

Transport

Traffic Management and Accessibility Plan (TMAP)

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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.

The following Traffic Management and Accessibility Plan sets out an assessment of the transport impacts of the proposed development as well as an assessment of the Director General's Requirements (reproduced in Section 1.2).

The report has been updated to reflect feedback received from the various Government Agencies following the submission of the SSDA.

GTA Consultants (GTA) was commissioned by Savills, on behalf of Arts NSW, in October 2013 to undertake a transport impact assessment of the proposed development.

1.2 Director General's Requirements (DGR's)

In July 2013, MG Planning on behalf of Arts NSW requested the Director General's Requirements (DGR's) for the Walsh Bay Arts Precinct Stage 1 State Significant Development Application. A number of DGR's were received including those pertaining to traffic and transport provided in Table 1.

Director General's Requirements	Response	Section
<i>Department of Planning and Infrastructure</i>		
Demonstrate the provision of sufficient on-site car parking for the development. Provide accurate details of daily vehicle movements and assess the impacts of proposed traffic generation on the local road network and intersection capacity, having regard to local planning controls and planned and approved developments in the area, in particular Barangaroo. Identify public transport links to and from the site, including ferry, bus, bicycle and pedestrian links and outline disabled access to the site.	No on-site car parking is proposed for visitors and staff. Such an approach is consistent with City of Sydney and TfNSW policy. Limiting car parking provision reduces the ability for the site to generate traffic onto a network that already experiences congestion during road network peak hours. The existing and planned future sustainable transport links to the site have been identified.	Sections 3, 6 and 8
<i>Transport for NSW</i>		
Assess the cumulative traffic and transport impacts on the local road network considering other approved and planned developments in the area, in particular Barangaroo redevelopment project.	The site is anticipated to generate up to 120 peak hour movements. The peak traffic generation from the site is anticipated to occur in the evening outside of the road network peak hour.	Section 8
Details of all service vehicle movements and loading dock arrangements.	A new loading facility is to be provided on Pier 2/3 and will	Section 9

	complement the existing facility provided on Wharf 4/5 and the on-street loading provisions.	
<i>NSW Police</i>		
The development of the WBAP as well as site activations is likely to have significant impact in relation to vehicle access and pedestrian access to the site. Major events such as the Vivid Festival have seen significant crowds moving around the Harbour foreshore areas as well as significant vehicular challenges (parking and access) due to crowds. The increase in focus on events and festivals for WBAP is something that NSWPF would be keen to be part of discussion with key agencies to contribute to strategies to manage this aspect of the development.	<p>This application deals with the day to day operation of the site rather than event modes which will be dealt with by a separate application process.</p> <p>A Transport Management Plan (TMP) would be prepared that will detail the temporary public transport, pedestrian, taxi and vehicle arrangements for event mode operation. Relevant agencies, including NSW Police, City of Sydney and TfNSW will be consulted as part of the preparation of the TMP.</p>	Section 5

Table 1: Summary of DGR's

2. Site and Project Description

2.1 Background

Arts NSW is proposing to develop a new arts precinct at Walsh Bay which will expand and strengthen the existing cluster of cultural institutions and attractions along Sydney's "Arts and Cultural Ribbon". The arts precinct includes Wharf 4/5, Pier 2/3 and Sydney Theatre. The concept provides for an integrated performing arts and cultural precinct within an enhanced public domain at Walsh Bay. It is envisaged that the arts and cultural program within the Walsh Bay Arts Precinct (WBAP) will complement the other cultural initiatives in surrounding areas, including those proposed at nearby Barangaroo (currently under development).

In 2011/12 Arts NSW engaged the NSW Government Architect to prepare a master plan for the precinct. The master plan proposed:

- the transformation of Pier 2/3 to accommodate the Australian Chamber Orchestra, Bell Shakespeare and Australian Theatre for Young People
- the retention of a large "raw" space in Pier 2/3 for events, festivals and functions
- a major upgrade of ground floor facilities at Wharf 4/5, allowing Bangarra to confirm its place as the premier Indigenous performing arts company and maximise new tourist and engagement opportunities
- the expansion of creative and commercial activities along the shore sheds offering cafes, restaurants, retail and commercial activities to further enhance the visitor experience
- a new north facing waterfront square supported with new boardwalks which will significantly increase public open space and create a central platform for activity, collaborative outdoor performances, events, festivals and public art.

2.2 The Site and Surrounds

The WBAP site is part of the Walsh Bay area which is located adjacent to Sydney Harbour within the suburb of Dawes Point. 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.

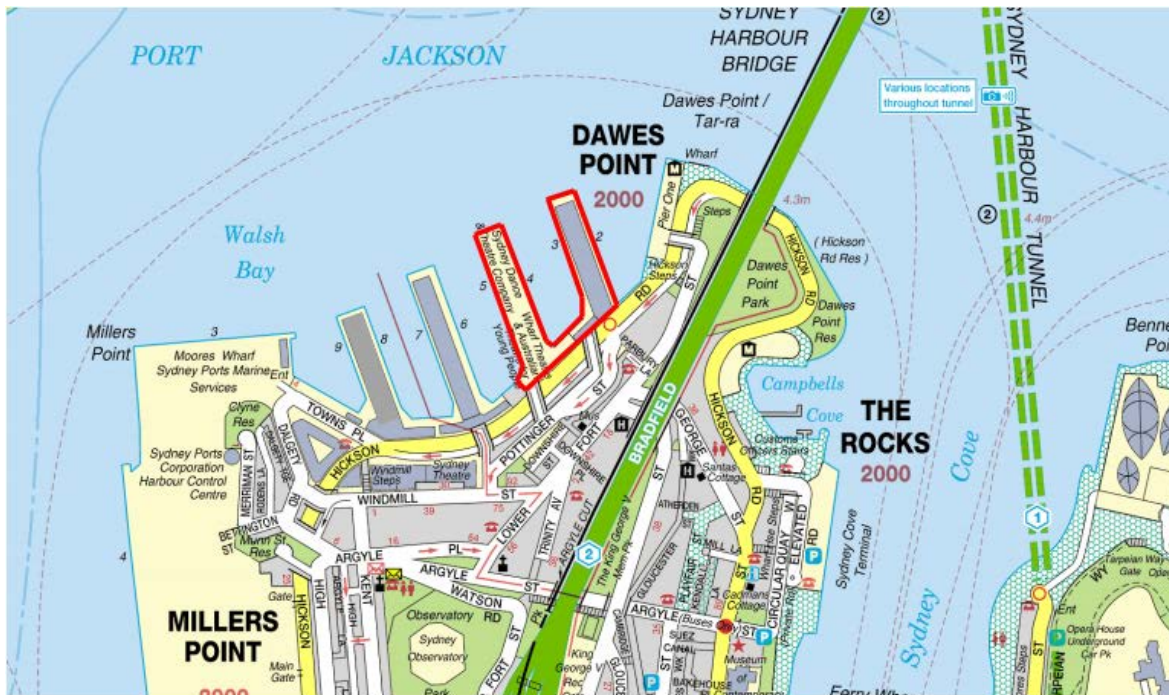


Figure 1: Site Location (Source: UBD Digital Edition 2004)

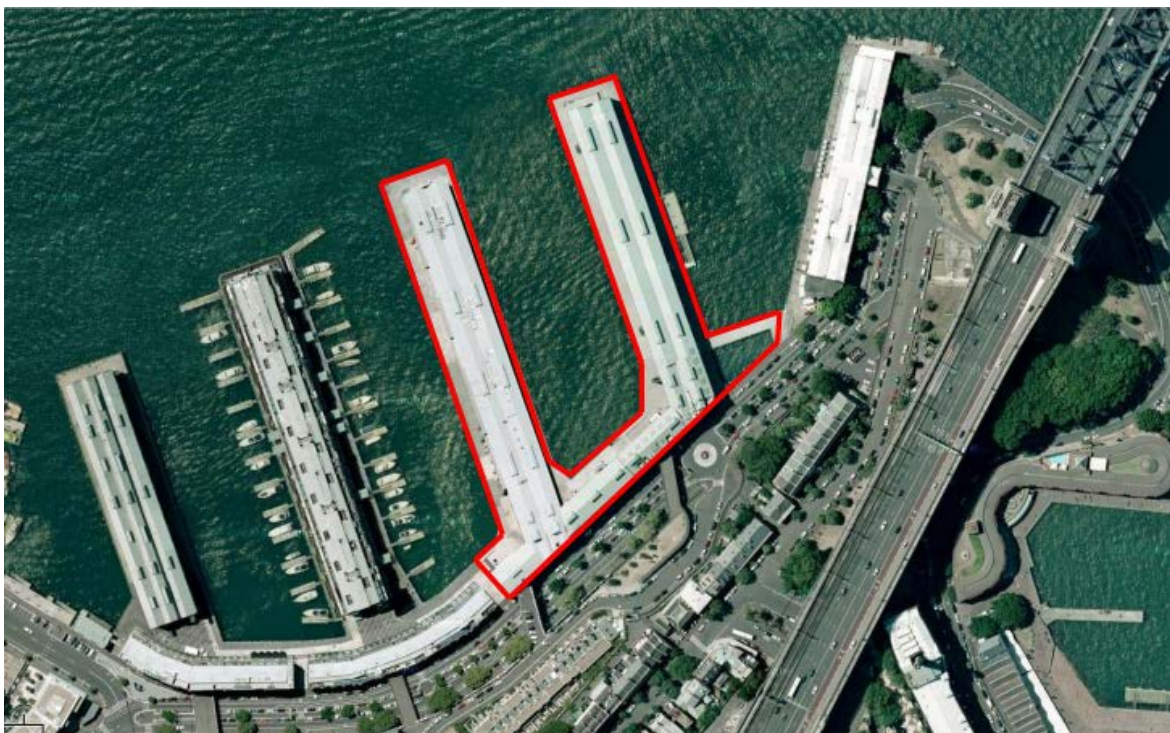


Figure 2: WBAP site (Source: Google Maps)

Walsh Bay comprises ten berths constructed between 1908 and 1922 for international and inter-state 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. Much of Walsh Bay (excluding Wharf 4/5 and Pier 2/3) was redeveloped between 1997 and 2004 by the NSW Government in partnership with the Walsh Bay Partnership (Mirvac and Transfield). The Walsh Bay Wharves comprise the following:

- Pier One which contains the Sebel Pier One Sydney Hotel

- Pier 2/3 is the last remaining undeveloped pier. It has approval for cultural uses, temporary arts events and some commercial events.
- Wharf 4/5 which is occupied by the Sydney Theatre Company, Australian Theatre for Young People, Bangarra Dance Theatre and other arts organisations.
- Pier 6/7 which has been redeveloped for residential apartments and associated boat marina
- Pier 8/9 which has been redeveloped for office uses
- Shore Sheds which contain a range of commercial activities, including restaurants, bars, shops and offices.

The Sydney Theatre is within the WBAP however it is not part of the proposed redevelopment. Given the significant difference in grade between Walsh Bay and Millers Point, there are a number of bridges over Hickson Road which provide pedestrian access between the site and Millers Point. The bridge linking Pottinger Street and Wharf 4/5 is also used for vehicular parking. To the south-west of the wharves is Hickson Road, which provides the major vehicular access to the site. Hickson Road links the site to Barangaroo to the south-west and Circular Quay and The Rocks to the north-east. Other roads providing access to the site include Pottinger Street which provides access to Millers Point, and Towns Place which also provides access to Millers Point via Dalgety Road and Argyle Street.

The Barangaroo redevelopment project to the south of Walsh Bay comprises three redevelopment areas – the Headland Park, Central Barangaroo and Barangaroo South. The Headland Park is to be located adjacent to the Walsh Bay Precinct and is currently under construction. The park is being built up to reflect a similar landform to other headlands around Sydney Harbour. It is proposed that a 300 space car park and an as yet undefined cultural facility will be located inside the headland. Master planning for Central Barangaroo is currently underway with the intention that it will be the cultural and civic focal point for recreation, events and entertainment. Barangaroo South is being developed as a major commercial and mixed use centre.

2.2.1 Pier 2/3

Pier 2/3 is a finger wharf comprising two storeys (and associated shore sheds) and was constructed between 1912 and 1921. It is Sydney's last wharf structure in its original state. Much of it is an empty shell however it does contain some commercial uses. There is a 99 year lease between the Maritime Authority of NSW (now Roads and Maritime Services) and Communities NSW (which now rests with Arts NSW, Department of Trade and Investment) for the finger wharf, the portion of open air wharf apron, the pedestrian link bridge and the wharf substructure. The granting of this lease, amongst other things, allows Pier 2/3 to be used for arts, cultural and creative purposes. The City of Sydney has granted consent for Pier 2/3 to be used as a cultural facility for a range of uses such as rehearsals, exhibitions, workshops, filming and events, including the Sydney Writers' Festival and the Biennale of Sydney. The consent was granted on 21 September 2011 and is for a period of 3 years.

2.2.2 Wharf 4/5

Wharf 4/5 is a four storey timber building which was built around 1917 and used as a steamship berthing and cargo storage facility until the mid 1970s. The Wharf has been progressively upgraded and adaptively reused since the early 1980s. Ten arts and cultural organisations use the facility which comprises a range of performance venues, rehearsal and workshop spaces, a recording studio, café/restaurants and office accommodation.

Wharf 4/5 is recognised as a highly successful adaptive reuse of an important heritage item. Its redevelopment 30 years ago was the subject of numerous architectural and design awards. However, many of its spaces are not fit for purpose and use of the space is not optimised.

2.3 Nearby Development (Barangaroo)

The Barangaroo redevelopment project to the south of Walsh Bay comprises three redevelopment areas – the Headland Park, Central Barangaroo and Barangaroo South. The Headland Park is to be located adjacent to the Walsh Bay Precinct and is currently under construction. The park is being built up to reflect a similar landform to other headlands around Sydney Harbour. It is proposed that a 300 space car park and an as yet undefined cultural facility will be located inside the headland. Master planning for Central Barangaroo is currently underway with the intention that it will be the cultural and civic focal point for recreation, events and entertainment. Barangaroo South is being developed as a major commercial and mixed use centre.

Arts NSW and the Walsh Bay Arts Precinct project team have led ongoing discussions with the Barangaroo Delivery Authority (BDA) in order to identify opportunities to integrate Walsh Bay Arts Precinct transport demand with initiatives and provisions being developed and implemented by BDA.

2.4 The Project

The Concept Design more than doubles the arts and cultural offerings at Walsh Bay, with new and upgraded production, rehearsal, studio and performance venues. It remains a working arts precinct, with complimentary commercial opportunities.

Following the Master Plan, the Concept Design has responded to stakeholder feedback and greater design investigation, resulting in a more resolved concept, with the following key differences from the Master Plan:

- Floating pontoons and connecting bridge have been removed;
- Heritage impacts have been interrogated and minimised;
- Internal planning has been further articulated to meet arts tenants requirements
- A stage area canopy has been introduced into the waterfront square.

The main features of the development of Pier 2/3 include:

- New homes for Bell Shakespeare, Australian Chamber Orchestra and the Australian Theatre for Young People, including office accommodation, rehearsal space and performance spaces
- Retention of raw heritage space for a range of events and functions, with some improved ancillary facilities.

The proposed refurbishment of Wharf 4/5 ground floor includes:

- Upgraded facilities for Bangarra Dance Theatre and Sydney Dance Company (Sydney Theatre Company facilities are not included in this proposed development)
- Several arts organisations - Accessible Arts, Regional Arts, and the choirs are to relocate from this building.

The proposed modifications to Wharf 4/5 Shore Sheds include the provision of upgraded choir's office accommodation and rehearsal space, and new commercial spaces.

The Waterfront Square has been further developed from the public domain proposed in the Master Plan to include a central square for events, festivals, markets and public art. As noted above, the pontoons and bridges have been removed and a shade structure/canopy has been introduced over the notional stage area of the Waterfront Square.

3. Site analysis

At a glance

The site currently has relatively limited access to existing public transport facilities, however, Hickson Road has been identified within the Sydney City Centre Access Strategy (SCCAS) as a key bus corridor and as such, public transport access to the site will be vastly improved in the future. The Harbour Village North Public Domain Study envisages a number of upgrades to the pedestrian environment in the vicinity of the site and along the Hickson Road corridor itself. Car parking in the vicinity of the site is generally at or near capacity during peak periods coinciding with the surrounding entertainment uses (evenings).

3.1 Transport Context

NSW Long Term Transport Master Plan (2012)

The NSW Long Term Transport Master Plan sets the framework for the NSW Government to deliver an integrated, modern transport system. The final version of the NSW Long Term Transport Master Plan was released in December 2012 and sets out 220 short, medium and long term actions to integrate, grow, modernise and manage the transport network across NSW.

Whilst the Master Plan does not provide any specific actions for the Walsh Bay Precinct, it does inform a number of other major transport studies referenced throughout this section (including Sydney's Ferry Future, Light Rail Planning, SCCAS).

3.2 Public Transport

3.2.1 Existing Situation

The site is located in the northwest corner of the Sydney CBD, in an area that, when compared currently to the remainder of the CBD, is relatively underserved by public transport. This is generally as a result of the site's location at the end of the peninsula separated from the remainder of the CBD by the vehicle approaches to the Sydney Harbour Bridge (Bradfield Highway and Cahill Expressway).

Circular Quay is located approximately 1.3km walk from the site (via George Street) and caters for ferry, train and bus services, as well as the future CBD light rail service. Wynyard Railway Station is located approximately 1.3km walk from the site. In addition, a number of bus routes service the site at various times, as follows:

- #431: to Glebe Point (5:00am to midnight – 5 to 15 minute intervals) on Argyle Street
- #433: to Balmain (5:00am to Midnight – 15 to 30 minute intervals) on Argyle Street
- #998: to City QVB (9:00pm to 4:30am Friday and Saturday nights) on Hickson Road

It is also noted that an existing on-site ferry berth is provided on the eastern side of Pier 2/3, however no regular route ferries stop.

3.2.2 Future Situation

Sydney City Centre Access Strategy (2013)

The SCCAS was released in December 2013 and identifies a number of initiatives to increase transport capacity into and out of the CBD. The SCCAS outlines details regarding future

works to the train, light rail, bus, vehicle, pedestrian and cycle networks into, out of and within the CBD.

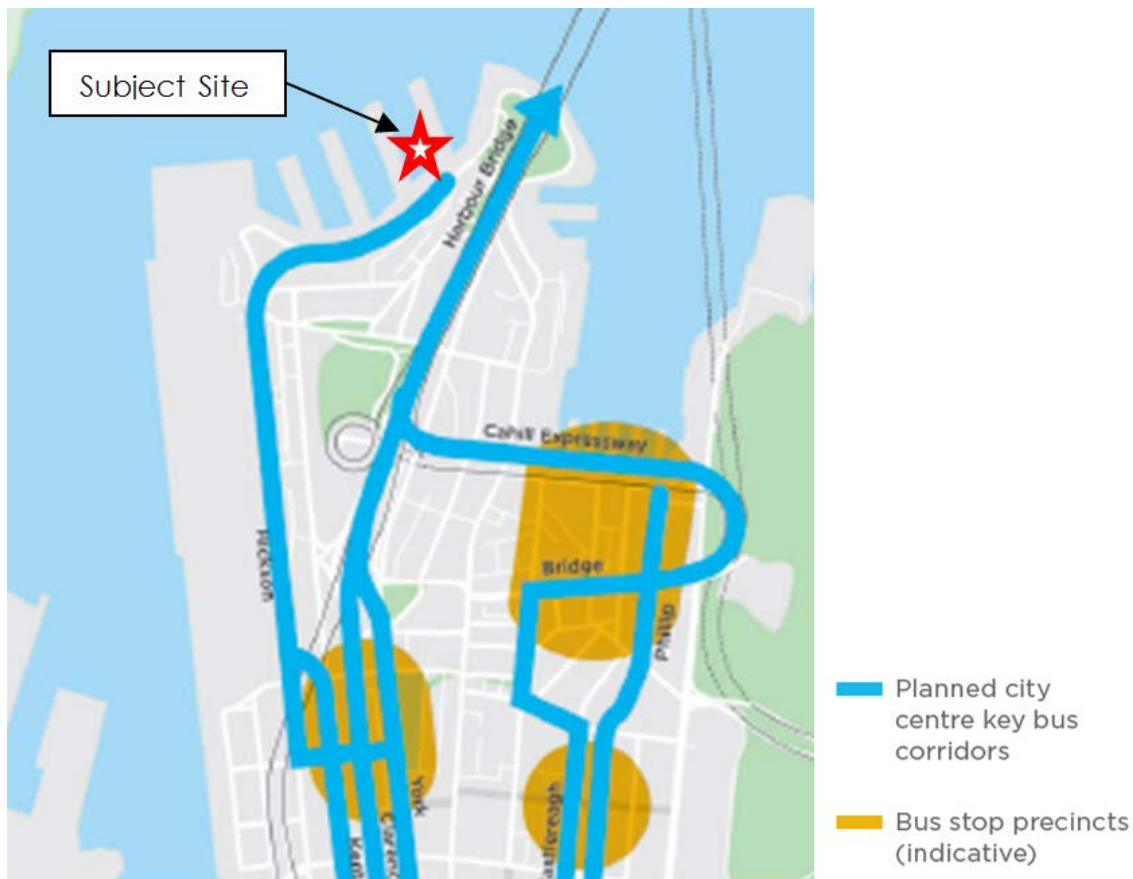
Specifically, the SCCAS identifies a number of measures and bus rerouting to improve and integrate bus services with the future CBD light rail service. In addition the SCCAS identifies a number of bus corridors that will accommodate high frequency bus services. Of particular note, it identifies the following:

“New bus routes will run to Barangaroo and Walsh Bay via the city centre and midtown interchange precinct.”

Advice from TfNSW indicates that a future bus frequency of 1 bus every 5 to 10 minutes off-peak (6 to 12 buses an hour) could be anticipated on Hickson Road, with greater frequencies during network peak hours¹. Service frequencies will reduce later in the evening. Bus stops are to be provided abutting the site on Hickson Road as well as on the eastern side of Hickson Road. It is envisaged that the new bus stops on Hickson Road (to be provided by TfNSW) will be designed in accordance with the Disability Standards for Accessible Public Transport 2002 (Disability Discrimination Act, 1992). The bus route(s) will terminate at Walsh Bay, with a bus layover area, capable of accommodating up to 2 buses, likely to be provided opposite the site on Hickson Road. It is understood that the buses servicing the site will operate between the Eastern Suburbs, Barangaroo and Walsh Bay, and will also service the Wynyard and Town Hall transport hubs in the CBD.

The priority bus routes identified within the SCCAS are illustrated in Figure 3.

¹ TfNSW meeting with WBAP project team, 25 February 2014.



**Figure 3: Future Bus Network - SCCAS
Sydney's Ferry Future (2013)**

The Sydney's Ferry Future document was released in May 2013 and outlines a 20 year plan for the ferry network. The document identifies a number of initiatives to improve the operation and capacity of the ferry network.

The document includes a review of 30 potential new locations that could be served by the ferry network, including the existing ferry berth at Walsh Bay. Each of the locations was assessed against the following:

- current and future demand with a focus on population, employment and attractions within the walking catchment of the wharf
- directness of the ferry route relative to the road alternative
- the costs of new infrastructure
- the frequency, cost, travel time and catchment of other modes compared to ferries

Five new potential ferry wharves were identified as part of the review. The Walsh Bay wharf was not identified as a potential future location, with subsequent advice from TfNSW indicating that there was not sufficient demand for a ferry service to Walsh Bay and that the precinct was adequately serviced by other public transport modes.

The Sydney's Ferry Future document identifies a new ferry hub to be located at Barangaroo in place of the existing King Street wharf at Darling Harbour. This new facility will be located

approximately 1.3km walking distance from Walsh Bay and will be integrated with Wynyard Railway Station via Wynyard Walk.

3.3 Walking and Cycling

3.3.1 Existing Situation

Pedestrian footpaths are generally provided on both sides of each of the roads in the vicinity of the subject site. There are good pedestrian links along the Sydney Harbour foreshore between the site and The Rocks precinct (suitable as an accessible route). There are also a number of pedestrian links (steps) between Hickson Road and Windmill Street and Lower Fort Street.

Bike lanes are provided on both sides of Hickson Road and connect the site to the greater CBD cycle network, shown in Figure 4. Bicycle parking (approximately 7 racks) are provided adjacent to the Pottinger Street/ Hickson Road roundabout.



Figure 4: Existing Cycle Network

3.3.2 Future Situation

Harbour Village North Public Domain Study (2012)

The Harbour Village North Public Domain Study sets out a number of ideas to improve the existing public areas controlled by the City of Sydney, including footpaths, roads, open space, parks and laneways.

Six guiding directions have been identified as part of the study and are reproduced below:

- “1. Improve access, connectivity and wayfinding.*
- 2. Create a network of linked parks and upgrade existing open spaces.*
- 3. Respect and celebrate heritage, conserve and restore Observatory Hill.*
- 4. Celebrate landform and harbour views.*
- 5. Support Walsh Bay cultural precinct and improve Cultural Ribbon connections.*
- 6. Strengthen local communities and support local economies.”*

Direction #5 identifies that improved pedestrian connections, wayfinding signage and public transport are critical to supporting the ongoing development of the precinct.

In addition, the study identifies ten priority projects and a number of longer term projects that would deliver the guiding directions identified above. One of the longer term projects identified is to improve the streetscape of Walsh Bay to improve pedestrian, cyclist and public transport facilities along Hickson Road. Specifically, the Study notes the following regarding Hickson Road:

“Transform Hickson Road from a car parking dominated space to a green boulevard with planting, separated cycleway and pedestrian crossings.”

Based on the above, it is envisaged that in the longer term, the number of on-street car parking spaces on Hickson Road will reduce. However, pedestrian access and amenity would be substantially improved; an outcome that is well aligned with the Walsh Bay Arts Precinct transport strategy.

NSW Planning Guidelines for Walking and Cycling (2004)

The Planning Guidelines for Walking and Cycling were prepared by the former NSW Department of Planning Infrastructure and Natural Resources (DIPNR) in 2004. These guidelines aim to assist land-use planners and related professionals to improve consideration of walking and cycling in their work. The guidelines have been designed to provide a walking and cycling focus to the NSW Government’s ‘Integrating Land Use and Transport Planning policy package’.

The guidelines highlight the benefits of planning for walking and cycling for the development industry, recognising that the marketability of developments can be enhanced by catering for people’s desires for healthy lifestyles.

The guidelines include detailed recommendations for the provision (design, quantity and quality) of end-of-trip facilities.

Sydney's Cycling Future (2013)

Sydney's Cycling Future was prepared by Transport for NSW and was released in December 2013 following the release of the NSW Long Term Transport Master Plan to provide a mode specific cycling strategy. It presents a new direction for bicycle infrastructure planning in metropolitan Sydney by focusing on people who would like to ride more often if cycling was made a safer and more convenient option. It aims to make cycling a feasible transport option for these people by:

- **investing** in separated cycleways and providing connected bicycle networks to major centres and transport interchanges
- **promoting** better use of existing infrastructure
- **engaging** with partners across government, councils, developers and bicycle users.

The strategy aims to prioritise investment on projects that have the greatest potential to get the most people to shift their short transport trips to bicycle. In order to achieve this, it aims to invest in connected routes within 5 kilometres of major centres and public transport interchanges. It proposes a three-tier hierarchy of safe cycleways to major centres:

- **Regional bicycle corridors** – highly used routes that connect to major destinations, on cycleways that are separate from motor vehicles and pedestrians.
- **Local bicycle network** – lower use corridors that connect to priority corridors and neighbourhood destinations within catchments.
- **Quiet local streets** – connecting residential destinations and local services in low traffic environments, design treatments make provision for people on bikes.

The subject site is ideally located to promote cycling as a viable transport mode for users of the site and in particular staff, noting the sites proximity to major transport interchanges at Circular Quay and Wynyard.

Barangaroo Cycle Links (TfNSW)

It is understood that TfNSW are currently investigating a number of cycling improvements to connect the existing bike network to the Barangaroo development. These improvements would in-turn improve accessibility to the Walsh Bay precinct.

3.4 Traffic

Hickson Road is classified as a local road (Council Controlled) and generally borders the northern boundary of the Sydney CBD. In the vicinity of the site, it is configured with single traffic and cycling lanes in each direction. On-street time restricted (generally 2P and 4P) car parking is provided on both sides of the carriageway as well as within the median.

Traffic counts undertaken in 2010 at the Hickson Road/ Towns Place intersection indicate that Hickson Road (west of Towns Place) carries approximately 5,000 vehicles per weekday². A number of other local roads are provided in the vicinity of the subject site, noting that no arterial or major roads are directly accessible from the site.

² Adopting a peak to daily ratio of 10% and noting peak hour traffic volumes of 480vph and 460vph in the AM and PM peak hours, respectively.

The Barangaroo development will generate significant traffic volumes on the road network to the south of the site. The majority of Barangaroo generated traffic is expected to travel south or east to the City rather than north along Hickson Road which generally only provides site access rather than a through route for vehicular traffic. Having regard for the proposed uses at Barangaroo, it is anticipated that the peak traffic generating times would be during the road network peak hours (i.e. 7:00 to 9:00am and 4:00 to 6:00pm).

3.5 Car Parking

3.5.1 Existing Situation

A number of on and off-street car parking facilities are provided in the vicinity of the site. On-street 2P and 4P car parking is generally provided on the road network surrounding the site. Two off-street car parking stations are located to the west of the site on Hickson Road, whilst a number of commuter car parking stations are located further afield in the northern part of the CBD.

Formal car parking demand surveys have not been undertaken as part of this study, however, it is understood that the existing public car parking surrounding the site is approaching capacity during peak activity periods, particularly on Friday and Saturday evenings associated with the surrounding entertainment uses.

Some informal car parking currently occurs on-site, this is further discussed in Section 4.

3.5.2 Future Situation

Discussions with BDA have indicated that a 300 space car park will be delivered as part of the Headland Park precinct, due for completion mid-2015. The car park will be attached to a future cultural facility (10,000 to 20,000sq.m floor area) to be constructed within the Headland Park precinct and will cater for the car parking requirements of the cultural facility and broader precinct (i.e. be publicly accessible). The provision of the car park was identified following consultation with the surrounding residents and stakeholders who identified an existing deficiency in publicly available car parking during peak demand times.

It is understood that the proposed cultural facility offering is yet to be finalised, with no operator engaged to-date. As such, the proposed car park would have significant capacity to meet Walsh Bay Arts Precinct demand in the short term, with the development of the cultural facility to follow at which point some car parking would likely still be available.

4. Development Proposal

At a glance

The existing Pier 2/3 and Wharf 4/5 are to be refurbished to include new performance spaces and commercial operations (bars, cafes, restaurants, etc.), as well as an enhanced public domain. It is proposed to remove all existing on-site car parking from both the pier aprons and the bridge across Hickson Road. A new loading facility is proposed on Pier 2/3 that would be amenable to the overall heritage status of the site. End of trip bicycle facilities are proposed to be provided as part of the development.

4.1 Land Uses

The various land uses proposed as part of the development are described in the Bates Smart Design Report and are summarised in Section 2.4 of this Report.

However, it is noted that an overall floor area of 16,500sq.m (approx.) is anticipated as part of the redevelopment.

4.2 Population Forecasts

4.2.1 Day to Day

Future population forecasts have been undertaken by REA Consulting, with a summary of the results provided in Table 1.

Period	Morning		Afternoon		Evening	
	Staff/ Performers	Visitors/ Audience	Staff/ Performers	Visitors/ Audience	Staff/ Performers	Visitors/ Audience
Weekday	387	290	116 [1]	605	296	1,795
Saturday	132	390	82 [1]	1,395	146	1,555

[1] Includes staff demands from the morning period.

Table 1: Summary of Daily Population Forecasts (Day to Day)

Table 1 indicates an overall daily attendance of 3,489 (incorporating 799 staff/performers and 2,690 visitors/audience) on a typical weekday and 3,700 (incorporating 360 staff/performers and 3,340 visitors/audience) on a typical Saturday.

It is noted that pedestrian, cyclist and vehicle counts undertaken in January 2013 indicate that the site currently attracts some 1,300 and 2,000 people across a typical weekday and Saturday, respectively. As such, the future forecast represents some 2,200 (+170%) and 1,700 (85%) additional people trips to the site.

The above forecasts exclude anticipated 'walkthrough' trips (i.e. people not attending a specific event/show/café at the site) that may be attracted to the site from The Rocks and Barangaroo precincts. Such visitation would typically be 'pass-by' trips from tourists already in the area, noting that such tourist activity would be strengthened by proposed increased arts and cultural offerings in the broader local area.

4.2.2 Event Mode

Population forecasts have been provided for the event mode and have been categorised into four different event types. A summary of the event populations, frequencies and example events are provided in Table 2.

Category	Population Forecast	Frequency	Example Events
Category 1 (Major Events)	Up to 10,000 people	Max 4 times per year	New Years Eve Australia Day
Category 2 (Arts and Cultural Festivals)	7,500 people at one time	Max 6 times per year	Sydney Writers Festival Vivid
Category 3 (Community Events)	Up to 5,000 people	No limit	Arts organisation open days Community Markets
Category 4 (Private Events)	Up to 1,000 people	No limit	Private functions Commercial Launches

Table 2: Summary of Event Mode Population Forecasts

4.3 Car Parking and Vehicle Access

It is not proposed to provide any staff or visitor car parking on-site. This is generally consistent with the current operation of the site, noting that some informal/ opportunistic staff car parking currently takes place on the aprons to the pier (and is currently being removed separately to the redevelopment proposal).

In order to facilitate loading movements to and from the site it is proposed to maintain the existing crossovers from Hickson Road.

4.4 Loading Facilities

A new loading facility is to be provided on Pier 2/3. In order 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 operation of this facility is further discussed in Section 9.

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

4.5 Bicycle Facilities

An on-site bicycle parking facility will be provided adjacent to the main entrance to the site. Additional on-street bicycle parking will be provided to complement the existing racks on Hickson Road.

Shower and change room facilities will be provided as part of each of the arts tenancies.

Further opportunities to integrate cycling and end-of-trip facilities would be explored as part of the detailed design process. Arts NSW would also discuss (with BDA) any potential opportunities for Walsh Bay to be incorporated into facilities (such as bike hire/ share) that may be proposed as part of the Barangaroo development in the future.

4.6 Transport Stakeholder Consultation

The project team met with TfNSW and City of Sydney (Transport Planning and Traffic Operations) on separate occasions, to better understand the likely future transport facilities in the area and status of current relevant projects, as well as outline the proposed redevelopment and associated transport strategies.

Feedback received has been incorporated into the assessment of traffic and transport impacts and proposed transport strategies.

5. Transport Demands

At a glance

Future mode shares to and from the site have been determined having regard for the accessibility of the site from the various modes and the anticipated clientele to the site, and has been benchmarked against the mode share targets for Barangaroo. Bus, train and walking trips are anticipated to make up the majority of visitor and staff trips to the site, with taxi, ferry, private vehicle and cycle trips making up the balance.

5.1 Preamble

In order to estimate the future travel demands, anticipated future mode shares have been developed which have regard for a number of factors, including:

- availability of car parking
- public transport accessibility
- walking and cycling networks
- anticipated clientele to the site
- benchmarking against the mode shares anticipated at the adjacent Barangaroo development

It is recommended that prior to the opening of the new precinct that a Green Travel Plan and Transport Access Guide be prepared for the site. The Green Travel Plan would identify opportunities (policy and physical infrastructure) to encourage the use of sustainable transport options to the site, whilst the Transport Access Guide would provide an outline of the transport options to the site for staff and visitors (see Section 7.5 for further discussion).

5.2 Benchmarking – Barangaroo Development

In order to provide a preliminary estimate of the likely mode share for future users of the site reference is made to the Barangaroo Integrated Transport Plan (BITP). The mode shares set out in the BITP relate to resident and employee trips, whilst trips to and from the Walsh Bay Arts Precinct will be predominantly visitor trips and as such, the BITP splits have been referenced as a guide only.

The mode share targets for Barangaroo indicate that the majority of users will utilise public transport (85%) to access the site, with the remaining modes, walking and cycling (10%) and private motor vehicle (5%) making up the remainder of trips. Given the site's proximity to the Barangaroo development and Sydney CBD, a high public transport mode share could also be expected. The nature of Arts Precinct visitations is such that a significant proportion of walking trips is expected.

5.3 Mode Share

Based on the above, the anticipated future mode shares for visitors to the site are provided in Figure 5. It is noted that the mode share estimates include staff and performers as well as audience and visitors to the site.

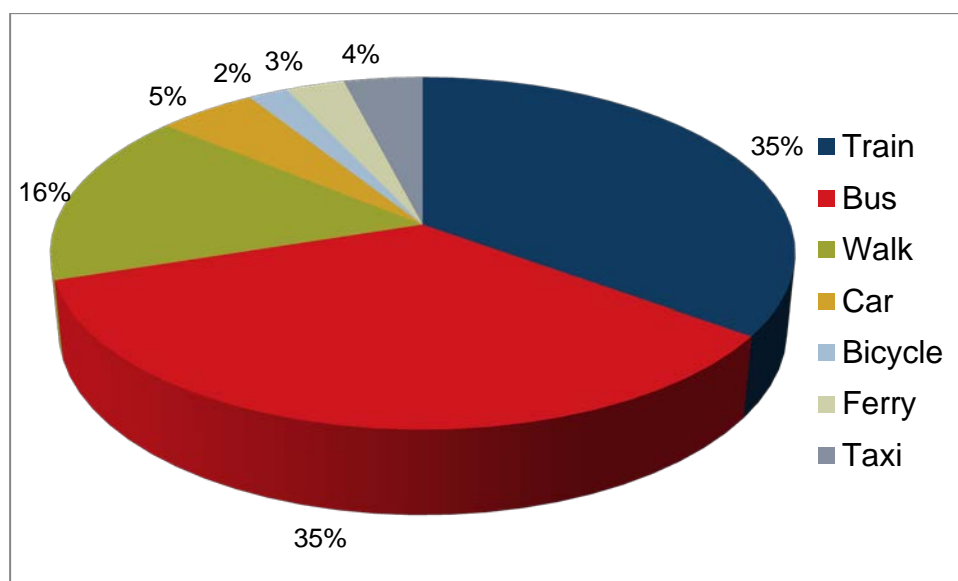


Figure 5: Anticipated Future Mode Share

5.4 Resultant Peak Hour Travel Demands

The resultant travel demands have been determined by applying the mode shares identified above to the existing visitor profiles for a weekday (Thursday) and Saturday (based on pedestrian, cyclists and vehicle counts commissioned by Savills).

The analysis indicates that the peak transport demands to/from the site will occur during the early evening, when the afternoon users of the site will be leaving overlapping with the evening users arriving. The weekday peak demands are anticipated to be more concentrated (as people arrive after work) than the Saturday demands which are more spread out.

The detailed results of this analysis are provided in Appendix 1, with the peak period demands summarised in Table 3. The below Table includes the existing demands to the site.

Period	Mode People to/from Site (Site Peak: 6:00 to 7:00pm)						
	Train	Bus	Walk	Car [1]	Bicycle	Ferry	Taxi
Weekday	446	446	230	108	27	41	54
Saturday	244	244	126	59	15	22	30

[1] Overall number of people accessing the site during a peak period, not strictly the number of vehicle movements.

Table 3: Future Peak Transport Demands (Day to Day Operation)

5.5 Car Parking Demands

The anticipated future car parking demands (existing + additional) to be generated by the site are presented in Table 4.

Day	Time Period	Overall Site Population	Mode Share to Car	Anticipated Car Occupancy	Resultant Car Parking Demand
Weekday	Morning	677	8%	2.0 people per car	27 spaces
	Afternoon	1,108			44 spaces
	Evening	2,091			84 spaces
Saturday	Morning	522			21 spaces
	Afternoon	1,609			64 spaces
	Evening	1,701			68 spaces

Table 4: Peak Car Parking Demands

Table 4 indicates that the site is expected to generate peak car parking demands of 84 and 64 spaces during the weekday and Saturday evening peak periods, respectively.

5.6 Event Mode

In addition to the day-to-day operation of the site, a number of special events (as detailed in Table 2), will be held within the precinct throughout the year. The Category 1 and 2 events will attract crowds greater than those for the day-to-day operation of the site.

Whilst it is understood that the State Significant Development Application primarily considers the future day-to-day operation of the site, an overview of the event mode transport demands are presented below. Notwithstanding, it is envisaged that a Transport Management Plan (TMP) would be prepared for the site during event mode. The TMP would identify preferred access routes to the site for pedestrians, buses and taxis, temporary taxi and bus zones and any temporary road closures (full or partial) that could be required as part of larger events. The TMP would also detail any special /shuttle bus arrangements that may be required to service the site during larger events.

The TMP would be prepared in consultation with relevant stakeholders, such as Transport for NSW, City of Sydney, NSW Police and others as required.

Patrons for events would be encouraged to access the site via public transport. As such, it is anticipated that the travel mode of visitors to the site will vary from the day-to-day operation, with an increased bias towards public transport use, away from private vehicle. In particular, it is envisaged that the majority of the increased public transport use would be train travel. The forecast transport modes for the event operation are presented in Table 5.

The transport demands have been assessed on the basis of one third of attendees arriving during the peak period (mid-morning for daytime events and early evening for night-time events) and are presented in Table 5.

Event type	Mode People to/from Site						
	Train	Bus	Walk	Car [1]	Bicycle	Ferry	Taxi
Mode Share	50%	25%	16%	2%	1%	3%	3%
Category 1	1667	833	533	67	33	100	100
Category 2	1250	625	400	50	25	75	75

Table 5: Future Peak Transport Demands (Event Operation)

Specific details of how the above transport demands would be managed will be provided in the TMP. However, it is noted that there are a number of existing events, including New Years Eve (Category 1) and Sydney Writer's Festival (Category 2), that currently take place at the venue. Event specific TMPs detail the transport management measures implemented for these events.

The existing transport network and associated TMPs are capable of accommodating the transport demands generated by these existing events (which will be future Category 1 and 2 events) and as such, the transport network will be capable of accommodating the future range of events (Category 1 to 4) subject to the preparation of appropriate event specific TMPs.

6. Car Parking and Vehicle Access

At a glance

Consistent with City of Sydney and TfNSW policy, no staff or visitor car parking is to be provided on-site. The Arts Precinct transport strategy is focussed on non-car modes, with residual car parking demands generated by the site to be accommodated within the surrounding publicly available car parking supply, including the new 300 space car park to be provided as part of the Headland Park at Barangaroo. Additional taxi and pick up / drop off facilities will be provided on Hickson Road.

6.1 Car Parking Requirements

The proposed development is to be located within Walsh Bay and is therefore under the management and control of the Sydney Harbour Foreshore Authority (SHFA). Given the site's proximity to the City of Sydney, GTA Consultants has referenced the City of Sydney's Local Environmental Plan (LEP) 2012 for the on-site car parking requirements.

The LEP car parking provision provides the following rate for the **maximum** number of car parking spaces for 'entertainment' uses:

"1 space for every 30 square metres of the gross floor area of the building used for those purposes"

Given that the City of Sydney applies a maximum (and no minimum) car parking rate the provision of no car parking meets the City of Sydney's requirements and is indeed consistent with many of the City's and TfNSW transport policies that promote sustainable transport.

6.2 Car Parking Impacts

Notwithstanding of the LEP requirements presented above (i.e. maximum car parking rates), it is acknowledged that the subject site is still anticipated to generate a level of car parking demand that will need to be accommodated off-site. In this regard reference to Section 5 of this Report indicates that the site is anticipated to generate the following peak car parking demands:

- Typical Weekday: up to 84 spaces
- Typical Saturday: up to 68 spaces

It is noted that these off-site car parking demands include existing car parking demands generated by the site.

The additional car parking demands will be accommodated within the surrounding publicly available car parking supply, including a combination of the following:

- surrounding on-street car parking supply
- surrounding off-street car parking stations (x2) to the immediate west of the site on Hickson Road
- future off-street car park to be provided as part of the Headland Park associated with the Barangaroo projects (approximately 300 spaces)

- off-street commuter car parking stations located at the northern end of the CBD that could cater for additional evening demands.

The existing on-street car parking restrictions are generally 4P during the evening and a combination of 2P and 4P restrictions during the day. The evening time restrictions are conducive to accommodating the parking demands of the site. The 2P parking areas would not be generally suitable for users of the site and would continue to provide a parking provision for other competing uses within the precinct.

Should car parking demands begin to consistently exceed supply it will ultimately result in a further mode shift away from private vehicle use for existing and future users of the site and broader precinct. It is noted that the on-street car parking supply is anticipated to decrease, further exacerbating car parking demands, as a result of the recommendations contained within the Harbour Village North Public Domain Study. This further aligns with the objectives of the City of Sydney to increase sustainable transport travel to the CBD.

Future car parking demands could in-turn be managed by varying the cost of on-street and off-street car parking spaces throughout the day, such that pricing matches demand.

6.3 Pick-up/ Drop-off Facilities

It is recommended that enhanced pick-up and drop-off facilities be provided in the immediate vicinity of the subject site to accommodate increased pick up and drop off demands to the site from private vehicle and taxi.

In this regard it is recommended that two additional pick-up/ drop-off and two additional taxi zone spaces be provided on Hickson Road. These spaces would replace existing 2P/4P spaces that are currently provided on Hickson Road.

The location of these spaces would need to be confirmed with the Central Sydney Traffic and Transport Committee. Initial correspondence with the City of Sydney indicates that general support for the proposed changes, subject to review as part of the SCCAS bus route implementation.

6.4 Vehicle Access

It is proposed to maintain each of the vehicle access points to the site from Hickson Road. The vehicle access points will provide access for loading vehicles to and from the site.

7. Sustainable Transport Infrastructure

At a glance

The majority of staff and visitors to the precinct will access the site via sustainable transport modes (public transport, walking and cycling). Additional bus capacity to and from the site will be provided along Hickson Road as part of a new key bus corridor to be delivered as part of the SCCAS. The existing pedestrian network will be capable of accommodating future demands to the site and will be further enhanced by the Harbour Village North project. End-of-trip facilities would be provided to accommodate cyclist demands.

7.1 Bicycle End-of-Trip Facilities

The NSW *Planning Guidelines for Walking and Cycling* (Department of Infrastructure, Planning and Natural Resources, 2004) aims to assist land use planners and related professionals to improve consideration of walking and cycling in their work. The guidelines have been designed to provide a walking and cycling focus to the NSW Government's *Integrating Land Use & Transport Planning* policy package. The *Planning Guidelines for Walking and Cycling* contain suggested bicycle parking provision rates for different land use types.

The redeveloped site is anticipated to accommodate an overall workforce of 500 staff and performers on-site at any one time and a seating capacity of 1,800 seats. Given this, the suggested bicycle parking provision for the development is summarised in Table 6.

Use	Suggested Parking Rate		Suggested Parking Provision	
	Staff	Visitors	Staff	Visitors
Cinema, Theatres	3-5% of staff	3-5% of seating capacity	15 to 25 spaces	54 to 90 spaces

Table 6: Suggested Bicycle Parking Rates

Adoption of the above rates indicates a future bicycle provision of 15 to 25 staff spaces and 54 to 90 visitor spaces.

The staff rate is considered to be representative of the future demands. However, the visitor rate is a generic rate for all cinemas and theatres and does not take into account the anticipated clientele for the site. In this regard reference is made to the transport demand assessment which indicated a combined staff and visitor mode share to bike of 2%, assuming a mode share of up to 5% for staff, a mode share of 1% for visitors is considered appropriate. Application of this rate indicates an overall bicycle parking provision of up to 20 spaces.

It is recommended that 25 secure bicycle parking spaces be provided on-site to cater for staff and performer demands, ideally with shower and locker facilities to service the broader precinct.

There are currently some 7 racks (capable of accommodating 14 bikes) provided in the immediate vicinity of the site at the Hickson Road / Pottinger Street intersection. It is recommended that up to 5 additional bicycle racks (capable of accommodating 10 bikes) be provided in the Hickson Road road reserve in the vicinity of the site to accommodate the visitor

bicycle parking demands, with opportunities for expansion identified should greater cycling numbers frequent the Precinct.

The number and location of additional racks would be provided in accordance with the relevant City of Sydney guidelines.

7.2 Pedestrian Network

As a result of the isolated nature of the site from the CBD and significant grade changes, the site is currently difficult to navigate to on 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-DDA compliant) as the path negotiates the significant grade difference between Hickson Road and the areas further inland. There may be an opportunity to maintain one of the grade separated crossings of Hickson Road as a pedestrian access to the site.

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 Railway 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.

Key pedestrian routes to and from the site are illustrated in Figure 6.

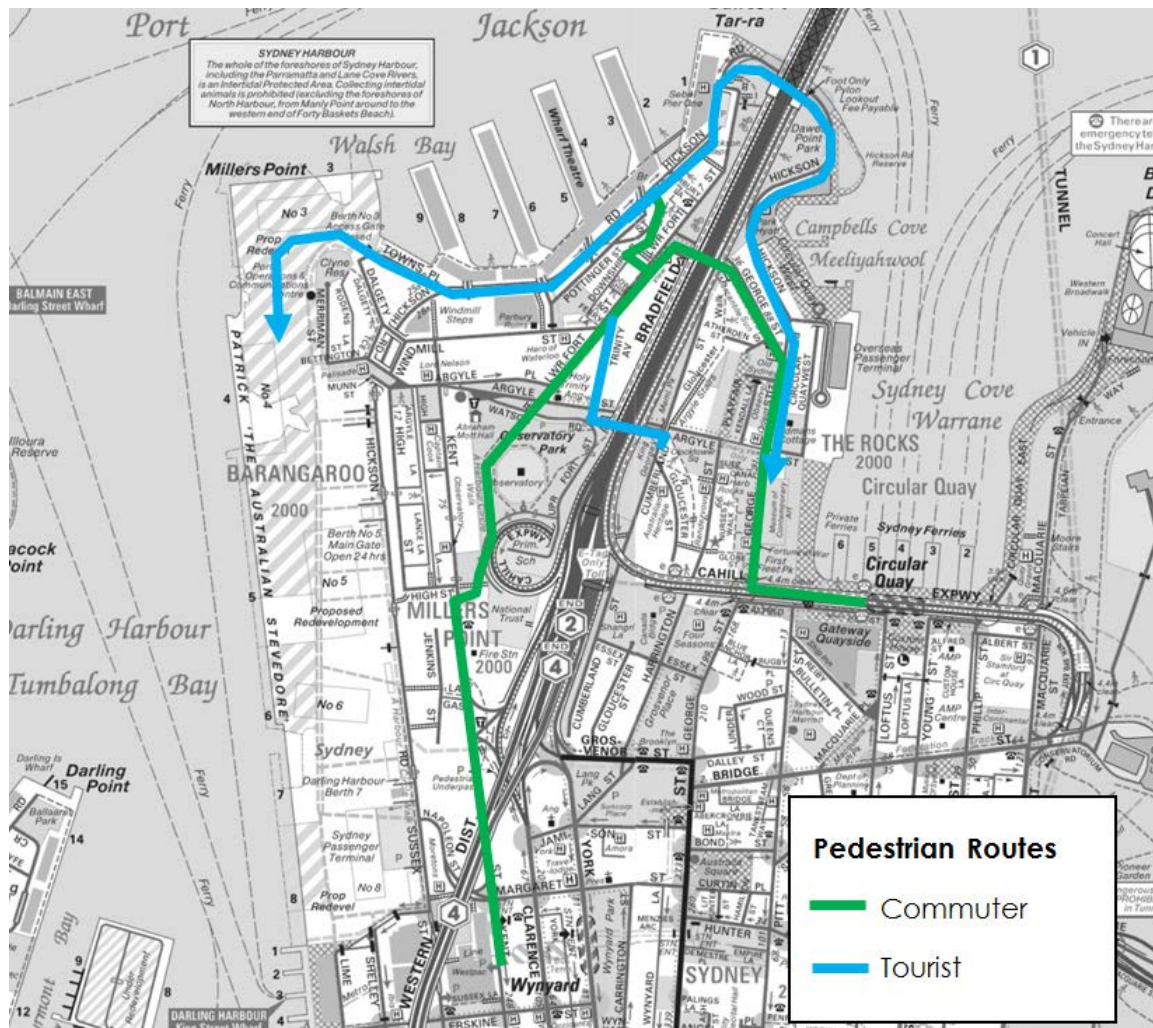


Figure 6: Key Pedestrian Routes to and from Walsh Bay

It is recommended that wayfinding signage be provided along the above key routes to and from the site, including tourist routes between The Rocks and Barangaroo and from the Harbour Bridge walkways and more direct routes between the key transport nodes. It is envisaged that signage at key transport nodes and along relevant routes would be integrated with other CBD wayfinding signage including finger boards, plinths and the like. Any focal point mapping prepared for the Sydney CBD should include the Walsh Bay Arts Precinct or another appropriate name that is recognisable to patrons.

Recent discussions with City of Sydney indicate that a CBD wayfinding strategy is currently being prepared by TfNSW as part of the SCCAS and that the Walsh Bay Arts Precinct should be incorporated into the strategy accordingly.

7.3 Public Transport

7.3.1 Rail Services

The transport demand assessment indicates an anticipated peak hour rail demand of 450 and 250 patrons during the weekday and Saturday evening peak hours.

It is anticipated that there would be adequate capacity within the existing rail network (Wynyard and Circular Quay Railway Stations) to accommodate these additional evening peak

hour demands. Patrons arriving by train are then assumed to walk to the precinct. Any patrons assumed to catch a train and then a bus from Wynyard (or Town Hall) have been captured in the bus forecasts below.

7.3.2 Bus Services

The transport demand assessment indicates an anticipated peak hour bus demand of 450 and 250 patrons during the weekday and Saturday evening peak hours. As detailed earlier, Hickson Road adjacent to the site has been identified in the SCCAS as a future high frequency bus corridor that will service the Barangaroo and Walsh Bay precincts. Initial advice from TfNSW indicates future bus frequencies of 5 to 10 minutes along Hickson Road or 6 to 12 buses per hour.

The bus routes along Hickson Road will primarily service Barangaroo and during the PM peak periods are anticipated to carry peak loads from Barangaroo towards the city. As such, during the PM peak it is anticipated that there would be significant capacity to accommodate visitors travelling towards Walsh Bay as these services will be “contra peak”.

Assuming a capacity of 60 people per bus, the bus services along Hickson Road will have a future capacity between 360 and 720 patrons per hour. Given Walsh Bay will be used as a route terminus and layover, there is likely to be significant future bus service frequency/capacity that would not otherwise be available for patronage-based service provision.

The ability of the future bus network to accommodate the anticipated bus patronage demands is dependent on the future frequencies of buses along Hickson Road. Additional bus capacity may be required during peak periods. However, the extent of the additional capacity will not be known until the frequency of buses along Hickson Road is confirmed. It is anticipated that bus network operators would respond appropriately to regular daily demand generated by both Barangaroo and Walsh Bay.

For larger events, site-specific shuttle buses are likely to be required to transfer patrons from high frequency bus and rail connections at Wynyard and/or Circular Quay and/or CBD parking stations to the site.

7.3.3 Ferry

The transport demand assessment indicates relative low peak hour ferry demand to and from the site (<50). This level of activity could be accommodated within the existing services to Circular Quay and future services to the proposed Barangaroo Ferry Hub.

There are also opportunities for chartered boats/ ferries to use the existing berth located at Pier 2/3 to transport patrons to the precinct, enhancing the visitor experience. Typical private ferry transfers would accommodate in the order of 150 passengers. Given the short travel time from Circular Quay, two ferries providing a shuttle service could potentially transfer 500 to 750 patrons per hour. Such arrangements would be most suitable for large events with a specific start time. Further discussions with ferry operators would be required to establish whether this would be cost effective.

The provision of increased water access would reduce the anticipated demands on other transport modes, with potential road network congestion benefits during (particularly during events).

7.4 Taxi

It is anticipated that the demand for taxi and hire car services to and from the precinct will increase as a result of the redevelopment. In this regard, it is recommended that an improved and expanded taxi rank facility (+2 spaces) be provided on Hickson Road abutting the site.

In the short term, these facilities would be provided through changes to existing parking restriction signage. In the longer term, high-quality facilities could be incorporated into the streetscape design recommended by the Harbour Village North Public Domain Study (City of Sydney, 2012).

The location of any additional taxi spaces would need to be initially confirmed with City of Sydney and SHFA and subsequently referred to the Central Sydney Traffic and Transport Committee once the preferred location has been confirmed.

7.5 Green Travel Plan

Travel plans are designed to reduce the reliance on private car travel by boosting and encouraging the use of active and sustainable transport modes.

Large organisations use travel planning as an effective tool to meet a range of different travel-related goals. Examples include initiatives to reduce traffic congestion and/ or parking demand (both on and off-street), reduce absenteeism, improve staff retention, increase physical activity, improve air quality and to improve morale.

Each site has unique characteristics so the objectives, programs, initiatives and measures contained in the travel plan must be tailored and site specific. Successful travel plans are iterative processes supported by senior management and generally delivered by a staff member (or team). It is recommended that a green travel plan be prepared for the proposed development to private vehicle usage and encourage the use of active and sustainable transport modes.

The Green Travel Plan would include:

- a 'reach' transport goal / target to reduce private vehicle travel demand
- infrastructure to support walking, cycling, motorcycling and public transport access to the site
- programs to reduce drive-alone travel behaviour by staff, visitors and audiences
- tenant policies to reduce drive-alone travel demand at the subject site
- staff travel coordinator responsibilities
- monitoring tools and an evaluation program to document performance
- preparation of a Transport Access Guide to detail sustainable transport options for visitors to the site.

8. Traffic Impact Assessment

At a glance

The ability for the site to generate traffic is limited through not providing on-site car parking. As a result the site is anticipated to generate up to 120 vehicle movements during the site peak hour (2 vehicles per minute), which will not coincide with the road network peak hour.

8.1 Preamble

One of the objectives of the City of Sydney LEP 2012 is “to minimise the amount of vehicular traffic generated because of proposed development”. This is (in part) achieved by limiting on-site car parking provisions by applying maximum rather than minimum car parking rates on development. Indeed, in this instance no car parking is to be provided on-site drastically reducing the ability for the site to generate traffic movements to and from it.

8.2 Traffic Generation

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

Utilising the travel demand estimates presented earlier in this Report, Table 7 presents a summary of the anticipated peak hour traffic generation to and from the site (6:00 to 7:00pm).

Mode	Persons Arriving by Mode in Peak Hour	Vehicle Occupancy	Peak hour Vehicle Trips to the Precinct
Taxi	54	2	54 (includes taxi trip to and from the site)
Private Vehicle (including pick up / drop off)	108	2	54 (one trip to the precinct)
Loading Vehicle	-	-	<10
Total			118

Table 7: Summary of Weekday Peak Hour Traffic Generation (6:00 to 7:00pm)

Table 7 indicates that the site is anticipated to generate some 118 vehicles during the site peak hour. The additional traffic equates to two additional vehicle movements every minute.

8.3 Traffic Impact

A number of road and intersection upgrades are to be undertaken in the vicinity of the site as part of the Barangaroo development (Hickson Road Integration Works). These upgrades are

designed to accommodate the additional traffic generated by Barangaroo into the broader road network.

The Barangaroo development consists of predominantly residential and commercial land uses, as well as some supporting entertainment and tourism uses. It is envisaged that the peak traffic generation from the site will occur during the road network peak hours (i.e. 8:00 to 9:00am and 5:00 to 6:00pm). Given that Hickson Road does not provide access to any uses north of the site, only limited traffic from Barangaroo is expected to travel along Hickson Road in the vicinity of the site.

The peak traffic generation from the Walsh Bay Arts Precinct is anticipated to occur during the early evening (i.e. after 6:00pm) and as such, is not anticipated to coincide with the road network or Barangaroo peak traffic generating periods.

Given that the surrounding road network has been designed to accommodate the future traffic generation of the Barangaroo development during the road network peak hour, it is anticipated that the same network will be more than capable of accommodating the traffic generation from the subject site outside of the road network peak hour. It is further noted that the overall traffic generation from the site will be negligible when compared to the overall traffic generated by the Barangaroo site.

Another traffic generating use in the vicinity of the site is the Overseas Passenger Terminal (OPT) located at Circular Quay. The terminal generally operates between October and April, with cruise ships generally arriving between 6:00 and 8:00am and departing between 4:00 and 6:30pm. Whilst docked, these ships are serviced by loading vehicles from the Sydney Ports Marine Base located on Towns Place. These vehicles travel along Hickson Road to access the OPT. Advice from the Sydney Ports Marine Base indicates that in the order of 6-10 vehicles per hour (semi-trailers) are generated whilst ships are docked during the cruise ship season.

Traffic generation from the OPT is typically concentrated between 7:00am and 5:30pm whilst the ships are still docked and being serviced. It is not anticipated that the traffic generation from the site (average 2 vehicles every minute during peak periods) would impact on vehicles servicing the OPT.

Furthermore, on-site observations indicate that the existing Hickson Road / Pottinger Street intersection currently operates satisfactorily and would be capable of accommodating the additional day-to-day traffic generation anticipated to be generated by the site.

During event mode, the traffic demands would be managed accordingly via a Traffic Management Plan.

9. Loading Facilities

At a glance

A new loading facility will be provide on Pier 2/3 which will complement the existing loading facility on Wharf 4/5 and the on-street loading provisions. The loading facility will be able to accommodate vehicles up to MRV (8.8m) entering and exiting the site in a forward direction.

9.1 Loading Requirements

The City of Sydney provided the most relevant comparison for requirements for loading for the proposed development. 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 8.

Use	Size (GFA)	Loading Rate	Loading Requirement
Commercial	16,500sq.m	1 space per 3,300sqm GFA, or part thereof	5
Total			

Table 8: Loading Requirements

Based on the above, the proposed development could provide up to 5 loading spaces under the City of Sydney's DCP, noting that the site is not under the planning controls of the City of Sydney.

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 and the existing loading dock on Wharf 4/5 and the on-street loading provisions that 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.

9.2 Swept Path Assessments

GTA has undertaken a review of 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 bay that rises from the apron is to be engineered on the east side of Pier 2/3. The arrangement would require the loading vehicle to pass over the loading bay and prop forward of it. The loading dock would then rise from the apron of the pier, where the loading vehicle would be able to be loaded/unloaded. The loading vehicle would then travel to the northern end of the pier where it would turnaround and then travel back along the pier to Hickson Road.

The existing apron is generally 5.8m wide and whilst not strictly in accordance with AS2890.2-2002 (which requires 6.2m for two MRV vehicles to pass), would allow two SRV loading vehicles to physically pass. 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 4m wide, with vehicles not able to pass at this location. The width of the apron precludes two MRV's being able to pass each other (or a SRV and a 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 (6.4m) is able to turnaround at the end of Pier 2/3 with a 2-point turn
- A MRV (8.8m) is able to turnaround at the end of Pier 2/3 with a 4-point turn

The swept path assessments are provided as Appendix 2.

10. Conclusions and Recommendations

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

- The redevelopment of the Walsh Bay Arts Precinct (Pier 2/3 and Wharf 4/5) will increase the average patronage to the site from 1,300 to 3,500 and from 2,000 to 3,700 for weekdays and Saturdays respectively (inclusive of staff and performers demands).
- The majority of movements to the site will be public transport (bus and train) and walking trips.
- Bus frequencies of 5 to 10 minutes (6 to 12 buses per hour) will be provided on Hickson Road. The ability of the future bus network to accommodate the anticipated bus patronage demands is dependent on the future frequencies of buses along Hickson Road. Notwithstanding, it is anticipated that bus network operators would respond appropriately to regular daily demand generated by both Barangaroo and Walsh Bay.
- There is adequate capacity to cater for the future train and ferry demands.
- The existing pedestrian network will be capable of accommodating the additional pedestrian demands. Furthermore, pedestrian facilities and amenity will be improved as part of the proposed Harbour Village North project.
- End-of-trip bicycle parking facilities will be provided to cater for future staff/performer and visitor demands.
- Consistent with City of Sydney and TfNSW policy, no on-site car parking is proposed to be provided on-site. Car parking demands generated by the redeveloped site will be accommodated within the surrounding car parking supply, including the new 300 space public car park to be provided as part of the Headland Park at Barangaroo.
- Enhanced pick-up/ drop-off and taxi facilities could be provided within the existing road space on Hickson Road.
- The site is anticipated to generate up to 120 vehicle movements in a peak hour. The site peak hour will occur in the early evening outside of the afternoon road network peak hour.
- The existing transport network is capable of accommodating existing travel demands generated by the Precinct (up to Category 1 events) and as such, would be capable of accommodating the transport demands generated by future events (ranging from Category 1 to 4). Event specific TMP's would be prepared to detail the transport management measures to be implemented for the Category 1 to 4 events as appropriate.
- A loading facility will be provided on Pier 2/3 and will complement the existing loading facility on Wharf 4/5 and the on-street loading areas. A MRV (8.8m) will be able to enter and exit the site in a forward direction.

11. References

In preparing this report, a number of references have been made, including:

- 'Walsh Bay Arts Precinct – Preliminary Draft Concept Design Report for Arts NSW', prepared by Bates Smart, dated 22 November 2013
- 'Population Analysis', prepared by REA Consulting, dated 24 February 2014
- 'Barangaroo Integrated Transport Plan' prepared by the NSW Government (released 30 August 2012)
- 'Walsh Bay Arts Precinct: Traffic Counts' prepared by Savills, dated April 2013
- 'Sydney City Centre Access Strategy: For Further Consultation' prepared by the NSW Government, dated September 2013
- 'Sydney's Ferry Future' prepared by the NSW Government, dated May 2013
- 'Harbour Village North Public Domain Study', City of Sydney, dated May 2012
- 'NSW Planning Guidelines for Walking and Cycling' prepared by the NSW Department of Planning Infrastructure and Natural Resources (DIPNR) in 2004
- 'Sydney's Cycling Future' prepared by TfNSW released in December 2013
- Australian Standard / New Zealand Standard, Parking Facilities (AS2890)
- an inspection of the site and its surrounds
- other documents as nominated.

Appendix 1

Travel Demand Summary Table

Appendix 2

Swept Path Assessment