GTAconsultants

Walsh Bay Arts Precinct Stage 2 SSDA Transport Impact Assessment

Client // Infrastructure NSW
Office // NSW
Reference // 16S1426000
Date // 14/11/16

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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 currently being prepared for the redevelopment of the Walsh Bay Arts Precinct. The redevelopment includes the refurbishment of Wharf 4/5 and the construction of new arts uses within Pier 2/3. The proposed redevelopment is anticipated to significantly increase visitation to the broader Walsh Bay precinct.

GTA Consultants (GTA) completed a Traffic Management and Accessibility Plan (TMAP) for Arts NSW dated 14 January 2015 as part of the Stage 1 SSDA. GTA was commissioned by Infrastructure NSW in March 2016 to provide transport advice and documentation for the Stage 2 SSDA, including a Transport Impact Assessment (TIA) for the Walsh Bay Arts Precinct. Arts NSW maintains responsibility for strategic and design outcomes, along with stakeholder management, whilst Infrastructure NSW is responsible for project delivery.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

i Existing traffic and parking conditions surrounding the site
ii Suitability of the proposed parking in terms of supply (quantum) and layout
iii Service vehicle requirements
iv Pedestrian and bicycle requirements
v The traffic generating characteristics of the proposed development
vi Suitability of the proposed access arrangements for the site
vii The transport impact of the development proposal on the surrounding road network.

This study has also addressed the Stage 1 SSDA Development Consent issued on 21 May 2015 (SSD 6069) and the Secretary's Environmental Assessment Requirements (SEAR's) issued on 1 July 2016 (SSD 7689) for the WBAP.

The transport and accessibility requirements set out in the consent conditions are detailed in Table 1.1.

Table 1.1: SSDA and SEARs Requirements

Consent	Consent Description	Relevant Section
SSDA Consent Condition No. 17 **(Transport Impact Assessment)**	The future development application for the adaptive re-use of Pier 2/3 shall be accompanied by a Transport Impact Assessment. The mode share targets and recommendations in Sections 5 and 10 of TMAP prepared by GTA are to be addressed in the TIA.	The following report details the WBAP *Transport Impact Assessment* with reference to the TMAP.
SSDA Consent Condition No. 18 **(Transport Management Plan)**	All future Category 1 to 4 events are to be undertaken in accordance with a Transport Management Plan. The TMP is to be prepared in consultation with the Walsh Bay Working Group (Authorities Group), NSW Police, Council, Transport for NSW and Transport Management Centre.	See *WBAP Event Transport Management Plan,*
SSDA Consent Condition No. 19 **(Green Travel Plan and Transport Access Guide)**	The first development application for adaptive reuse of Pier 2/3 or 4/5 shall be accompanied by a Green Travel Plan and a Transport Access Guide prepared by a suitably qualified consultant which applies to entire WBAP and which encourages sustainable transport options.	See *WBAP Green Travel Plan*
SEARs No. 10 **(Transport and Accessibility)**	The EIS shall include a Traffic Impact Assessment (TIA) relating to construction and operational impacts that includes, but is not limited to the following:	
	Construction	
	○ an assessment of traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrians, cyclists, harbour vessel movements, and public transport operations, including the preparation of a draft Construction Pedestrian Traffic Management Plan.	See *WBAP Construction Pedestrian Traffic Management Plan (CTMP)*
	○ an assessment of cumulative impacts associated with other construction activities;	See Section 3.6 of the WBAP CTMP
	○ detail construction vehicle routes, peak hour and daily truck movements, access arrangements and traffic control measures at all stages of construction;	See Section 3 and 4 of the WBAP CTMP
	○ an assessment of construction impacts on road safety at key intersections; and	See Section 3 and 4 of the WBAP CTMP
	○ detail access arrangements for workers, emergency services and the provision of safe and efficient access for loading and deliveries.	See Section 3 and 4 of the WBAP CTMP
	Operation	
	○ provide accurate details of the daily and peak hour vehicle, public transport, pedestrian and bicycle movements, existing traffic and transport facilities and assess the impacts of anticipated traffic generation on: o the local road network and intersection capacity; o the operation of existing and future transport networks including the light rail, ferry and bus networks; and o planned and approved developments in the area including Barangaroo	Section 7 and 5.3 of this report
	○ detail the provision of vehicle, pedestrian, bicycle, motor cycle, taxi, bus access and parking, integration with existing transport networks and assess the adequacy of public transport to meet the future demand of the proposed development;	Section 4, 5.1, 5.2 and 5.3 of this report
	○ detail any likely measures necessary to manage pedestrians and vehicles during events within the Precinct;	See *WBAP Event Traffic Management Plan*
	○ proposals for safe and efficient access to loading, deliveries and servicing of the development; and	Section 6 of this report
	○ detail sustainable travel initiatives.	Section 5 of this report

1.3 References

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

- An inspection of the site and its surrounds
- GTA Traffic Management and Accessibility Plan dated 14 January 2015
- Sydney City Centre Access Strategy
- Sustainable Sydney 2030
- Walsh Bay Arts Precinct Master Plan dated 6 August 2013
- City of Sydney 2012 LEP/DCP
- Traffic and car parking surveys undertaken by Matrix as referenced in the context of this report
- Plans for the proposed development prepared by Tonkin Zulaikha Greer (TZG) Architects, drawing numbers A.1-3, A00.000-004, A00.100-104, A02.000-004 and A07.000-007, dated 19 July 2016
- Other documents and data as referenced in this report.

2. Existing Conditions

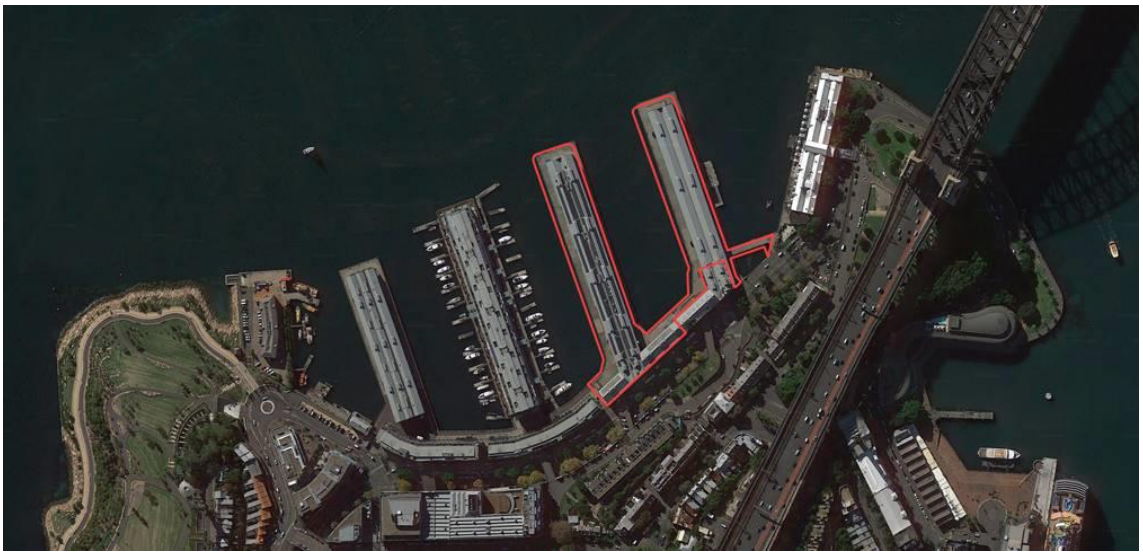
The Walsh Bay Arts Precinct (WBAP) (the "site") generally comprises Pier 2/3, Pier 4/5 and its shore sheds which make up Wharf 4/5, as well as the adjoining waterway. The site has a street frontage to Hickson Road. The site is shown in Figure 2.1 and Figure 2.2. The site is part of the Walsh Bay area which is located adjacent to Sydney Harbour within the suburb of Dawes Point. The site is located within the City of Sydney Local Government Area.

Walsh Bay is strategically located to the north of Sydney's CBD in the vicinity of major tourist destinations including the Sydney Harbour Bridge, the historic areas of Millers Point and The Rocks, Circular Quay and the Sydney Opera House. The Barangaroo redevelopment precinct is located immediately to the south-west.

Figure 2.1: Site Location

Source: Google Maps

Figure 2.2: Aerial View



Source: Nearmap

Pier 2/3 is legally described as Lot 11 in DP 1138931 and Wharf 4/5 is legally described as Lot 65 in DP 1048377. The total area for these lots is 18,090sqm.

The land owner of the site is the Roads and Maritime Services (Roads and Maritime). Both Pier 2/3 and Wharf 4/5 are occupied under various lease arrangements with Arts NSW, Department of Justice, primarily for arts and cultural uses.

The area of water that the project proposes to build over is also owned by Roads and Maritime. Its land title description is Lot 12 in DP 1138931.

Walsh Bay comprises ten berths constructed between 1908 and 1922 for international and interstate shipping. These are collectively known as the Walsh Bay Wharves. The Walsh Bay Wharves Precinct is listed as an item on the State Heritage Register.

The Walsh Bay Wharves comprise the following:

- Pier One which contains the Sebel Pier One Sydney Hotel;
- Pier 2/3 the last remaining undeveloped pier (has previously received approval for cultural uses, temporary arts events and some commercial events);
- Wharf 4/5 which is occupied by the Sydney Theatre Company (STC), the Australian Theatre for Youth Program (ATYP), Sydney Dance Company (SDC), Bangarra Dance Theatre and the choirs comprising Gondwana, the Song Company and Sydney Philharmonia;
- Pier 6/7 which has been redeveloped for residential apartments and associated boat marina;
- Pier 8/9 which has been redeveloped for office uses; and,
- Shore sheds aligning Hickson Road which contain a range of commercial activities, including restaurants, bars, shops and offices.

2.1 Road Network

2.1.1 Adjoining Roads

Hickson Road

Hickson Road is designated as a regional route (7312) and is classified to its intersection with Lower Fort Street adjacent to Pier 1.

It is understood that Hickson Road is closed between Pottinger Street and Alfred Street (adjacent to Circular Quay between 10pm and 3am on Friday and Saturday, with local access only for residents within The Rocks and Dawes Point.

In the vicinity of the site, Hickson Road functions as a dual carriageway road with three lanes in each direction. There are parking lanes either side of a single traffic lane. From boundary to boundary, there is a corridor of approximately 31 metres. A desktop assessment of Hickson Road with an indicative layout is shown in Figure 2.3.

Figure 2.3: Road cross section in vicinity of site (indicative)

Source: http://streetmix.net/-/419497, accessed 31 August 2016

There are varying parking restrictions along Hickson Road, and these have been fully recorded in a parking survey attached in Appendix D.

Hickson Road carries approximately 6,500 vehicles per day[1].

2.1.2 Surrounding Intersections

The following intersections are the major intersections in the vicinity of the precinct:

- Hickson Road and Pottinger Street (roundabout)
- Hickson Road and Lower Fort Street (unsignalised)
- Hickson Road and Towns Place (unsignallised).

2.2 Transport Volumes and Data Collection

GTA commissioned a range of traffic movement surveys on Hickson Road in the vicinity of the site on during the week beginning 22 August 2016. The following survey data was collected:

i An automatic tube count, which recorded traffic volumes for seven consecutive days adjacent to Pier 4 commencing 27 August 2016.

ii An hourly parking occupancy survey was undertaken on Hickson Road between 10am and 9pm on Saturday 27 August 2016 and Wednesday 31 August 2016 between the extents of Hickson Road where there is dual carriageway (approximately between Pier 1 and Pier 9). Results of the parking occupancy survey are presented Section 2.4.

iii The usage of the two vehicular accesses to the Wharf 4/5 loading dock (on Hickson Road and the overpass bridge from Pottinger Street) was counted from 7am to 10am on Wednesday 31 August 2016.

iv Pedestrian and cycle access to the Wharf 4/5 site was monitored on Wednesday 31August 2016 between 7am and 1pm, as well as Saturday 27 August 2016 between 6pm and 10pm.

1 Based on 24-hour surveys undertake for the week of 27 August to 2 September 2016.

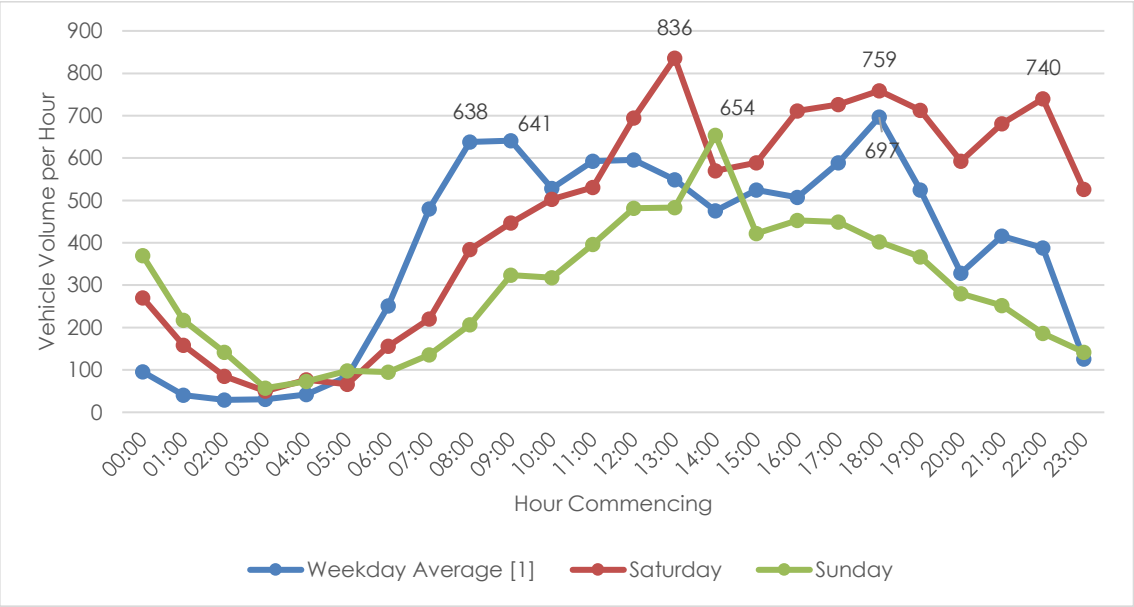
It is noted that items iii and iv are specific to the Sydney Theatre Company tenancy, but given the site makes up part of the broader precinct, it is considered appropriate to report on the traffic generation. Traffic generation rates for the Sydney Theatre Company may provide indicative site generation to other comparable tenancies within the Walsh Bay Arts Precinct.

2.2.1 Traffic Volumes

The results of the seven-day automatic tube count survey are summarised in Figure 2.4, with full results contained in Appendix A.

Figure 2.4 presents two-way vehicle movement data on Hickson Road, adjacent to Wharf 4/5. The result indicates a road peak period of 8am to 10am and 6pm to 7pm on weekdays and 1pm to 3pm on a weekend. Peak vehicle volumes were observed on the Saturday with a peak of 836 vehicle movements per hour along Hickson Road at 1pm.

Figure 2.4: Existing traffic volumes by hour

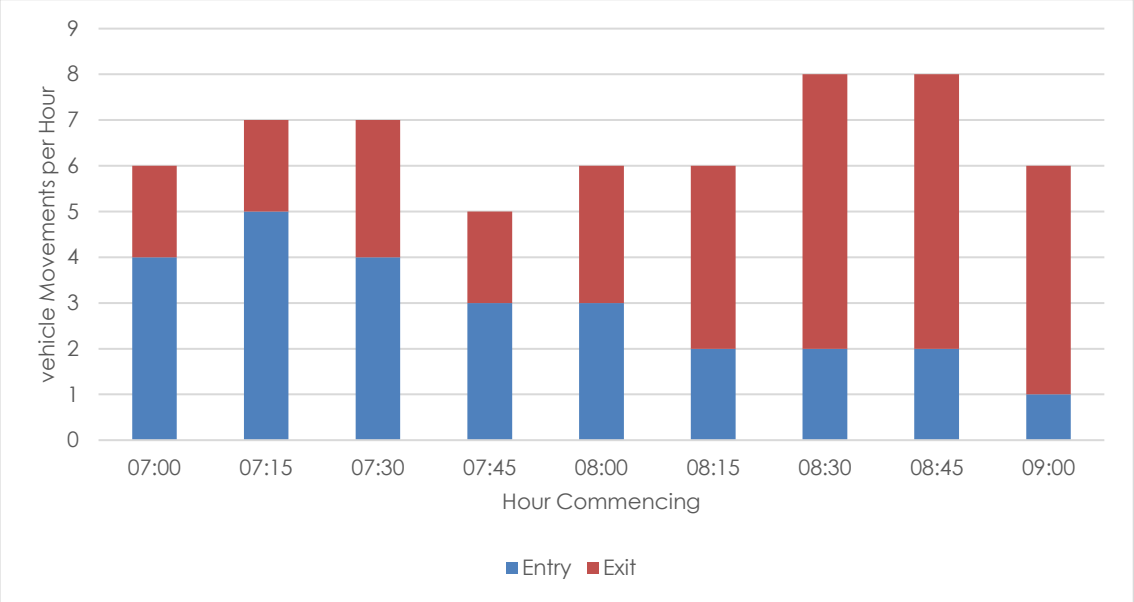


[1] The weekday average includes only days Monday to Wednesday due to data errors present on the Thursday and Friday.

2.2.2 Vehicular Access to Wharf 4/5 Loading Area

The results of the vehicle entry and exit counts into the Wharf 4/5 loading areas from Hickson and the Pottinger Street overpass re summarised in Figure 2.5, with full results provided in Appendix B.

Figure 2.5: Wharf 4/5 loading dock entry/ exit movements



2.2.3 Pedestrian and Cyclist Volumes

As noted, pedestrian and cyclist movements were recorded on Saturday 27 August between 6pm and 10pm and Wednesday 31 August between 7am and 1pm.

During the four-hour period on Saturday, a total of 1,137 pedestrian movements were recorded into and out of Wharf 4/5. Two peak periods were recorded during the survey period including a significant peak in the hour commencing at 7pm (442 total movements) and a smaller peak in the hour from 9pm (296 total movements). This coincides with the peak performance times for the Sydney Theatre Company, who ae one of the key tenants.

During the six-hour period on Wednesday, a total of 763 pedestrian movements were recorded in and out of Wharf 4/5. Peak pedestrian movement is recorded to occur at 10:15am to 11:15am, with 278 pedestrian movements per hour.

The survey results indicate that the peak usage is on a Saturday evening.

A summary diagram of pedestrian movements is shown in Figure 2.6 and Figure 2.8, with full results contained in Appendix C.

A total of five cyclist movements were recorded on the Wednesday, distributed over the six-hour survey period. No cyclist movements into or out of the Sydney Theatre Company site was recorded on the Saturday.

Figure 2.6: Saturday rolling hourly pedestrian observations

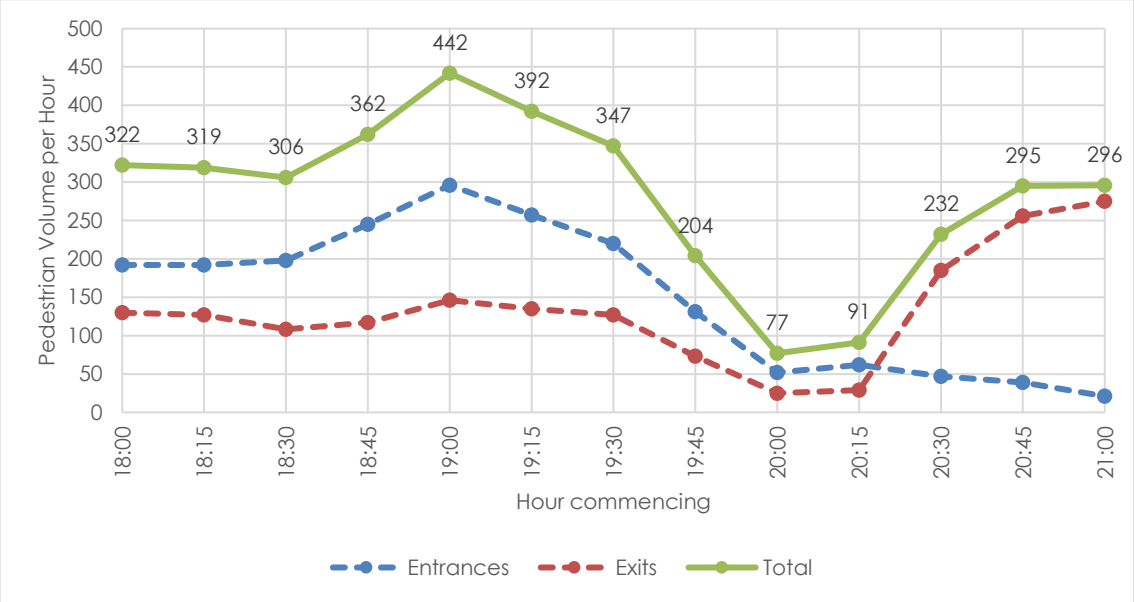
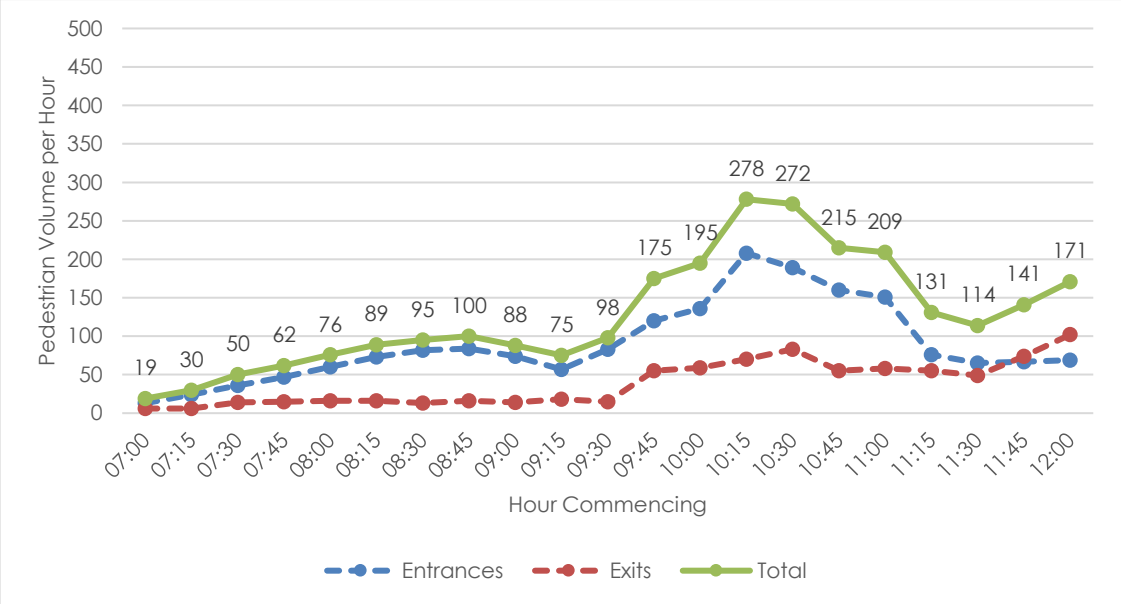


Figure 2.7: Wednesday rolling hourly pedestrian observations



2.3 Transport Studies

The Sydney City Centre Access Strategy developed by Transport for NSW outlines transport principles for the CBD area over the coming years, including the redesign of transport networks which commenced after the commencement of the light rail construction in October 2015.

2.4 Car Parking

2.4.1 Supply

GTA commissioned parking demand surveys (and subsequently obtained overall supply numbers) which compiled an inventory of publicly available on-street and off-street car parking within approximately 250 metres east and west of the subject site.

Where surveys were undertaken, Hickson Road is somewhat atypical with its street configuration, with three lanes in each direction, with a parking lane either side of a traffic lane. This substantially increases the parking availability compared to more typical road layouts.

The inventory identified a total of 227 on-street spaces (233 on Wednesday) distributed as follows:

- Northbound lane kerbside – 52 spaces
- Southbound lane kerbside – 30 spaces
- Northbound lane median – 75 spaces
- Southbound land median – 70 spaces (76 on Wednesday).

A parking study was commissioned along Hickson Road between 10am and 9pm on Saturday 27 August 2016 and between 10am and 9pm on Wednesday 31 August 2016. A total of 227 on-street spaces was counted between Towns Place and Pier 1 where there is parking in the median and on the outside kerb.

Immediately adjacent to the site, there is primarily the presence of service vehicle parking, with extensive loading zones and taxi zones. Opposite the site (noting the presence of the 'inside' parking lanes, parking generally varies between two and four-hour paid parking).

The full inventory is presented in Appendix D of this report.

2.4.2 Demand

Parking demand surveys were commissioned by GTA within the nominated area during the following periods:

- An hourly parking occupancy survey was undertaken on Hickson Road Saturday 27 August 2016 and between 10am and 9pm on Wednesday 31 August 2016 along the extent of Hickson Road where there is dual carriageway (approximately between Pier 1 and Pier 9).

The results of the parking occupancy survey are summarised in Figure 2.8 and Figure 2.9, with full results provided in Appendix D.

As a general comment, parking occupancy gradually rose throughout the day to a peak of 79 per cent and 60 per cent in the Saturday and Wednesday mid-afternoon respectively before declining. There was a large influx of demand in the evening (8pm) of near 90 per cent on the Saturday and up to 76 per cent on the Wednesday.

The peak in the evening parking survey corresponds with the evening peak of pedestrian movements, which coincides with the peak periods for the Sydney Theatre Company's performances.

Figure 2.8: Hourly parking demand

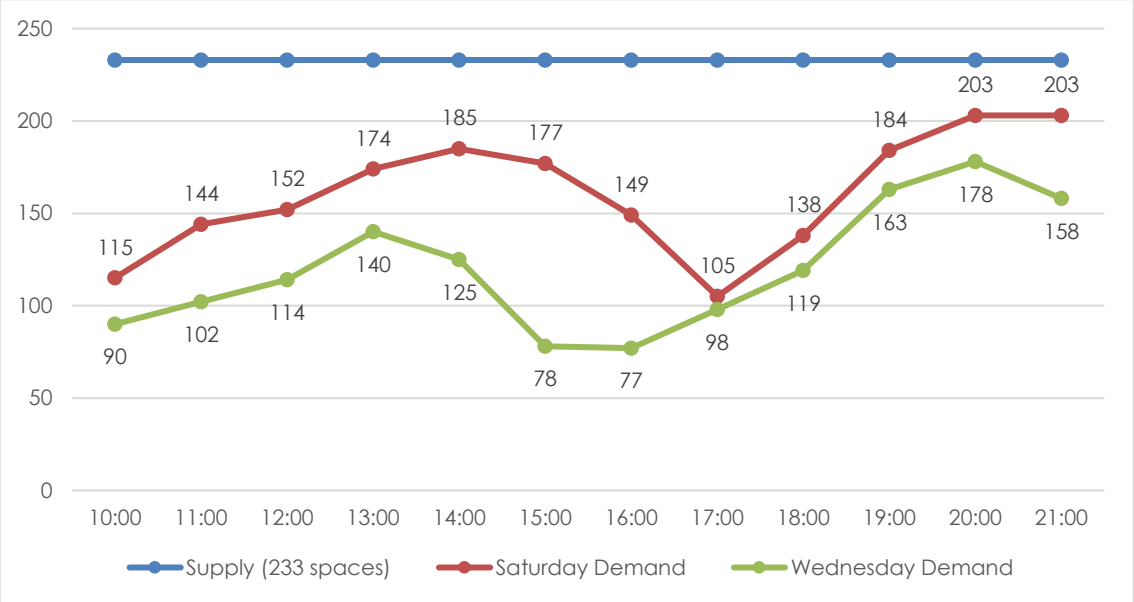
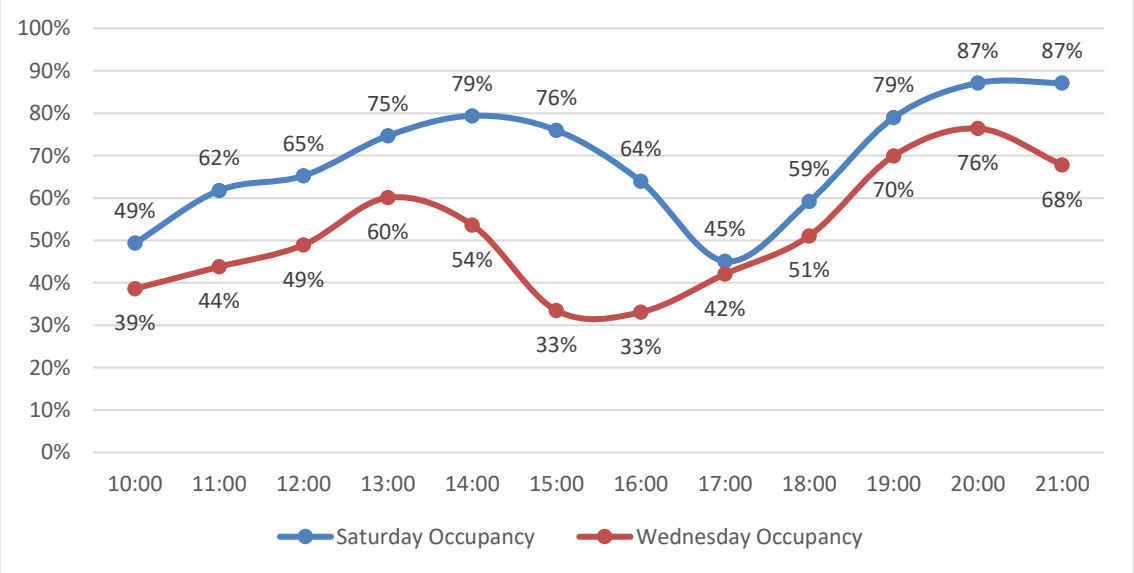


Figure 2.9: Hourly parking occupancy



2.4.3 Commercial Car Parks

Currently three existing commercial car parks exist in the vicinity of the site, including:

- Barangaroo Point car park, accessed from Hickson Road south of Pier 8
- Barangaroo Reserve car park, located under the Headland Park at Towns Place,
- Bond Store One car park, adjacent to the Roslyn Packer Theatre.

All three car parks are located along Hickson Road within 200 metres of the Walsh Bay Arts Precinct.

Most notably, the Bond Store One building is located across the road from Wharf 4/5, which contains 175 car parking spaces and provides 10 per cent discount to Sydney Theatre Company patrons on weekdays after 5pm and on weekends.

A parking occupancy spot check was undertaken by GTA on Saturday 22 October 2016 between 8pm and 8:30pm, of the above car parks. The results of the occupancy survey are detailed in Table 2.1.

Table 2.1: Commercial car park occupancy (Saturday 8 to 8:30pm)

Car park	Supply	Spaces occupied	Occupancy
Barangaroo Point car park	217	43	20%
Barangaroo Reserve car park	300	41	14%
Bond Store One car park	175	165	94%
Total	**692**	**249**	**36%**

As indicated in Table 2.1, the overall demand for parking in the surrounding area is low relative to supply, on a typical Saturday evening.

Notably, the Bond Store One car park had a high parking demand of 94 per cent of parking spaces occupied. This demand was generated by the adjacent Roslyn Packer Theatre where an event was being held at the time of the survey. The results record a typical Saturday evening as events at the Roslyn Packer Theatre is a regular occurrence.

2.5 Public Transport

A review of the public transport available in the vicinity of the site is summarised in Table 2.2. Public transport to the site was altered as a consequence of the rerouting of buses in the Sydney CBD following the commencement of the construction of the CBD light rail in October 2015. The following is a summary of existing public transport, noting that substantial changes will occur in the coming years.

Table 2.2: Public transport provision

Service	Route number	Route description	Location of stop	Distance to nearest stop	Frequency on/off peak
Bus	324, 325	Watsons Bay to Walsh Bay (different routes)	Hickson Rd opposite Wharf Theatres (2000130)	20 m	10-15 mins/ 15-30 mins
Bus	311	Railway Square to Millers Point via Woolloomooloo	Barangaroo Reserve, Hickson Road (2000439)	250 m	15 mins / 30-45 mins
Train	T1 (Wynyard Only), T2, T3	Services to Hornsby, Richmond and Penrith (Wynyard Only), as well as Liverpool, Lidcombe via Bankstown, and Campbelltown via Clyde or East Hills	Circular Quay/ Wynyard	1.5 km	2 mins (combined)/ 10 mins (combined)
Ferry	All	All	Circular Quay	1.5 km	

The nearest bus stop to the site providing services to all bus routes passing the site is the Hickson Road opposite Barangaroo Reserve (#2000439) stop. Figure 2.10 and Figure 2.11 illustrates the extent of regional access from the subject bus stop (without interchanges).

Figure 2.10: Sydney Buses region guide

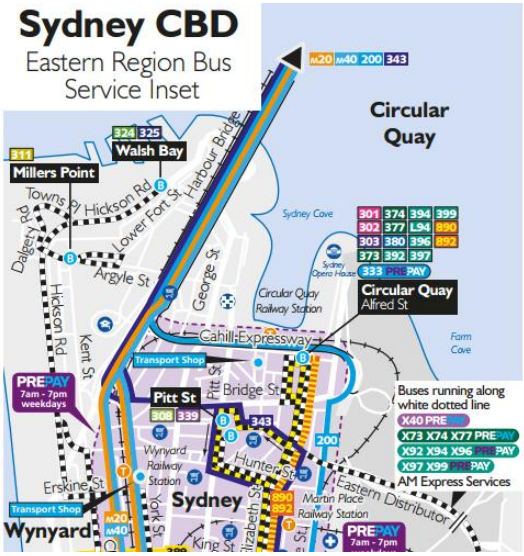


Figure 2.11: Bus access from stop #2000439 near site

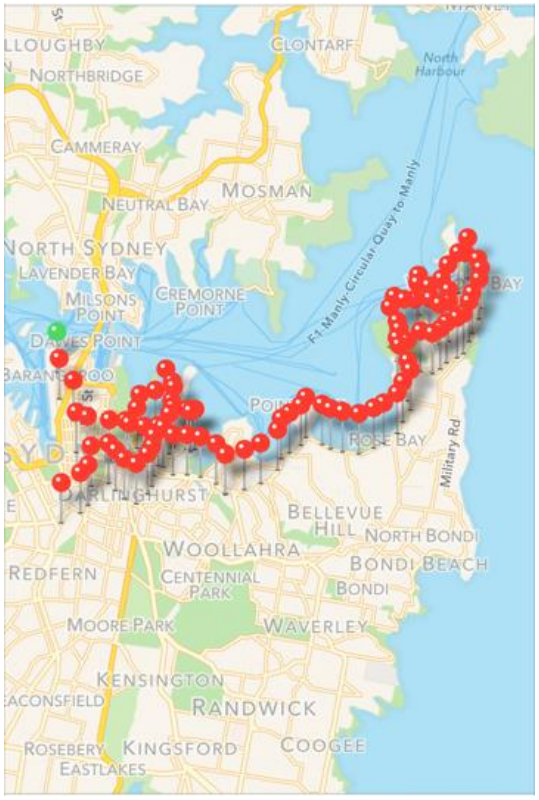


Figure 2.10 source: http://www.sydneybuses.info/routes/15326_STA_region_web_map_east_20160801.pdf, accessed 22 August 2016
Figure 2.11 source: iOS Tripview app, accessed 22 August 2016

2.6 Pedestrian and Cycling Infrastructure

As a result of the isolated nature of the site from the CBD and significant grade changes, topographically, the Walsh Bay Arts Precinct is currently somewhat difficult to navigate and access by foot. Improved wayfinding and repeater signage from key nodes surrounding the site is essential for encouraging pedestrian access to the Walsh Bay Arts Precinct. It is envisaged that the majority of walking trips to the site will be from the CBD and the Wynyard and Circular Quay transport hubs. In this regard, the primary pedestrian links to and from the site will be via George Street towards the core of the CBD and Circular Quay and Hickson Road towards Barangaroo and Wynyard Walk (providing access to the railway station). An alternative route is also available via Observatory Hill.

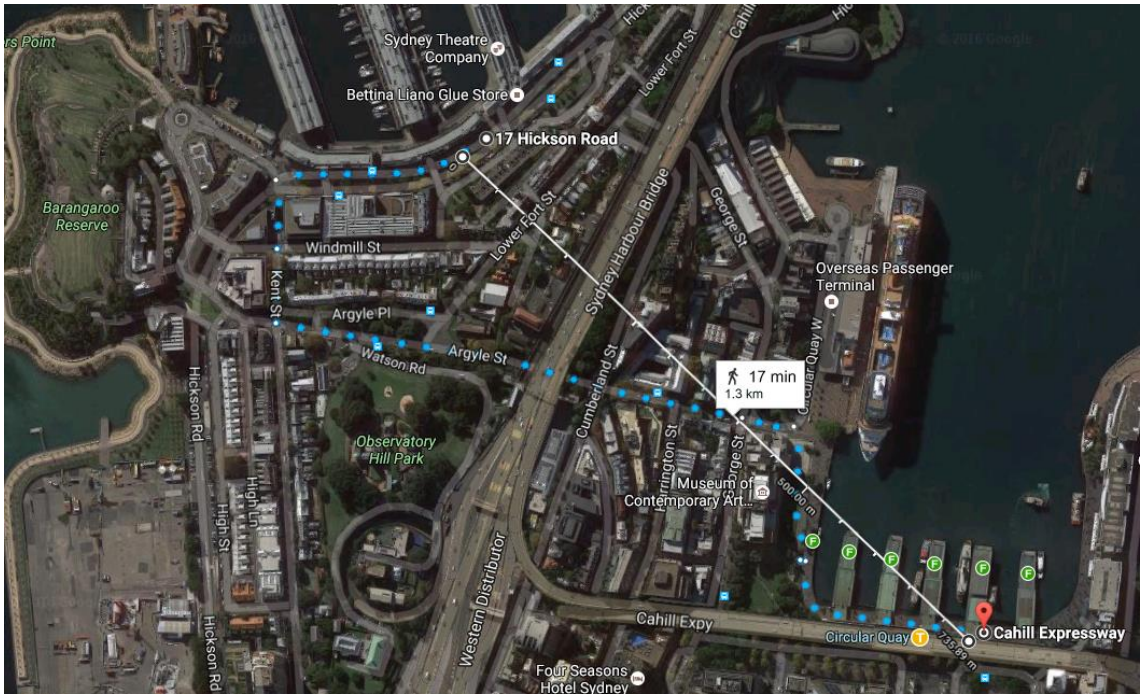
George Street between Lower Fort Street and Circular Quay forms a pedestrian friendly environment, with low vehicle speeds and relatively generous footpath widths. The pedestrian route from the end of George Street to the site itself is somewhat circuitous and includes a number of sets of stairs (i.e. non-Disability Discrimination Act [DDA] compliant) as the path negotiates the significant grade difference between Hickson Road and the areas further inland.

It is also noted that the Barangaroo Integration Works are currently being undertaken by the Barangaroo Delivery Authority to improve east-west connections to the west of the site, including Argyle Street, Dalgety Road and Towns Place. These works will improve pedestrian connectivity between the CBD/ Millers Point and the Walsh Bay and Barangaroo waterfront areas.

The current pedestrian route south along Hickson Road towards Wynyard station is not an ideal pedestrian environment; however, the north-south section of Hickson Road will be upgraded to form a more pedestrian friendly environment as part of the works associated with the Barangaroo development.

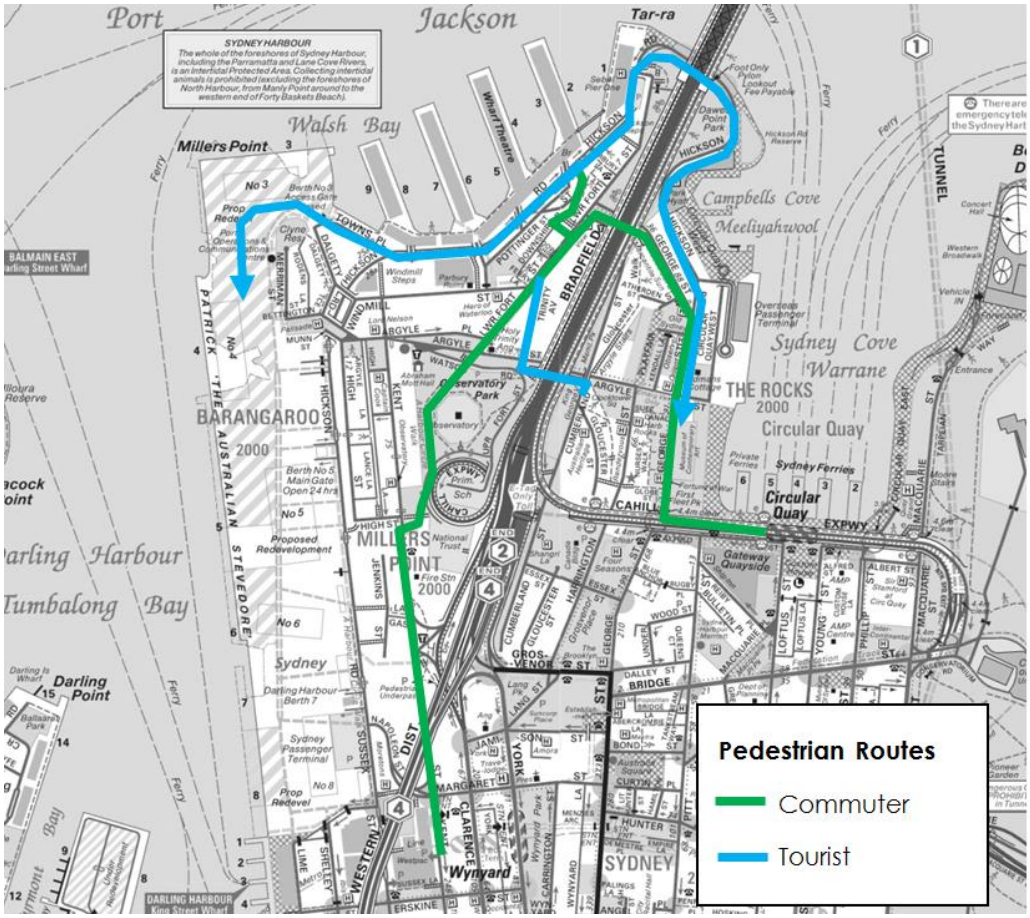
As a general overarching comment, pedestrian paths are provided on all streets surrounding the site. There remain some challenges in providing direct links to various points of interest. For example, as the crow flies, Wharf 4/5 is 700 metres from Circular Quay. However, when a walking network distance is considered, it increases to approximately 1.3 kilometres, which is indicative of a substantial distance penalty (Figure 2.12).

Figure 2.12: Pedestrian detour



Source: Google Maps, accessed 22 August 2016

Figure 2.13: Key pedestrian routes to and from Walsh Bay

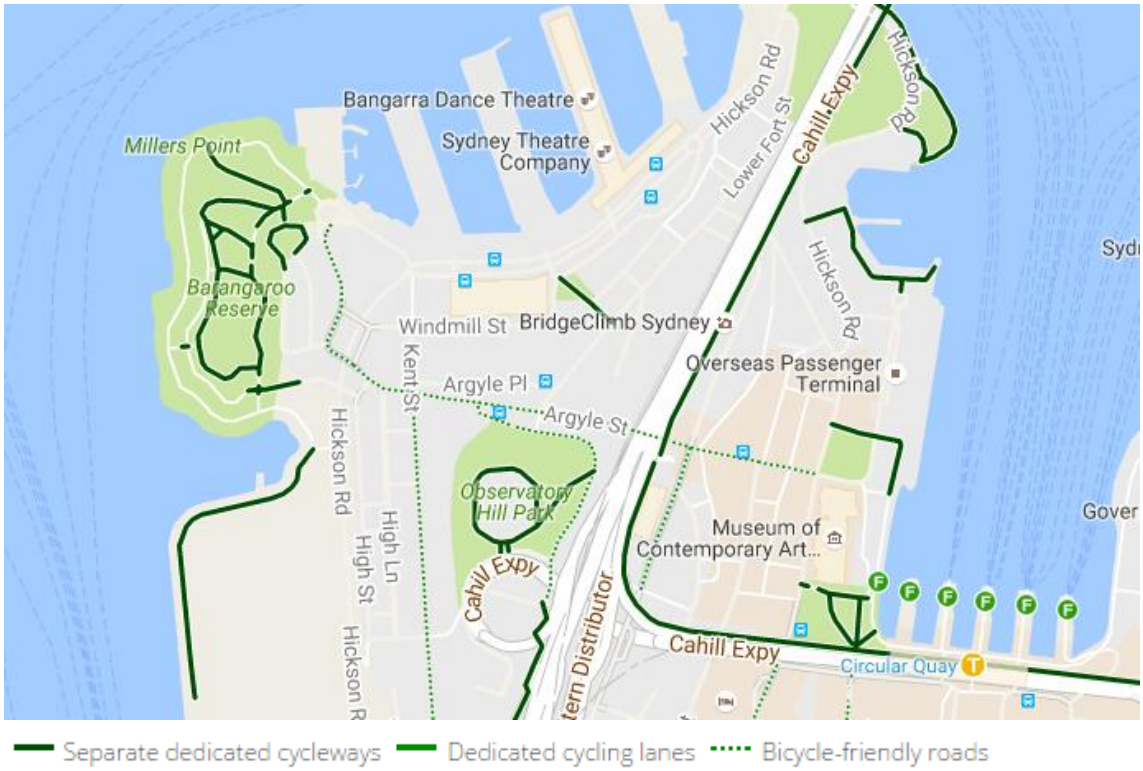


Notwithstanding the directness of pedestrian infrastructure, the Dawes Point region (the northern area bound between Walsh Bay Arts Precinct and the Cahill Expressway) has a number of zebra crossings to facilitate the safe movement of pedestrians across the road corridor. Such safe crossing points in vicinity of the site include the following pedestrian crossings:

- zebra crossing across Hickson Road adjacent to Pier 7
- an unmarked crossing point immediately adjacent to the site
- zebra crossings across Hickson Road and Pottinger Street at the roundabout to the east of the site.

Limited cycling infrastructure is available immediately adjacent to the site, noting that the Sydney Cycleways map does not indicate the presence of shoulder lanes on Hickson Road.

Figure 2.14: Sydney Cycleway map (not fully inclusive)



Source: http://www.sydneycycleways.net/map/, accessed 22 August 2016

A walk score is provided by walkscore.com (https://www.walkscore.com/). Whilst there is no official recognition of the walk score and transit score by any transportation authority, the score gives insight into how accessible an area is for people travelling without a car. The score lies on a scale between 0 and 100. The site gives the following description on what each score means:

Table 2.3: Walk score

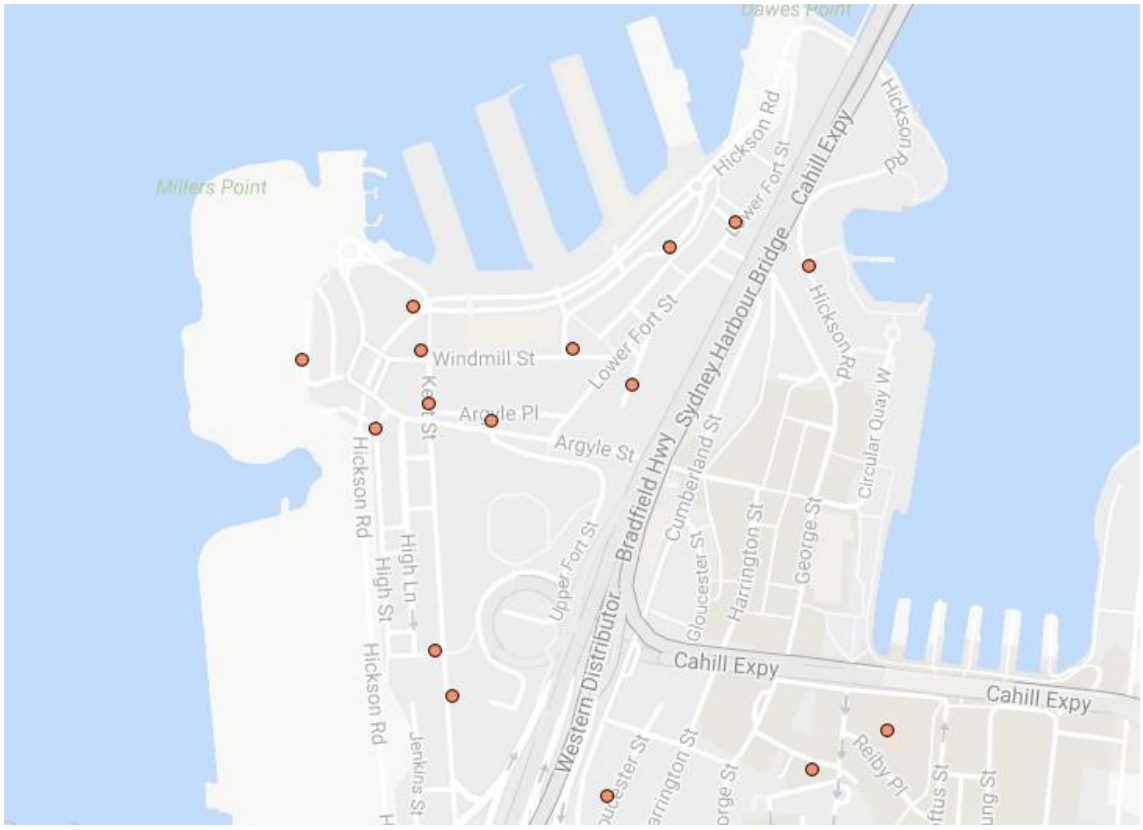
Score	Walk score meaning
90 – 100	**Walker's Paradise** Daily errands do not require a car
70 – 89	**Very Walkable** Most errands can be accomplished on foot
50 – 69	**Somewhat Walkable** Some errands can be accomplished on foot
25 – 49	**Car-Dependent** Most errands require a car
0 – 24	**Car-Dependent** Almost all errands require a car

Dawes Point has a designated walk score of 92 and is ranked the 26th most walkable community in Sydney, and for comparative purposes, is ranked alongside suburbs such as Glebe, North Sydney and Milsons Point. Such a score is indicative that the site is well suited for residents and employees to carry out tasks either by walking or via public transportation, and is consistent with an environment which car use can be largely avoided. No bike score or transit score is provided for Dawes Point.

2.7 Local Car Sharing Initiatives

Car share initiatives such as GoGet aim to promote a reduction in private vehicle ownership. GoGet maintains a number of pods within Dawes Point. A map showing vehicle locations is shown below in Figure 2.15. It shows the presence of 16 pods within approximately one kilometre of the site, with 11 of these located north of Argyle Place.

Figure 2.15: Car share pods



Source: http://www.cityofsydney.nsw.gov.au/live/residents/car-sharing, accessed 22 August 2016

2.7.1 Existing Transport Use

The 2011 Census Journey to Work (JTW) data generally provides the most robust picture of existing travel patterns to and from the development and Greater Sydney. The smallest geographical area for which JTW data is available is known as a travel zone (TZ).

The Walsh Bay Arts Precinct occupies the travel zones 6, 7, 8, 9 and 10 as shown in Figure 2.16. JTW data for this travel zone from the 2011 census was to be reviewed to understand the current mode of travel to work for people living within the zone and determine changes in travel patterns over the two periods. The result of the data is shown in Table 2.4.

Figure 2.16: TZ boundary

Source: http://visual.bts.nsw.gov.au/jtwbasic/#9,6,7,8,10, accessed 23 August 2016

Table 2.4: Census JTW data

Travel mode	2011 Census – TZ6, TZ7, TZ8 TZ9 and TZ10 (n=443 residents)	2011 Census – TZ6, TZ7, TZ8 TZ9 and TZ10 (n=2,089 workers)
Vehicle Driver	38%	30%
Walked Only	32%	5%
Bus	10%	19%
Train	8%	30%
Other Mode (Incl. Cycling)	7%	6%
Vehicle Passenger	3%	3%
Ferry/Tram	1%	5%
Not Stated	1%	1%

Source: http://visual.bts.nsw.gov.au/jtwbasic/#9,6,7,8,10, accessed 23 August 2016

Table 2.4 shows that for residents of the area, there is generally a higher reliance on private vehicles than for employees of the area. For residents, there is a significantly higher proportion of people who walk to work, and for workers, there is a significantly higher proportion of people who catch the train to the area.

Employment Patterns

In TZs 6, 7, 8, 9 and 10 as reported above, of the 443 people who lived within the area and commuted to work, 293 (66%) work in the Sydney Inner City SA3. Other areas of employment are relatively small in proportional and absolute terms.

For workers within the area of the Walsh Bay Arts Precinct, in the 2011 census, there were 2,089 workers and these workers can be assessed by access mode and from the SA3 they commuted from. The assessment is shown below in Table 2.5 and includes SA3s with at least 80 origin trips.

Table 2.5: Commute patterns for employees of TZ6, 7, 8, 9 and 10

Origin SA3 (number of trips)	Vehicle driver	Bus	Train	Vehicle passenger	Walk only	Other	Ferry	Not stated
Sydney Inner City (421)	19%	18%	23%	5%	23%	11%	N/A	1%
Eastern Suburbs – North (230)	35%	21%	22%	1%	N/A	8%	11%	1%
North Sydney – Mosman (143)	24%	37%	5%	2%	9%	4%	14%	4%
Eastern Suburbs – South (107)	32%	54%	4%	N/A	N/A	10%	N/A	N/A
Strathfield – Burwood – Ashfield (97)	26%	N/A	67%	3%	N/A	4%	N/A	N/A
Leichhardt (85)	32%	43%	N/A	4%	N/A	14%	8%	N/A
Overall (2,089)	30%	19%	30%	3%	5%	6%	5%	1%

Source: http://visual.bts.nsw.gov.au/jtwbasic/#9,6,7,8,10, accessed 23 August 2016

The following comments can be made about Table 2.5:

v There are 80 people who work at the area of the Walsh Bay Arts Precinct, live within the Sydney Inner City SA3 and elect to drive to work at the precinct. In contrast, 97 people walk.

vi Given the proximity to Circular Quay, a five per cent overall mode share for the ferry is not unexpected, representing approximately 100 people.

vii 67 per cent of people who live in the Strathfield – Burwood – Ashfield SA3 elect to commute to work at the precinct by train.

viii An 'other' mode of six per cent is consistent with the cycling links provided on Kent Street and the Sydney Harbour Bridge which provides largely separated cycling access to areas such as Leichhardt and North Sydney.

ix Overall, vehicle driver proportion may be higher than expected, but is significantly lower than the overall rate for Sydney. Train, bus and ferry services support a high public transport access rate to the precinct and a significant proportion of people elect to transport to work by 'other' mode (cycling).

x Where there are visitors to the site, an assumption is made that the visitors will adopt comparable mode splits as the employees of the site.

3. Development Proposal

3.1 Proposal

The approved Stage 1 development application comprised:

- A new waterfront public square between Pier 2/3 and Wharf 4/5;
- A series of new stairs and balconies on Pier 2/3 and Wharf 4/5 and modification to the roof of Pier 2/3;
- The inclusion of new tenancy spaces in Pier 2/3 and Wharf 4/5 for arts and cultural activities; and,
- The use of the precinct for arts festivals, events and pop-ups and associated uses, including restaurants, cafes and bars.

The WBAP Stage 2 State Significant Development Application seeks consent for construction works for the above to realise the WBAP project, as well as the proposed external alterations and additions to all of Wharf 4/5. It also seeks consent for new commercial and event uses in the precinct. Key aspects of the proposed development are outlined below:

Early works

- Early construction works comprising infrastructure upgrades, demolition, hazmat removal and sub structure works.

Pier 2/3

- Internal alterations and reconfiguration to provide for the following:
  - Performance venues;
  - Rehearsal rooms, production workshops, back of house facilities and offices;
  - Function spaces, bars, cafes and foyer spaces extending onto external gantry platforms (balconies) providing breakout space for internal foyers and allowing views of outdoor performances;
  - Mezzanine spaces for offices and back of house facilities;
  - Upgrades to meet compliance with current BCA, DDA and fire codes;
  - New lifts and stairs;
  - Creation of new commercial tenancies and public toilets;
  - Removal of some storey posts and beams to facilitate internal reconfiguration and new uses; and
  - Retention of a large proportion of the ground floor in its existing 'raw' heritage state for events and festivals including Sydney Writers' Festival and Biennale including venue and commercial hire.
- External alterations and additions comprising:
  - New balconies and external stairs for fire egress;
  - New external lift for access;
  - Installation of glazing in existing cargo sliding door openings and other solid panels on the eastern, western and northern elevations to allow for views into and out of the building;
  - Roof penetrations within the central valley at the southern and northern end to accommodate new performance spaces and associated structural modifications including truss strengthening;

- Installation of ESD elements, such as photovoltaic panels and seawater heat exchange systems; and
- Raising of the external floor level on the eastern side by introducing a new raised deck and continuous set of stairs beyond the existing column line.

Wharf 4/5

- Internal alterations and reconfiguration to the Bangarra Dance Theatre (BDT) tenancy to provide for the following:
  - Upgrade of the main rehearsal and performance spaces;
  - Upgraded foyer and exhibition space along the eastern frontage;
  - Improved office space at mezzanine level including a new lift and stairs;
  - Provision of a function space at ground level of the northern end of wharf with associated kitchen facilities; and
  - New entrance and new glazing in bays of sliding cargo doors, opening up the foyer and main studio to the Pier 4 apron.
- Minor internal alterations and additions to the SDC tenancy comprising:
  - Reducing the existing workshop space to create a fifth dance studio; and
  - Upgrading office and reception areas.
- External alterations and additions to SDC tenancy comprising:
  - Raising of the timber wharf deck adjoining the SDC café and opening of the facade with new glazing to activate the waterfront square.
- Creation of new commercial tenancies and public toilets;
- External fabric alterations around the Sydney Theatre Company (STC) tenancy comprising:
  - Improved street entry at Hickson Road involving relocation of the stairs to allow for an improved landing and point of arrival to the STC;
  - New 'gantry' balconies, stairs and lifts mid-wharf and at the end of the wharf to provide for improved accessibility and compliance with fire engineering solutions;
  - Minor amendments to the existing façade to accommodate new entries and exits along the wharf;
  - Roof penetrations within the central valley at two locations to accommodate theatre and workshop spaces and associated structural modifications including truss strengthening; and
  - Reinstallation of existing photovoltaic panels where applicable.

Wharf 4/5 Shore Sheds

- Internal alterations to reconfigure the choir spaces, including provision of a mezzanine for choir administration;
- Creation of new commercial tenancies at ground and mezzanine levels; and
- Provision of office space at ground level.

Public Domain

- Construction of a new waterfront square comprising a deck on piled structure:
- Shaded informal performance space on piled structure; and
- Changes to existing levels and steps down to facilitate access between the existing apron and new waterfront square.

New Uses

- Use of the precinct for arts festivals, events and pop ups as well as a range of activating uses such as retail, restaurants, cafes and bars.

3.2 Population and Patronage

The overall development is expected to cover an area of approximately 16,500 square metres, and the precinct is expected to support a workforce of approximately 940 staff and up to 2,100 visitors on a typical day (Bates Smart, February 2014), from the following site uses:

- Pier 2/3 – 370 staff
- Pier 4/5 – 570 staff
- Public Domain – 1,600 visitors
- Waterfront Square – 500 visitors.

3.3 Loading Areas

A new loading facility is to be provided on Pier 2/3. To maintain the heritage values of the site, the provision of a traditional recessed loading dock was not considered appropriate. As such, the provision of a loading dock contained within the existing apron was identified as the preferred loading solution.

The existing loading facility on Wharf 4/5 will continue to operate as per its existing arrangement.

The suitability of the proposed loading arrangements is discussed in Section 6 of this report.

4. Car Parking

4.1 Car Parking Requirements

The car parking provision requirements for different development types are set out within the City of Sydney's 2012 Local Environment Plan (LEP), noting that the site does not strictly fall within the City of Sydney's planning control. A review of the car parking requirement rates and the floor area schedule results in a statutory parking requirement for the proposed development is summarised in Table 4.1.

Table 4.1: Statutory car parking requirements

Description	Use	Size	Statutory parking rate	Statutory parking requirement
Entertainment	Commercial uses and function centres	16,500 m²	1 space/30 m²	550 spaces (max)
Total				**550 spaces (max)**

Based on the above, the proposed development could provide a maximum of 550 car parking spaces, noting that this calculation does not acknowledge the administrative functions and other ancillary uses expected within the tenancies.

4.2 Adequacy of Parking Supply

Despite falling outside of the City of Sydney's planning control, the rates from the City of Sydney's LEP has been considered as part of this development proposal. The LEP outlines parking provision at a maximum of one space per 30 square metres for 'entertainment' purposes.

As the parking provision is a maximum, no parking is proposed and this is consistent with the City of Sydney's and Transport for NSW objectives for the area in promoting sustainable transport options.

Notwithstanding zero supply of car parking, it is expected that the site will still have some private vehicle traffic demand. In the previously commissioned Traffic Management and Accessibility[2] report, GTA estimated that such demand might be expected to be 84 spaces on a typical weekday and 68 spaces on a typical Saturday.

With consideration of the surrounding existing on-street and off-street supply (approximately 690 spaces), the supply is modest and able to be accommodated.

In the short term after the development, if there is a parking supply shortfall, then drivers will notice that parking is in short supply and in the medium-to-long term, this will likely support mode shift to other transport modes.

It might be considered appropriate that some provision of disabled parking is provided on Hickson Road to support precinct access for less mobile individuals.

[2] GTA Consultants, *Traffic Management and Accessibility Report,* 23 June 2014

4.3 Vehicle Access

Vehicle access to the precinct at Hickson Road level would be altered such that service vehicles access via the perimeter only during typical operation (see Figure 4.1), with up to 8.8m Medium Rigid Vehicles able to access Pier 2 and 6.4m vehicles able to access Wharf 5. Vehicle size restrictions are largely determined by the available manoeuvring area at the northern end for vehicles to be able to enter/ exit in a forward direction. Event mode operation would allow vehicles to enter Pier 3 and Wharf 4 for bump-in/ bump-out activities (see Figure 4.2).

Figure 4.1: Service vehicle access summary – typical operation

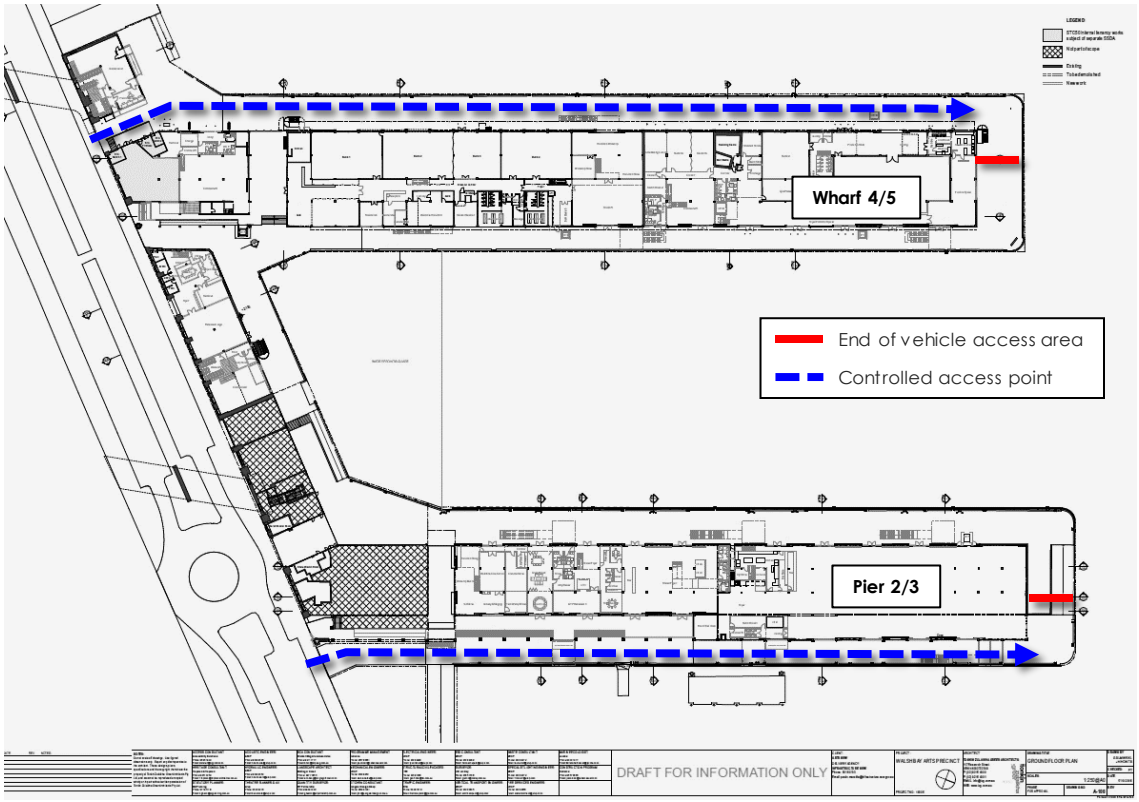
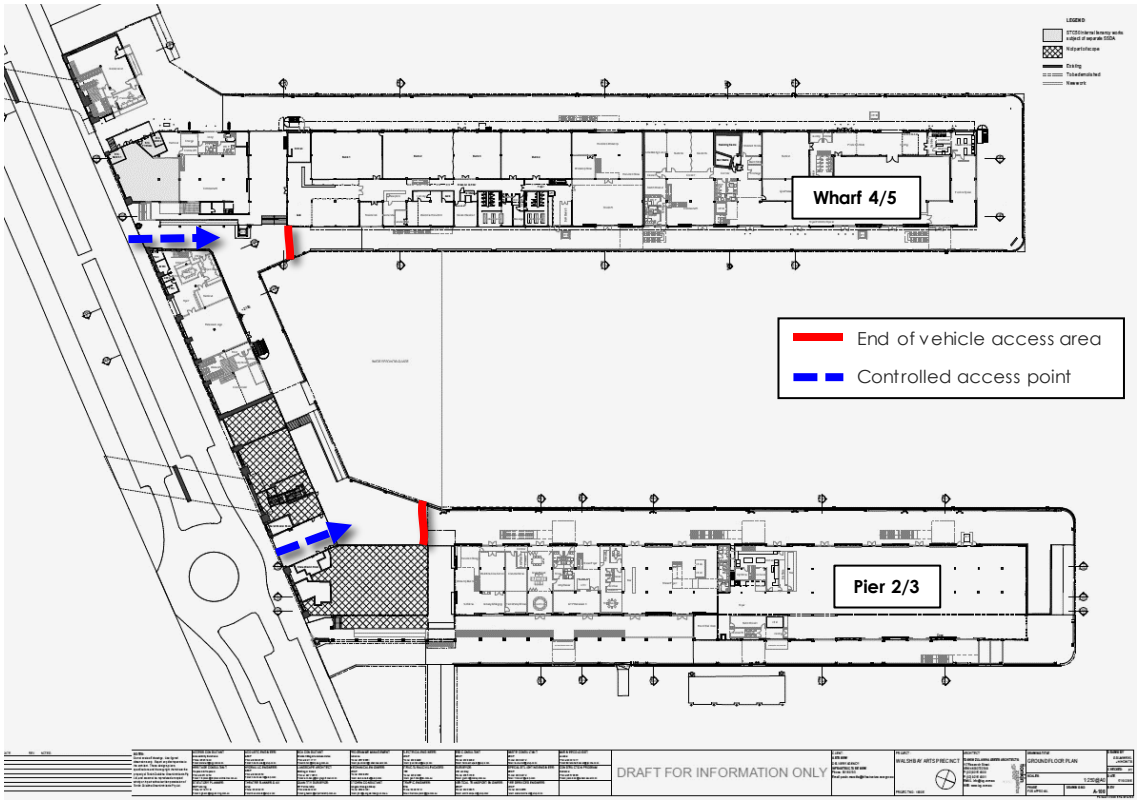


Figure 4.2: Service vehicle access summary – event mode



5. Sustainable Transport Infrastructure

The Barangaroo Integrated Transport Plan outlines that it will target 85 per cent mode share by public transport, 10 per cent access by walking and cycling (excluding access/egress linked trips) and five per cent by private vehicle.

5.1 Bicycle End of Trip Facilities

Various NSW bicycle planning guidelines typically outline that bicycle parking provision should be approximately three to five per cent of capacity and/or staff numbers. Accordingly, with a workforce of 940 staff and up to 2,100 visitors, it might be expected that up to 152 spaces might be typically provided. Whilst this remains indicative, the anticipated clientele of the precinct (with consideration of time and function type) would not be typically expected to access the precinct by bicycle.

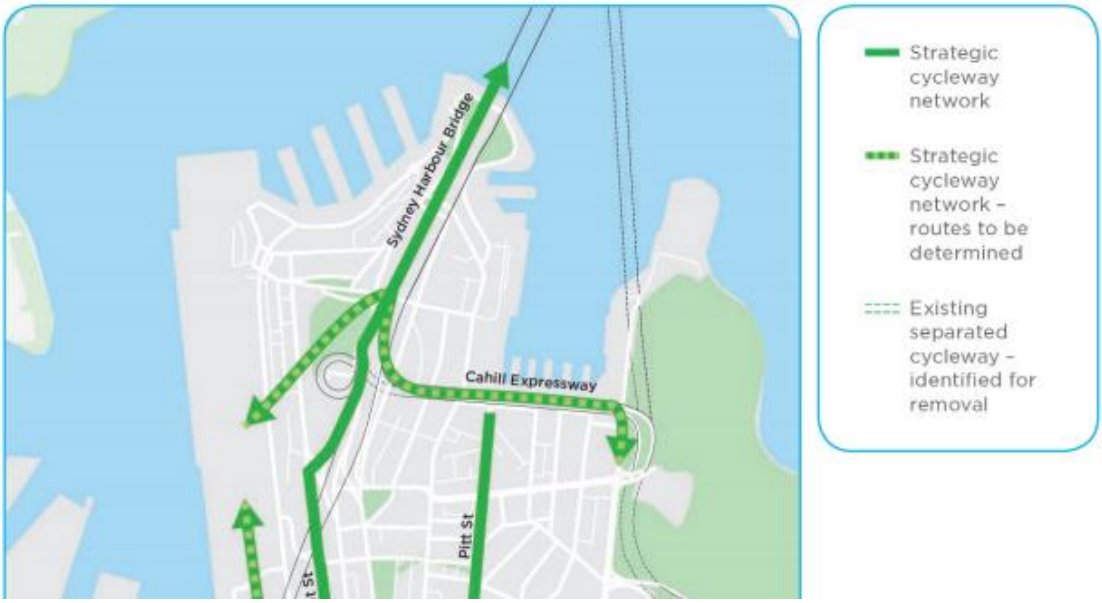
Accordingly, GTA has developed a bicycle parking provision of approximately three per cent and advises that 28 secure bicycle parking spaces be provided on-site for staff, ideally with shower and locker facilities and 62 visitor bicycle spaces be provided at suitable locations within the WBAP public domain. Future opportunities to be investigated within the precinct should demand arise (noting the high variability in visitor activity within the precinct).

The concept plan of the WBAP has accordingly provided 25 secure bicycle parking facilities on site for staff and visitor bicycle parking racks within the public domain (with capacity for approximately 80 bicycles). The provision of visitor bicycle parking is notably higher than the estimated parking requirement of three per cent. It is anticipated that any minor shortfall in staff bicycle parking provision would be accommodated within the visitor parking spaces situated around the WBAP site.

5.2 Walking and Cycling Network

Whilst the Walsh Bay area is not expected to be subject to further cycleway development, it remains in close proximity to key cycling corridors including the Sydney Harbour Bridge cycleway, and is therefore relatively easy to access from the Kent Street cycleway and areas such as Pyrmont Bridge. Separated cycling infrastructure is probably not required due to the lower volumes of traffic on the peninsular. However, as part of the Sydney City Centre Access Strategy, a cycleway might look to be developed to integrate with Barangaroo, which would then provide enhanced access to the Walsh Bay Arts Precinct.

Figure 5.1: Strategic cycle network



5.3 Public Transport

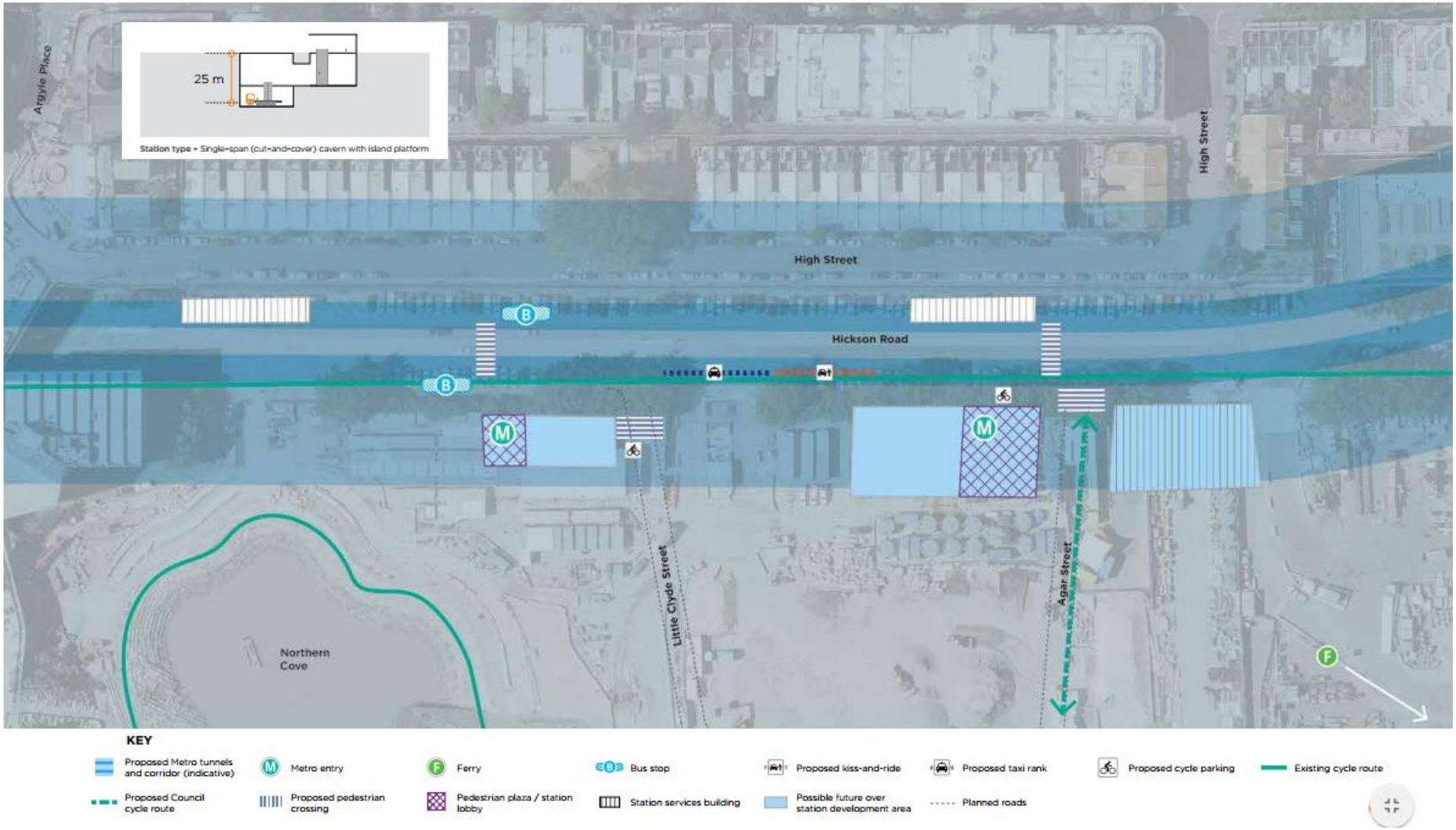
The site is broadly accessible by public transport with bus, train and ferry stops located within 1.5 kilometre of the site.

Whilst exact details are not yet known, there will be a substantial increase in the provision of public transport further into the future. The proposed CBD and South East light rail, new bus routes, the Sydney South East and CBD Metro (Sydney Metro) and new Barangaroo ferry wharves will all improve accessibility to the precinct.

Such infrastructure projects include the development of the Sydney Metro, which is to have a station at Barangaroo as is shown in Figure 5.2. Based on the indicative station location within the Sydney Metro Environmental Impact Statement (EIS), the precinct will subsequently be located well within the acceptable 800 metre access radius of a train station.

The Sydney Metro is anticipated to commence operation in 2024 with services provided every four minutes during the peak periods.

Figure 5.2: Indicative Sydney Metro Barangaroo station location



Source: http://www.sydneymetro.info/sites/default/files/document-library/Sydney%20Metro%20Southwest%20Chatswood%20to%20Sydenham%20summary.pdf, pg. 69, accessed 22 August 2016

Though outside of the precinct, the Sydney City Centre Access strategy clearly defines that new bus routes and new ferry wharves will be provided to the Barangaroo site, and Circular Quay is set to undergo a broader revitalisation project. This is shown in Figure 5.3.

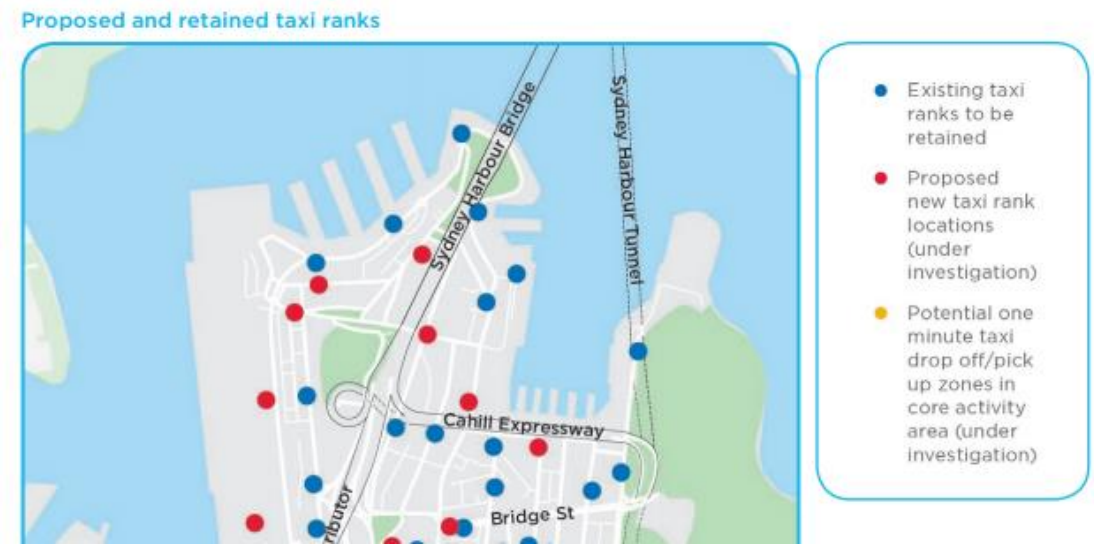
Figure 5.3: Public transport access summary

Source: http://www.transport.nsw.gov.au/sites/default/files/b2b/publications/sydney-city-centre-access-strategy-final-web.pdf, pg. 7, accessed 22 August 2016

The proposed Barangaroo ferry hub is currently under construction and is expected to be completed by the end of 2016, and begin operation by early 2017. The recently completed Wynyard Walk (October 2016) will provide a direct and key pedestrian connection between the new ferry wharf, and existing rail/ bus services and proposed light rail services in the CBD.

Figure 5.4 shows that three new taxi ranks are currently being investigated for implementation surrounding the precinct. Given that taxis are likely to be a primary access mode to the site for patrons, this is considered appropriate. In the short term, these facilities would be provided through changes to existing signage, but in the longer term, higher quality facilities might be incorporated into the streetscape design as recommended by the Harbour Village North Public Domain Study (City of Sydney, 2012)

Figure 5.4: Taxi rank access



Source: http://www.transport.nsw.gov.au/sites/default/files/b2b/publications/sydney-city-centre-access-strategy-final-web.pdf, pg. 31, accessed 22 August 2016

Figure 5.5 shows that Hickson Road is to be a 'key bus corridor', such a corridor would be expected to further develop as light rail construction progresses (and is ultimately completed), as well as the development of Barangaroo and the construction of the Sydney Metro.

Figure 5.5: Strategic bus corridors

Source: http://www.transport.nsw.gov.au/sites/default/files/b2b/publications/sydney-city-centre-access-strategy-final-web.pdf, pg. 39, accessed 22 August 2016

6. Loading Facilities

6.1 Loading Requirements

The City of Sydney provided the most relevant comparison for requirements for loading for the proposed development. Development Control Plan (DCP) 2012 sets out rates for loading facilities for different development types. A review of these rates and the floor area schedule results in a requirement as summarised in Table 6.1.

Table 6.1: Loading requirements

Use	Size (gross floor area [GFA])	Loading rate	Loading requirement
Commercial	16,500 m²	1 space per 3,300 m² GFA, or part thereof	5

6.2 Proposed Loading Arrangements

Whilst the exact number of loading vehicle movements to and from the site is not known at this stage, it is anticipated that between the new loading dock on Pier 2/3, the existing loading dock on Wharf 4/5 and the on-street loading provisions, there will be adequate loading capacity to cater for the demands generated by the additional uses. In addition, a loading dock management system could be implemented to ensure efficient use of the available space.

6.3 Vehicle Swept Paths

GTA has reviewed the proposed loading provisions. In this regard, the existing loading arrangements for Wharf 4/5 will be maintained and as such, this assessment only considers the loading requirements for Pier 2/3.

A loading platform and/or leveller would be constructed on the east side of Pier 2/3. The arrangement would require the loading vehicle drive past the platform and reverse adjacent to the building. The loading vehicle would then travel to the northern end of the pier where it would turn around and then travel back along the pier to Hickson Road.

The existing apron is generally 5.8 metres wide and whilst not strictly in accordance with AS2890.2-2002 (which requires 6.2 metres for two medium rigid vehicles (MRVs) to pass), would allow two small rigid vehicles (SRVs) to physically pass, noting some localised constraints associated with existing services (e.g. fire hydrant). Any passing movements would need to be undertaken with one vehicle parked hard up against the building or edge of the wharf and the other vehicle at low speed. However, it is noted that at the colonnade, the apron width reduces to approximately four metres wide, with vehicles not able to pass at this location. The width of the apron precludes two MRVs being able to pass each other (or one SRV and one MRV). The available facilities and associated heritage-related constraints are expected to be appropriate for the low service vehicle activity levels.

A swept path assessment of the proposed loading arrangement for Pier 2/3 has been undertaken using AutoTURN (a computer package designed to simulate vehicle swept paths in a CAD environment). The assessment indicates:

- A SRV (6.4 metres) is able to turn around at the end of Wharf 4/5 with a three-point turn
- A MRV (8.8 metres) is able to turn around at the end of Pier 2/3 with a five-point turn.

This manoeuvring is consistent with current operation of the loading facilities.

7. Traffic Impact Assessment

The ability of the site to generate traffic is restricted by the zero on-site car parking provision, however, the redevelopment of the site will still generate traffic movements as a result of the following:

- Loading vehicle trips to the site
- Taxi trips to the site
- Pick up and drop off trips to the site
- Private vehicle trips to the site utilising nearby on- and off-street car parking within the precinct
- Due to a relative lack of access, at least in the short term, public transport is not expected to be a preferred mode choice.

Traffic generation for the proposal has been estimated with regards to the Barangaroo Integrated Transport Plan. This is appropriate given the proximity of the WBAP to Barangaroo. The Plan outlines an intention of 85 per cent access to Barangaroo by public transport, 10 per cent by walking and cycling, and five per cent by private vehicle.

Extrapolating estimated staff and visitor numbers for the site (population of 3,040 including 950 staff and 2,100 visitors) with the mode share estimates outlined above, and with consideration of existing ABS journey to work data, Table 7.1 has been developed to identify the likely number of trips by each mode.

Table 7.1: Future transport demands

Mode	Share	Trips
Train	33%	1,003
Bus	33%	1,003
Walk	17%	517
Car	8%	243
Bicycle	2%	61
Ferry	3%	91
Taxi	4%	122
Total	100%	3,040 [1]

[1] It has been conservatively assumed that the site's daily population would arrive during the same peak hour.

With consideration of the above estimates of future transport demands, Table 7.2 shows an anticipated worst case scenario with regards to traffic impact.

Table 7.2: Traffic generation estimation

Mode	Persons arriving	Average vehicle occupancy	Trip generation
Taxi	122	2	91
Private Vehicle (including pick up/drop off)	243	2	122
Loading Vehicle	-	-	<10
Total			**192**

[1] Includes the overall number of people access the site during the site. Number of vehicle movements maybe less depending on vehicle occupancy.

Table 7.2 indicates that the site is anticipated to generate some 192 vehicles during the site peak hour. The additional traffic equates to three additional vehicle movements every minute.

As shown in Figure 2.4, at the weekday site peak period of 6pm to 7pm, Hickson Road sees a peak volume of 697 vehicles per hour. The proposed redevelopment would then increase the peak period traffic volume to 889 vehicles per hour, which equates to a 28 per cent increase.

It is important to note that peak traffic generation for the site does not necessarily correspond with the road peak period. The road peak period occurs on Saturday 1pm with a surveyed 836 vehicles per hour.

The result indicates that the proposed traffic generation from the site would exceed existing traffic volumes by 53 vehicles per hour, which is less than one vehicle per minute. In this regard, the additional traffic generated by the proposed development could not be expected to compromise the safety or function of the surrounding road network.

This forecast accounts for day-to-day operation of the site. During defined major events, traffic demands would be managed by a Transport Management Plan.

8. Conclusion

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

i The proposed development is permitted a maximum statutory parking requirement of 550 spaces. The development meets statutory requirements with no on-site parking provision proposed for the site.

ii Sufficient on-street and off-street parking is available within the precinct, noting the focus on promoting non-car based travel modes. A preliminary Green Travel Plan has plan has been prepared as part of the Stage 2 SSDA requirements.

iii 25 secure bicycle parking facilities will be provided on site for staff with visitor bicycle parking racks provided in the public domain (with capacity for approximately 80 bicycles). Additional bicycle spaces would be provided in the future subject to demand.

iv The proposed development has statutory requirement for five loading bays. It is proposed to accommodate this loading requirement within the existing and proposed loading facilities and on-street loading bays through appropriate loading dock management.

v The site is conservatively expected to generate up to 192 vehicle movements per hour during its peak usage. There is adequate capacity in the surrounding road network to cater for the traffic generated by the proposed development.

vi The existing site access arrangements would be altered to create more pedestrian-friendly environment, responding appropriately to both typical operation and event mode needs.

vii The forecasts in this report accounts for day-to-day operation of the site. During defined major events, traffic demands would be managed through an Event Transport Management Plan. A preliminary plan has been prepared as part of the Stage 2 SSDA requirements.

Appendix A

Automatic Tube Count Survey

Job No	N2600
Client	GTA
Site	Hickson Road (adj. Pier 4)
Location	DAWES POINT
Site No	1
Start Date	27-Aug-16
Description	Volume Summary
Direction	EB

MATRIX Traffic and Transport Data

Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	27-Aug	28-Aug		
AM Peak	370	394	371	0	0	300	210		
PM Peak	377	451	443	0	0	494	385	**3243**	**3847**
00:00	53	51	69	0	0	195	192	35	80
01:00	20	14	30	0	0	119	150	13	48
02:00	14	22	17	0	0	64	89	11	29
03:00	20	25	17	0	0	40	36	12	20
04:00	31	26	28	0	0	47	54	17	27
05:00	52	62	52	0	0	45	60	33	39
06:00	122	181	152	0	0	101	57	91	88
07:00	278	270	282	0	0	114	81	166	146
08:00	370	394	345	0	0	223	118	222	207
09:00	348	389	371	0	0	255	166	222	218
10:00	273	332	306	0	0	267	177	182	194
11:00	286	382	345	0	0	300	210	203	218
12:00	309	340	383	0	0	409	255	206	242
13:00	271	317	352	0	0	494	278	188	245
14:00	244	256	301	0	0	341	385	160	218
15:00	271	295	328	0	0	330	239	179	209
16:00	276	292	324	0	0	397	253	178	220
17:00	371	337	335	0	0	437	283	209	252
18:00	377	451	443	0	0	493	255	254	288
19:00	233	343	355	0	0	437	239	186	230
20:00	274	189	238	0	0	375	164	140	177
21:00	201	265	302	0	0	415	164	154	192
22:00	132	269	285	0	0	416	105	137	172
23:00	105	124	0	0	0	306	81	46	88
Total	4931	5626	5660	0	0	6620	4091	3243	3847

7-19	3674	4055	4115	0	0	4060	2700	2369	2658
6-22	4504	5033	5162	0	0	5388	3324	2940	3344
6-24	4741	5426	5447	0	0	6110	3510	3123	3605
0-24	4931	5626	5660	0	0	6620	4091	3243	3847

Job No	N2600
Client	GTA
Site	Hickson Road (adj. Pier 4)
Location	DAWES POINT
Site No	1
Start Date	27-Aug-16
Description	Volume Summary
Direction	WB

MATRIX Traffic and Transport Data

Hour Starting	Day of Week							W'Day Ave	7 Day Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	27-Aug	28-Aug		
AM Peak	268	290	272	0	0	236	186		
PM Peak	241	265	316	0	0	342	269	**2262**	**2670**
00:00	38	41	34	0	0	75	178	23	52
01:00	18	20	19	0	0	39	67	11	23
02:00	14	9	12	0	0	21	53	7	16
03:00	10	9	11	0	0	10	21	6	9
04:00	15	11	15	0	0	30	19	8	13
05:00	28	30	29	0	0	21	38	17	21
06:00	92	103	104	0	0	55	38	60	56
07:00	200	195	215	0	0	106	55	122	110
08:00	268	280	257	0	0	161	89	161	151
09:00	255	290	270	0	0	192	158	163	166
10:00	212	243	219	0	0	236	141	135	150
11:00	232	262	272	0	0	231	186	153	169
12:00	214	242	299	0	0	286	227	151	181
13:00	190	233	284	0	0	342	205	141	179
14:00	197	196	233	0	0	229	269	125	161
15:00	196	232	253	0	0	259	183	136	160
16:00	197	206	228	0	0	314	200	126	164
17:00	238	265	220	0	0	289	166	145	168
18:00	241	262	316	0	0	266	147	164	176
19:00	158	231	254	0	0	276	128	129	150
20:00	0	123	162	0	0	218	116	57	88
21:00	0	252	227	0	0	266	88	96	119
22:00	102	184	192	0	0	324	81	96	126
23:00	53	96	0	0	0	220	61	30	61
Total	3168	4015	4125	0	0	4466	2914	2262	2670

7-19	2640	2906	3066	0	0	2911	2026	1722	1936
6-22	2890	3615	3813	0	0	3726	2396	2064	2349
6-24	3045	3895	4005	0	0	4270	2538	2189	2536
0-24	3168	4015	4125	0	0	4466	2914	2262	2670

Appendix B

Pier 4 Loading Dock Access Survey

Job No.	: N2600
Client	: GTA
Suburb	: Dawes Point
Location	: Pier 4 (Sydney Theatre Company) Loading Docks
Day/Date	: Wed, 31st August 2016
Weather	: Fine
Description	: Classified Loading Dock Utilisation Counts
	: 15 mins Data

	Class 1	Class 2
Classifications	Lights	Heavies

Approach	**Access 1 (Hickson Road)**						**Access 2 (Pottinger Street)**					
Direction	**IN**			**OUT**			**IN**			**OUT**		
Time Period	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**	**Lights**	**Heavies**	**Total**
07:00 to 07:15	0	0	**0**	0	0	**0**	0	1	**1**	0	1	**1**
07:15 to 07:30	0	0	**0**	0	0	**0**	1	0	**1**	0	0	**0**
07:30 to 07:45	0	0	**0**	0	0	**0**	1	0	**1**	1	0	**1**
07:45 to 08:00	0	0	**0**	0	0	**0**	0	1	**1**	0	0	**0**
08:00 to 08:15	2	0	**2**	0	0	**0**	0	0	**0**	1	0	**1**
08:15 to 08:30	0	0	**0**	1	0	**1**	0	0	**0**	0	0	**0**
08:30 to 08:45	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
08:45 to 09:00	0	0	**0**	1	0	**1**	0	1	**1**	0	0	**0**
09:00 to 09:15	0	0	**0**	1	0	**1**	1	0	**1**	0	1	**1**
09:15 to 09:30	0	0	**0**	1	0	**1**	0	0	**0**	1	1	**2**
09:30 to 09:45	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
09:45 to 10:00	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
3hr Totals	**2**	**0**	**2**	**4**	**0**	**4**	**3**	**3**	**6**	**3**	**3**	**6**

Appendix C

Pedestrian and Cyclist Survey

Job No.	: N2600
Client	: GTA
Suburb	: Barangaroo
Location	: Hickson Road
	: Entrance to Sydney Theatre Company (Pier 4)
Day/Date	: Sat, 27th August 2016
Weather	: Fine
Description	: Pedestrian & Cyclist Counts
	: 15 mins Data

	Class 1	Class 2
Classifications	Peds	Cyclists

Direction			IN			OUT		
Time Period			Peds	Cyclists	Total	Peds	Cyclists	Total
18:00	to	18:15	49	0	**49**	22	0	**22**
18:15	to	18:30	46	0	**46**	38	0	**38**
18:30	to	18:45	51	0	**51**	47	0	**47**
18:45	to	19:00	46	0	**46**	23	0	**23**
19:00	to	19:15	49	0	**49**	19	0	**19**
19:15	to	19:30	52	0	**52**	19	0	**19**
19:30	to	19:45	98	0	**98**	56	0	**56**
19:45	to	20:00	97	0	**97**	52	0	**52**
20:00	to	20:15	10	0	**10**	8	0	**8**
20:15	to	20:30	15	0	**15**	11	0	**11**
20:30	to	20:45	9	0	**9**	2	0	**2**
20:45	to	21:00	18	0	**18**	4	0	**4**
21:00	to	21:15	20	0	**20**	12	0	**12**
21:15	to	21:30	0	0	**0**	167	0	**167**
21:30	to	21:45	1	0	**1**	73	0	**73**
21:45	to	22:00	0	0	**0**	23	0	**23**
4hr Totals			**561**	**0**	**561**	**576**	**0**	**576**

Job No.	: N2600
Client	: GTA
Suburb	: Dawes Point
Location	: Hickson Road
	: Entrance to Sydney Theatre Company (Pier 4)
Day/Date	: Wed, 31st August 2016
Weather	: Fine
Description	: Pedestrian & Cyclist Counts
	: 15 mins Data

	Class 1	**Class 2**
Classifications	Peds	Cyclists

Direction			**IN**			**OUT**		
Time Period			**Peds**	**Cyclists**	**Total**	**Peds**	**Cyclists**	**Total**
07:00	to	07:15	2	0	**2**	2	0	**2**
07:15	to	07:30	2	0	**2**	1	0	**1**
07:30	to	07:45	1	0	**1**	1	0	**1**
07:45	to	08:00	8	0	**8**	2	0	**2**
08:00	to	08:15	13	1	**14**	2	0	**2**
08:15	to	08:30	14	0	**14**	9	0	**9**
08:30	to	08:45	12	0	**12**	2	0	**2**
08:45	to	09:00	21	0	**21**	3	0	**3**
09:00	to	09:15	26	0	**26**	2	0	**2**
09:15	to	09:30	23	0	**23**	6	0	**6**
09:30	to	09:45	14	0	**14**	5	0	**5**
09:45	to	10:00	11	1	**12**	1	0	**1**
10:00	to	10:15	9	0	**9**	6	0	**6**
10:15	to	10:30	49	0	**49**	3	0	**3**
10:30	to	10:45	51	2	**53**	45	0	**45**
10:45	to	11:00	27	0	**27**	5	0	**5**
11:00	to	11:15	81	0	**81**	17	0	**17**
11:15	to	11:30	30	0	**30**	16	0	**16**
11:30	to	11:45	22	1	**23**	17	0	**17**
11:45	to	12:00	18	0	**18**	8	0	**8**
12:00	to	12:15	6	0	**6**	14	0	**14**
12:15	to	12:30	19	0	**19**	10	0	**10**
12:30	to	12:45	24	0	**24**	42	0	**42**
12:45	to	13:00	20	0	**20**	36	0	**36**
6hr Totals			**503**	**5**	**508**	**255**	**0**	**255**

Appendix D

Parking Demand Survey

Client	GTA
Location	Hickson Road, Dawes Point
Date	Saturday, 27th August 2016
Description	Parking Occupancy Survey

MATRIX Traffic and Transport Data

Area	Spaces	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00
North Side (KERB)	**52**	28	37	39	43	42	39	38	29	34	43	47	47
South Side (KERB)	**30**	10	10	12	11	17	20	15	4	8	17	24	24
North Side (MEDIAN)	**75**	49	54	59	68	70	63	59	44	60	67	67	67
South Side (MEDIAN)	**76**	28	43	42	52	56	55	37	28	36	57	65	65
Total	**233**	**115**	**144**	**152**	**174**	**185**	**177**	**149**	**105**	**138**	**184**	**203**	**203**
% Capacity		**49%**	**62%**	**65%**	**75%**	**79%**	**76%**	**64%**	**45%**	**59%**	**79%**	**87%**	**87%**

Client	GTA
Location	Hickson Road, Dawes Point
Date	Wednesday, 31st August 2016
Description	Parking Occupancy Survey

MATRIX Traffic and Transport Data

Area	Spaces	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00
North Side (KERB)	**52**	24	24	31	29	28	18	18	18	26	36	47	43
South Side (KERB)	**30**	8	7	7	11	12	11	7	12	14	15	18	13
North Side (MEDIAN)	**75**	32	40	42	52	41	22	25	32	39	64	63	55
South Side (MEDIAN)	**76**	26	31	34	48	44	27	27	36	40	48	50	47
Total	**233**	**90**	**102**	**114**	**140**	**125**	**78**	**77**	**98**	**119**	**163**	**178**	**158**
% Capacity		**39%**	**44%**	**49%**	**60%**	**54%**	**33%**	**33%**	**42%**	**51%**	**70%**	**76%**	**68%**

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