	**3**	59
17:00	0	0	0	**0**	0	416	8	28	**452**	7	1	0	4	**5**	0	0	**457**	**7**	40	140	4	0	**144**	0	202	1	16	**219**	3	0	0	0	**0**	0	0	**363**	**3**	73
17:15	0	0	0	**0**	0	463	2	28	**493**	11	3	0	3	**6**	0	0	**499**	**11**	52	124	0	1	**125**	0	228	1	25	**254**	3	0	0	0	**0**	0	0	**379**	**3**	70
17:30	0	0	0	**0**	0	400	4	28	**432**	10	0	0	2	**2**	0	0	**434**	**10**	43	120	0	0	**120**	0	238	3	15	**256**	9	0	0	0	**0**	0	0	**376**	**9**	97
17:45	0	0	0	**0**	0	412	3	29	**444**	10	1	0	1	**2**	0	0	**446**	**10**	50	133	2	0	**135**	0	246	1	19	**266**	10	0	0	0	**0**	0	0	**401**	**10**	75
18:00	0	0	0	**0**	0	366	0	27	**393**	10	1	1	3	**5**	0	0	**398**	**10**	40	115	0	1	**116**	0	217	1	15	**233**	4	0	0	0	**0**	0	0	**349**	**4**	64
18:15	0	0	0	**0**	0	386	3	36	**425**	10	0	0	1	**1**	0	0	**426**	**10**	29	85	0	0	**85**	0	206	1	11	**218**	1	0	0	0	**0**	0	0	**303**	**1**	86
18:30	0	0	0	**0**	0	452	2	24	**478**	6	1	0	1	**2**	0	0	**480**	**6**	24	109	3	0	**112**	0	227	1	17	**245**	0	0	0	0	**0**	0	0	**357**	**0**	56
18:45	0	0	0	**0**	0	284	0	19	**303**	10	0	0	1	**1**	1	0	**304**	**11**	60	115	0	0	**115**	1	217	3	16	**236**	1	0	0	0	**0**	0	0	**351**	**2**	37
TOTAL	**0**	**1**	**1**	**2**	**0**	**4684**	**48**	**314**	**5046**	**108**	**8**	**1**	**24**	**33**	**1**	**0**	**5081**	**109**	**483**	**1413**	**22**	**6**	**1441**	**10**	**2600**	**15**	**221**	**2836**	**39**	**0**	**0**	**0**	**0**	**0**	**0**	**4277**	**49**	**776**
PM Peak	0	0	0	0	0	1691	17	113	1821	38	5	0	10	15	0	0	1836	38	185	517	6	1	524	0	914	6	75	995	25	0	0	0	0	0	0	1519	25	315

Appendix B

SIDRA Intersection Results

MOVEMENT SUMMARY

Site: 1 [1 Broadway/ Abercrombie AM EX]

Network: N101 [AM Network Existing]

Signals - Fixed Time Coordinated Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Abercrombie Street													
1	L2	78	10.8	78	10.8	0.879	52.2	LOS D	26.7	196.2	0.90	0.95	17.9
2	T1	1422	4.7	1422	4.7	0.879	47.5	LOS D	36.2	263.5	0.93	0.97	21.8
3	R2	42	15.0	42	15.0	0.068	30.8	LOS C	1.6	12.5	0.68	0.68	16.1
Approach		1542	5.3	1542	5.3	0.879	47.2	LOS D	36.2	263.5	0.93	0.96	21.5
East: Broadway													
5	T1	1079	12.5	1079	12.5	0.328	3.2	LOS A	3.1	22.7	0.13	0.12	43.5
6	R2	4	100.0	4	100.0	0.050	33.3	LOS C	0.2	2.2	0.67	0.65	23.9
Approach		1083	12.8	1083	12.8	0.328	3.3	LOS A	3.1	22.7	0.14	0.12	43.3
West: Broadway													
10	L2	832	3.8	832	3.8	0.862	35.6	LOS C	45.5	329.2	0.94	0.93	25.5
11	T1	1464	13.5	1464	13.5	0.511	19.1	LOS B	18.1	141.3	0.69	0.62	20.7
Approach		2296	10.0	2296	10.0	0.862	25.1	LOS B	45.5	329.2	0.78	0.73	23.3
All Vehicles		4921	9.2	4921	9.2	0.879	27.2	LOS B	45.5	329.2	0.68	0.67	24.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.2 %
Number of Iterations: 5 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	295	18.4	LOS B	0.6	0.6	0.56	0.56
P2	East Full Crossing	107	41.9	LOS E	0.3	0.3	0.84	0.84
P3	North Full Crossing	607	18.6	LOS B	1.2	1.2	0.56	0.56
P4	West Full Crossing	158	38.7	LOS D	0.4	0.4	0.81	0.81
P4S	West Slip/Bypass Lane Crossing	158	25.5	LOS C	0.4	0.4	0.65	0.65
All Pedestrians		1325	23.7	LOS C			0.62	0.62

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 2 [2 Broadway/ Chippendale AM EX]

Network: N101 [AM Network Existing]

Signals - Fixed Time Coordinated Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Chippendale Way													
1	L2	15	7.1	15	7.1	0.022	28.7	LOS C	0.5	4.0	0.65	0.65	7.1
3	R2	7	0.0	7	0.0	0.019	44.0	LOS D	0.3	2.4	0.82	0.65	14.0
Approach		22	4.8	22	4.8	0.022	33.8	LOS C	0.5	4.0	0.71	0.65	10.4
East: Broadway													
4	L2	18	11.8	18	11.8	0.162	18.7	LOS B	3.0	36.5	0.51	0.45	25.2
5	T1	1064	13.1	1064	13.1	0.322	16.5	LOS B	10.5	76.8	0.60	0.52	22.2
Approach		1082	13.0	1082	13.0	0.322	16.5	LOS B	10.5	76.8	0.59	0.52	22.3
West: Broadway													
11	T1	1407	14.0	1407	14.0	0.315	2.6	LOS A	9.2	66.8	0.14	0.13	44.6
12	R2	89	7.1	89	7.1	0.194	7.9	LOS A	0.7	5.4	0.16	0.55	29.0
Approach		1497	13.6	1497	13.6	0.315	2.9	LOS A	9.2	66.8	0.15	0.15	43.7
All Vehicles		2601	13.3	2601	13.3	0.322	8.8	LOS A	10.5	76.8	0.34	0.31	33.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.2 %
Number of Iterations: 5 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	431	16.8	LOS B	0.8	0.8	0.53	0.53
P2	East Full Crossing	462	55.2	LOS E	1.5	1.5	0.97	0.97
P4	West Full Crossing	72	54.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		964	38.0	LOS D			0.77	0.77

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 1 [1 Broadway/ Abercrombie PM EX]

Network: N101 [PM Network Existing]

Signals - Fixed Time Coordinated Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Abercrombie Street													
1	L2	126	0.8	126	0.8	0.988	88.7	LOS F	39.7	279.5	0.91	1.20	12.0
2	T1	1586	0.8	1586	0.8	0.988	83.4	LOS F	57.8	407.6	0.95	1.24	15.3
3	R2	34	0.0	34	0.0	0.048	29.7	LOS C	1.2	8.6	0.66	0.67	16.4
Approach		1746	0.8	1746	0.8	0.988	82.8	LOS F	57.8	407.6	0.94	1.22	15.1
East: Broadway													
5	T1	1917	7.1	1917	7.1	0.601	5.6	LOS A	8.6	60.5	0.27	0.24	39.8
6	R2	11	100.0	11	100.0	0.055	31.4	LOS C	0.4	5.4	0.70	0.67	24.7
Approach		1927	7.6	1927	7.6	0.601	5.8	LOS A	8.6	60.5	0.27	0.24	39.4
West: Broadway													
10	L2	552	1.3	552	1.3	0.766	38.8	LOS D	28.2	199.4	0.93	0.87	24.4
11	T1	1047	8.1	1047	8.1	0.481	29.2	LOS C	15.2	114.0	0.80	0.70	15.7
Approach		1599	5.8	1599	5.8	0.766	32.5	LOS C	28.2	199.4	0.85	0.76	19.9
All Vehicles		5273	4.8	5273	4.8	0.988	39.4	LOS D	57.8	407.6	0.67	0.72	20.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.4 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	486	19.1	LOS B	0.9	0.9	0.57	0.57
P2	East Full Crossing	195	41.2	LOS E	0.6	0.6	0.83	0.83
P3	North Full Crossing	1011	30.0	LOS C	2.5	2.5	0.72	0.72
P4	West Full Crossing	332	38.1	LOS D	0.9	0.9	0.80	0.80
P4S	West Slip/Bypass Lane Crossing	332	25.1	LOS C	0.7	0.7	0.65	0.65
All Pedestrians		2355	29.1	LOS C			0.70	0.70

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 2 [2 Broadway/ Chippendale PM EX]

Network: N101 [PM Network Existing]

Signals - Fixed Time Coordinated Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Chippendale Way													
1	L2	46	0.0	46	0.0	0.071	31.4	LOS C	1.8	12.5	0.70	0.69	6.5
3	R2	21	5.0	21	5.0	0.056	44.7	LOS D	1.0	7.2	0.83	0.69	13.9
Approach		67	1.6	67	1.6	0.071	35.5	LOS D	1.8	12.5	0.74	0.69	9.8
East: Broadway													
4	L2	14	0.0	14	0.0	0.210	17.3	LOS B	3.9	47.9	0.50	0.43	26.4
5	T1	1896	7.8	1896	7.8	0.544	17.5	LOS B	21.5	151.8	0.67	0.60	21.5
Approach		1909	7.8	1909	7.8	0.544	17.4	LOS B	21.5	151.8	0.67	0.60	21.5
West: Broadway													
11	T1	964	8.5	964	8.5	0.217	0.6	LOS A	0.6	4.0	0.03	0.03	48.7
12	R2	119	0.9	119	0.9	0.400	29.5	LOS C	5.5	38.7	0.82	0.80	14.8
Approach		1083	7.7	1083	7.7	0.400	3.7	LOS A	5.5	38.7	0.12	0.11	41.9
All Vehicles		3060	7.6	3060	7.6	0.544	13.0	LOS B	21.5	151.8	0.48	0.43	27.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.4 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	514	15.3	LOS B	0.9	0.9	0.51	0.51
P2	East Full Crossing	574	55.5	LOS E	1.9	1.9	0.97	0.97
P4	West Full Crossing	186	54.6	LOS E	0.6	0.6	0.96	0.96
All Pedestrians		1274	39.2	LOS D			0.78	0.78

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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