POWERHOUSE PARRAMATTA
RESPONSE TO SUBMISSIONS REPORT

APPENDIX K
REVISED TRANSPORT ASSESSMENT

JMT Consultants

NSW GOVERNMENT

Powerhouse Parramatta

Transport Impact Assessment

Prepared for:

Infrastructure NSW

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JMT Consulting

Document History

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1 Introduction

1.1 Overview

This report supports a State Significant Development (SSD) Development Application (DA) for the development of the Powerhouse Parramatta at 34-54 & 30B Phillip Street and 338 Church Street, Parramatta. The Powerhouse Parramatta is a museum (information and education facility) that has a capital investment value in excess of $30 million and as such the DA is submitted to the Minister for Planning pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

Infrastructure NSW is the proponent of the DA.

1.2 Background

The Powerhouse is Australia's contemporary museum for excellence and innovation in applied arts and sciences. The museum was established in 1879 in the Garden Palace which emerged from a history of 19th Century grand exhibition halls, including the Grand Palais. It currently encompasses the Powerhouse in Ultimo, Sydney Observatory in The Rocks and the Museums Discovery Centre in Castle Hill. The Powerhouse has occupied the Ultimo site since 1988.

Parramatta, in the heart of Western Sydney, is entering a period of rapid growth. It was identified in 2014's A Plan for Growing Sydney as the metropolis' emerging second Central Business District, with the provision of supporting social and cultural infrastructure regarded as integral to its success. The strategic importance of Parramatta as an economic and social capital for Sydney has been subsequently reinforced and further emphasised through its designation as the metropolitan centre of the Central City under the Greater Sydney Region Plan.

Powerhouse Parramatta will be the first State cultural institution to be located in Western Sydney – the geographical heart of Sydney. In December 2019, the Government announced the winning design, by Moreau Kusunoki and Genton, for the Powerhouse Parramatta from an international design competition.

Powerhouse Parramatta will establish a new paradigm for museums through the creation of an institution that is innately flexible. It will become a national and international destination renowned for its distinctive programs driven by original research and inspired by its expansive collections. It will be a place of collaboration, a mirror of its communities forever embedded in the contemporary identity of Greater Sydney and NSW.

1.3 Site description

The site is located at the northern edge of the Parramatta CBD on the southern bank of the Parramatta River. It occupies an area of approximately 2.5 hectares and has extensive frontages to Phillip Street, Wilde Avenue and the Parramatta River. A small portion of the site extends along the foreshore of the Parramatta River to the west, close to the Lennox Street Bridge on Church Street. The site boundary is identified in Figure 1 and Figure 2. The site excludes the GE Office Building at 32 Phillip Street.

The site is currently occupied by a number of buildings and structures, including:

- Riverbank Car Park – a four-level public car park
- Willow Grove – a two-storey villa of Victorian Italianate style constructed in the 1870s, which is a locally-listed heritage item (I737)
- St George's Terrace – a two-storey terrace of seven houses fronting Phillip Street constructed in the 1880s
- 36 Phillip Street – a two-storey building comprising retail and business premises
- 40 Phillip Street – a two-storey building comprising retail and business premises
- 42 Philips Street – a two-storey substation building set back from the street comprising retail premises

The immediate context of the site comprises a range of land uses including office premises, retail premises, hotel, serviced apartments and residential apartments. To the north is the Parramatta River and open space corridor, beyond which are predominately residential uses. The Riverside Theatre is located to the north-west across the Parramatta River.

Figure 1 Aerial photograph of the site and its context

Source: Mark Merton Photography

Figure 2 Site boundary, key existing features, and immediate local context

Source: Ethos Urban

1.4 Secretary's Environmental Assessment Requirements (SEARs)

The Department of Planning, Industry and Environment (DPIE) issued a list of the Secretary's Environmental Assessment Requirements (SEARs) which inform the Environmental Impact Statement (EIS). Table 1 lists the SEARs that are specific to transport and accessibility.

Table 1 Response to SEARs

SEARs – Transport and Accessibility	Section Discussed
Operation: *The EIS shall include a Traffic and Transport Impact Assessment that includes the following*	
accurate details of the current and likely estimated future daily and peak hour vehicle, public transport network, point to point transport, taxis, pedestrian and bicycle movements to/ from the site	3, 5.1
traffic modelling and analysis of the future daily and peak hour vehicle, public transport, pedestrian and bicycle movements likely to be generated by the proposed development and assessment of the impacts on the local road network, including key intersection capacity and any potential need for upgrading or road works (if required)	5.2
traffic modelling and analysis of precinct events, and assessment of pedestrian, bicycle and vehicle facilities and their ability to accommodate event movement through the precinct as well as to and from the development	5.2.4
an assessment of the need for any road network improvements that may be required to support the development	5.12
an assessment of the operation of existing and future transport networks including rail, bus, ferries, Parramatta Light Rail, Sydney Metro West, pedestrian and bicycle networks and point-to-point transport and coach facilities and their ability to accommodate the forecast number of trips to and from the development	3, 5
details of existing and proposed vehicular access arrangements, parking and servicing including compliance with the requirements of the relevant Australian Standards (i.e. turn paths, sight distance requirements, aisle widths, etc.) and an assessment of any potential impacts, considering various design and staging options and impacts for the development of the site	3.5, 5.6, 5.7,
details of the proposed vehicle, motorcycle, taxi, bus and coach parking, including justification for the level of parking on the site	5.8, 5.9, 5.11

SEARs – Transport and Accessibility	Section Discussed
details of the provision and access to bicycle parking facilities (and end of trip facilities) in secure, convenient, accessible areas close to main entrances incorporating lighting and passive surveillance	5.4
details of emergency vehicle access arrangements and a response to flood evacuation (up to and including the probable maximum flood) for pedestrians, cyclists and vehicles	5.10
details of any road and pedestrian safety measures required adjacent to the proposed development	5.12
initiatives and strategies to encourage employees, guests and visitors to make sustainable travel choices, such as walking, cycling and public transport that support the achievement of State Plan targets	6
Construction: *The EIS shall include a Construction Pedestrian and Traffic Management Plan addressing*	
details of the peak hour and daily construction and servicing vehicle	7.2.7
movements and access arrangements for workers to/from the site, emergency vehicles and service vehicle movements	7.2
cumulative impacts associated with other construction activities in the area, including impacts associated with the potential overlap with construction of the Parramatta Light Rail and any other State, Local and private development and capital works projects	7.3.7
assessment of traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrians, cyclists and public transport operations	7.3.1
road safety at key intersections and locations subject to heavy vehicle movements and high pedestrian activity	7.3.5
details of temporary cycling and pedestrian access during construction	7.3.1

This report also addresses the following Strategic Policy and Technical Guidelines:

Table 2 Policies and guidelines

Policy or Guideline	Section Discussed
Parramatta Ways Walking Strategy	2.1
Parramatta CBD Pedestrian Strategy 2017	2.1
Parramatta Bike Plan 2017	2.1
Guide to Traffic Generating Developments (Roads and Maritime Services) Guide to Traffic Management – Part 12: Traffic Impacts of Development (AUSTROADS)	2.3
NSW Planning Guidelines for Walking and Cycling Sydney's Rail Future Sydney's Bus Future Sydney's Ferry Future	2.2

1.5 Report purpose and structure

The purpose of this Transport Impact Assessment is to outline a strategy for access to the Powerhouse Parramatta. It supports the State Significant Development Application for the project by describing existing transport conditions and assessing the potential impacts of the proposal – both during construction and operation. This report has been structured into the following chapters:

- Chapter 1 provides an introduction an overview of the project
- Chapter 2 provides an overview of the relevant policy context and technical guidelines that have informed this assessment
- Chapter 3 details the transport environment around the existing site
- Chapter 4 provides a description of the proposal
- Chapter 5 provides an operational transport assessment of the future Powerhouse Parramatta
- Chapter 6 outlines the strategies and monitoring mechanisms to reduce the private vehicle impacts arising from the proposed development
- Chapter 7 includes an assessment of traffic and transport impacts from the demolition and construction phase of the project
- Chapter 8 summarises the key findings of the transport assessment

2 Policy Context

2.1 Relevant City of Parramatta Council documents

2.1.1 Parramatta CBD Pedestrian Strategy

The Parramatta CBD Pedestrian Strategy was prepared in May 2017 by the City of Parramatta Council to provide a clear direction for improvements in policy, infrastructure and travel behaviour relating to pedestrian activity within the Parramatta CBD.

The pedestrian strategy identifies the Powerhouse Parramatta site as an opportunity to further develop and improve pedestrian connectivity through the CBD. Specifically, it notes that the development of the Powerhouse Parramatta site will facilitate the completion of the Civic Link - a pedestrian link connecting the train station and Parramatta Square to the River and linking to lanes and arcades. The public domain of the Powerhouse Parramatta site has been designed to align with Council's vision of Civic Link and enable pedestrian movement between the site and Parramatta train station.

2.1.2 Parramatta Ways Walking Strategy

The Parramatta Ways Walking Strategy was finalised in May 2017 and provides a strategy to improve walkability across Parramatta. Parramatta Ways will deliver the NSW Government's vision for the Green Grid, becoming Australia's largest interconnected open space, bushland, and urban walking network.

Whilst the focus of the project is on streets outside of the CBD, the strategy identifies a number of enhanced walking links (see Figure 3) connecting to the Parramatta CBD. The shared path along the Parramatta River, adjacent to the Powerhouse Parramatta, will provide walking connections to a number of centres and neighbourhood shops within the Parramatta LGA.

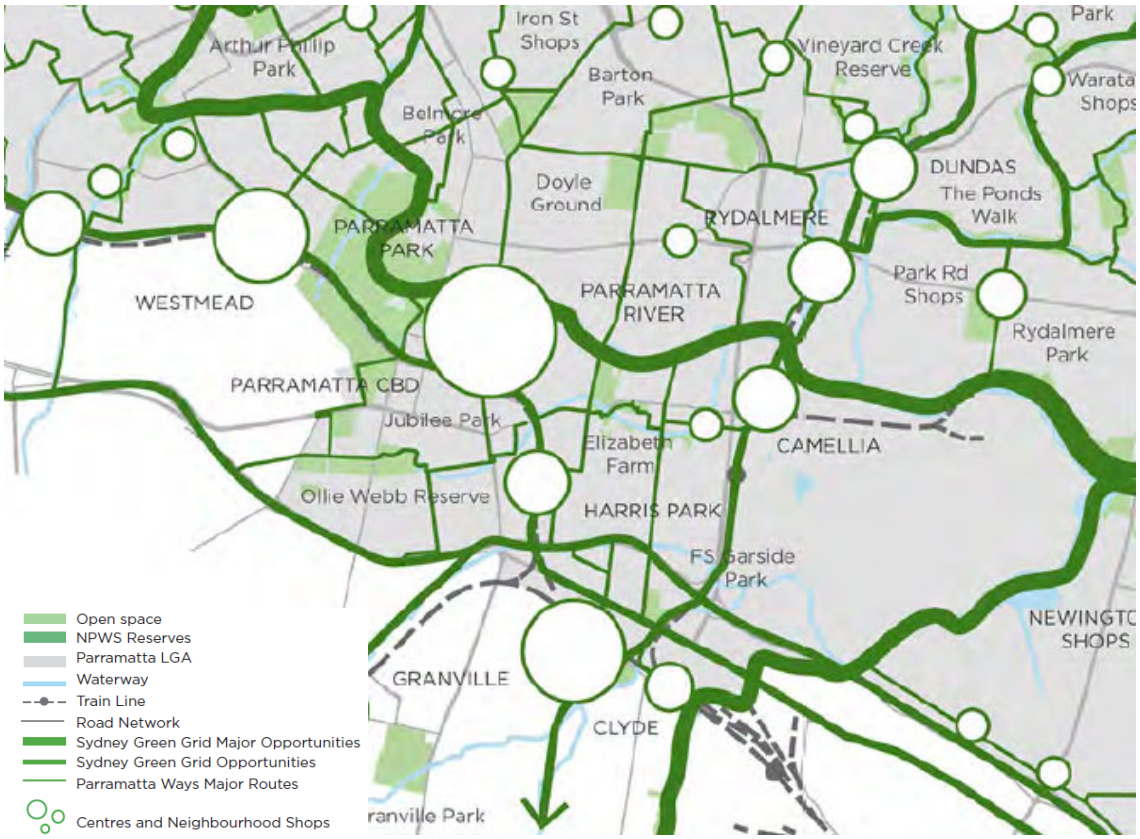


Figure 3 Parramatta Ways major routes map

Source: Parramatta Ways Walking Strategy, 2017

2.1.3 Parramatta Bike Plan

The Parramatta Bike Plan (May 2017) which provides a framework for the future roll out of the local and regional bicycle network within the Parramatta LGA for the next 20 years. The plan identifies a network of preferred bicycle routes, as illustrated in Figure 4.

Of relevance to the Powerhouse Parramatta site, the bike plan emphasises the importance of the Parramatta Valley Cycleway in connecting the Parramatta CBD to other parts of the LGA. The plan proposes a strengthening of the Parramatta Valley Cycleway to both the east and west of the site, which will enhance accessibility for staff and visitors travelling by bicycle to the Powerhouse Parramatta at Parramatta.

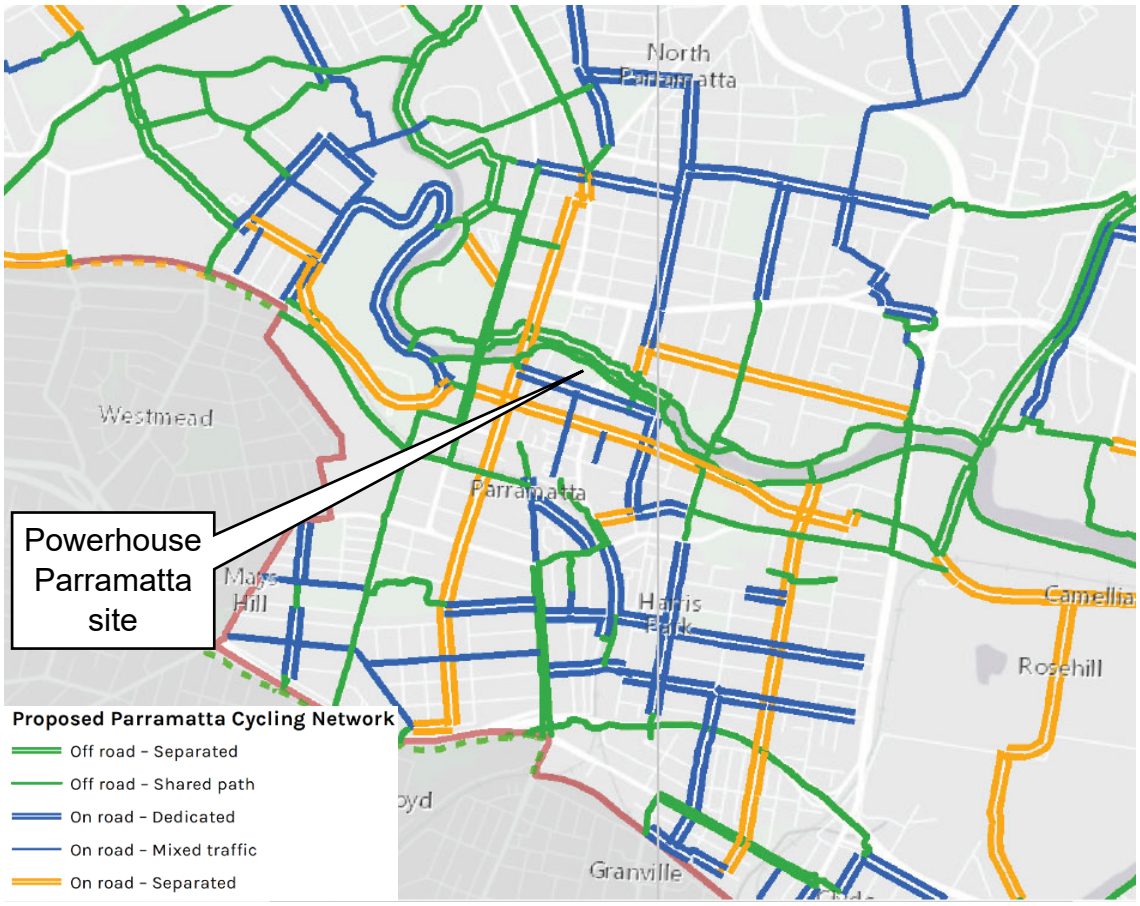


Figure 4 Proposed Parramatta cycling network

Source: Parramatta Bike Plan, 2017

2.2 Transport for NSW strategies

2.2.1 Future Transport 2056

Future Transport 2056 is NSW's long-term transport framework that provides the 40 year vision, directions and outcomes framework for customer mobility in NSW. It was developed in conjunction with the Greater Sydney Region Plan and the State Infrastructure Strategy. The vision for Greater Sydney is one where people can access jobs and services in their nearest metropolitan city and strategic centre within 30 minutes by public transport, 7 days a week.

The network requirements required to achieve the 30-minute city are further developed for Sydney in the Greater Sydney Services and Infrastructure Plan. The network vision includes north-south and east-west mass transit in the longer-term (city shaping corridors) and with supporting services (city serving corridors) for investigation – both which will directly improve public transport services to Parramatta.

Figure 5 2056 City-serving network

Source: Transport for NSW

2.2.2 Sydney's Rail Future

Sydney's rail network was released in June 2012 and provides the strategic framework to transform a 150 year old rail network, as well as a staged plan to achieve that strategy. Sydney's rail network will be modernised in five stages. The document is now eight years old however and is not relevant to the Powerhouse Parramatta project.

2.2.3 Sydney's Bus Future

Sydney's Bus Future (Transport for NSW, 2013) provides the framework for improving and delivering more frequent and reliable bus services throughout Sydney. The core aim of the strategy is to provide an integrated bus network with seamless connections to other transport services. The strategy also aims to tailor bus services to customer needs. In this vein, bus services will be focused into three key types, with associated priority and infrastructure investment:

- Rapid routes, which will use priority infrastructure, connect regionally throughout the city and have stops every 800m-1km
- Suburban routes, which will have stops every 400m and have mix of frequent 'turn up and go' and timetabled services
- Local routes, which will complete the network using local streets.

Visitors and staff to the Powerhouse Parramatta will take advantage of these improved connections.

2.2.4 Sydney's Ferry Future

Sydney's Ferry Future (Transport for NSW, 2013) identifies that Sydney's ferry services will play an expanded role in our integrated transport system, enhancing Sydney's attractiveness as a place to live and visit. New services will be introduced to meet customer needs and demand.

Key points to emerge from the strategy that are relevant to the site include:

- The future is about re-designing ferry services to respond to customer demand and forecast growth.

The Parramatta Ferry Wharf is located within close walking distance of the Powerhouse Parramatta site, with future visitors able to take advantage of the enhanced ferry services envisaged in this document.

2.3 NSW Government technical guidelines

The following documents have been considered in this transport strategy for the Powerhouse Parramatta:

- ***RMS Guide to Traffic Generating Developments***

  Used to inform the traffic assessment undertaken for the project including framework for undertaking the transport impact assessment.

- ***NSW Planning Guidelines for Walking and Cycling***

  This document has been used to inform the development of the walking and cycling measures proposed in this strategy as well as appropriate rates for bicycle parking.

- ***Guide to Traffic Management – Part 12: Traffic Impacts of Developments*** (AUSTROADS)

  This guide has been referenced for the appropriate methodology to be used for traffic impact assessment of the development.

3 Existing Conditions

3.1 Current travel patterns

3.1.1 Visitors

JMT Consulting undertook interview surveys at the existing Powerhouse Museum in Ultimo to understand the existing travel behaviours of people attending the museum. Surveys were undertaken between 10am-5pm over a typical weekday (Thursday) and weekend (Sunday) in February 2020. People were interviewed as they approached the museum entry points on Harris Street and Macarthur Street and asked their mode of arrival. More than 500 responses were gathered across the two survey days.

The findings of the survey are presented in Figure 6. This indicated that public transport is the most popular form of access to the museum, accounting for over half of trips on a weekday and nearly 40% of trips on a weekend. The proportion of people driving to the site is 26% on a weekday and 37% on a weekend – with this increase likely attributable to the higher number of local/domestic visitors and families that visit on a weekend when compared to a weekday. A significant number of trips (approximately 20%) are made by walking only and combined with visits to other sites in the Sydney CBD.

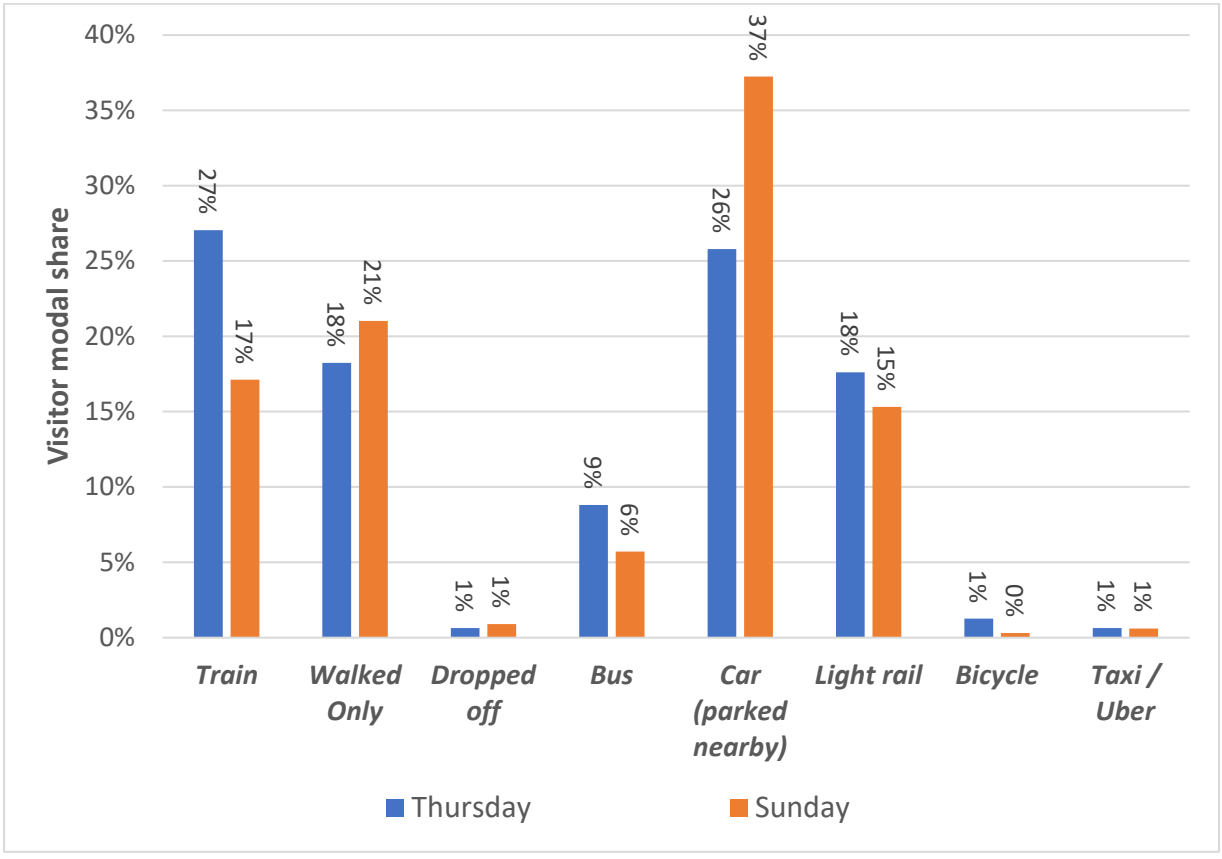


Figure 6 Existing travel behaviour to Powerhouse Museum at Ultimo

Visitors arriving by car and parking nearby to the site were asked to nominate the number of people that were in their car. The results of this survey question are summarised in Table 3, and indicate relatively high car occupancy rates of 2.4 and 3.2 for weekdays and weekends respectively.

Table 3 Existing car occupancy for trips to the Powerhouse Museum (Ultimo)

Number of people in the car	*Percentage of total responses*	
	Weekday	Weekend
1	7%	3%
2	49%	22%
3	39%	34%
4	5%	28%
5	0%	10%
6 or more	0%	3%
Average car occupancy	***2.4***	**3.2**

3.1.2 Staff

2016 Journey to Work (JTW) Census data has been analysed to understand travel patterns of workers of the Parramatta CBD. This indicates public transport accounts for approximately half of all work related trips, reflecting the strong accessibility of the area.

Table 4 Existing journey to work mode share of workers of Parramatta CBD

Mode of Travel	Mode Share
Car Driver	40%
Car Passenger	2%
Train	41%
Bus	11%
Walk Only	4%
Other (Bicycle / Ferry / Motorcycle)	1%
Total	**100%**

3.2 Public transport network

3.2.1 Rail network

The site of the Powerhouse Parramatta is serviced by Parramatta Station, located within 10 minutes (~700m). Parramatta station provides frequent, high capacity rail services on the T1 North Shore, Northern & Western Line, Blue Mountains Line and the T5 Cumberland Line (see Figure 7). More than 75 train services arrive / depart Parramatta Station in the morning peak hour, providing people access across the broader rail network.

Figure 7 Existing Sydney Trains network

3.2.2 Bus network

The closest bus stops to the site are located on Smith Street south of Phillip Street, approximately 150m from the site. Smith Street is a strategic bus corridor which takes all bus services from the north of Parramatta into the Transport Interchange and will become more significant with the introduction of the Parramatta Light Rail.

Around 18 bus routes, including up to 85 buses per hour during peak periods, travel to and from the Parramatta Transport Interchange via Smith Street and Wilde Avenue. These existing bus routes are detailed in Table 5 below.

Table 5 Bus routes servicing Smith Street

Bus Route	Destination
520	City Circular Quay via West Ryde
521	Eastwood Station
523	West Ryde
524	Ryde-Church Street via West Ryde
525	Burwood via Sydney Olympic Park
546	Epping via Oatlands and North Rocks
549	Epping via North Rocks
550	Chatswood via Macquarie Park
552	Oatlands
600	Castle Hill
601	Rouse Hill Town Centre
603	Rouse Hill Town Centre via Glenhaven
604	Castle Hill via Winston Hills
606	Winston Hills
609	North Parramatta (loop)
625	Pennant Hills Station
706	Westpoint Blacktown via Winston Hills and Kings Langley
M52	City Circular Quay

In April 2020 Transport for NSW completed works along Smith Street and Wilde Avenue to provide continuous bus lanes (between Darcy Street and Lamont Street) as part of the NSW Government's Bus Priority Infrastructure Program. The works involved:

- extending existing bus lanes in sections of Smith Street and Wilde Avenue
- installing new kerbside bus lane markings
- reconfiguring general traffic lanes between Darcy Street and George Street
- carrying out road resurfacing, line marking and signage changes.

These works are illustrated in Figure 8.

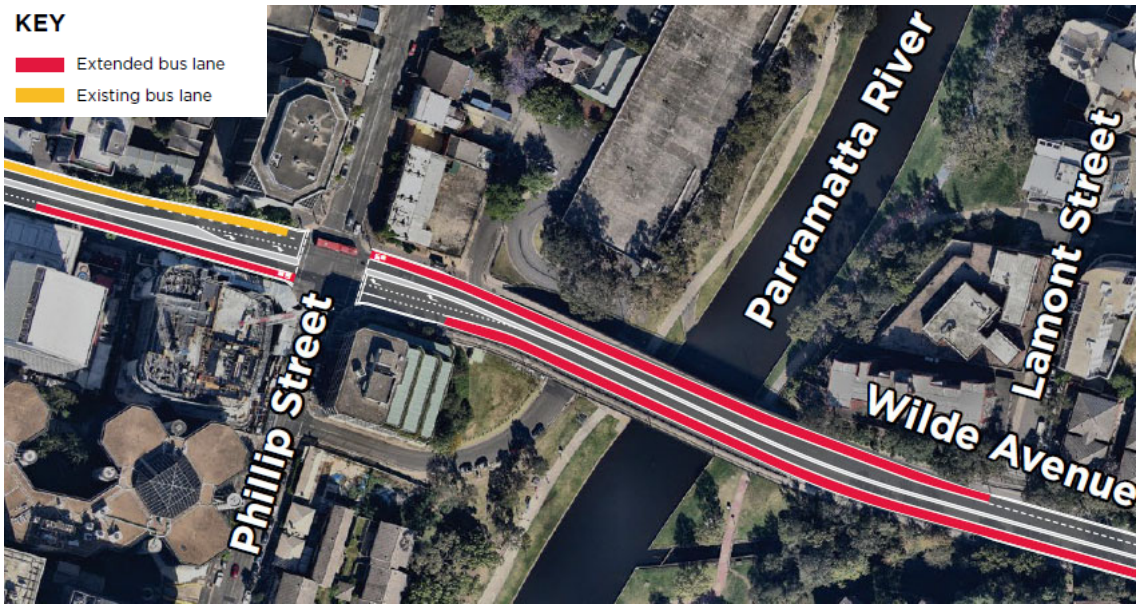


Figure 8 Proposed Smith Street bus lane extensions

Source: Transport for NSW

3.2.3 Ferry network

Ferry services are operated by Sydney Ferries from the Parramatta Ferry Wharf which is located at the eastern end of Phillip Street - approximately 400m walk away from the Powerhouse Parramatta site. Access to the street network is available via Phillip and Charles Street, with footpath access provided on both sides. A bus stop serviced by the Parramatta Free Shuttle bus is also available on Phillip Street.

The ferry wharf, located at the western end of the F3 line, provides a direct connection from Parramatta through to Barangaroo and Circular Quay in the east via the Parramatta River. Ferry services arrive and depart the wharf approximately once every hour.

3.2.4 Free shuttle bus

The Parramatta Shuttle Bus (formerly The Loop) is a free transport solution that connects tourists, residents and commuters to the commercial, retail and recreational landmarks of the city. The shuttle bus services the Parramatta CBD in a loop from 7am to 6.30pm Mondays to Fridays, and from 8am to 4pm on Saturdays, Sundays and public holidays

A stop is located adjacent to the site on Phillip Street. The free Parramatta Shuttle Bus runs every 10 minutes, seven days a week. Parramatta Light Rail will impact the route along Macquarie Street as shown in Figure 9.

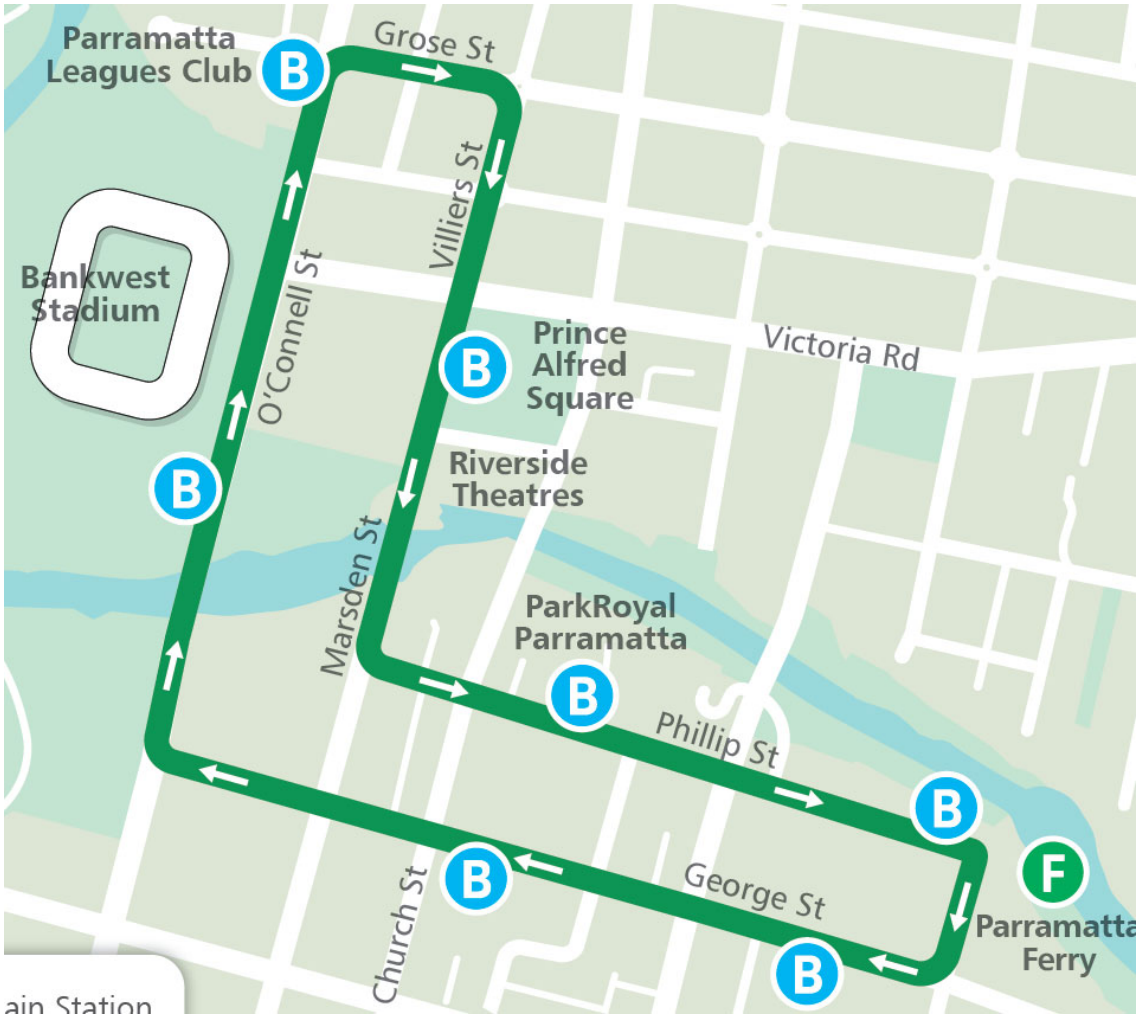


Figure 9 Parramatta free shuttle bus loop

3.2.5 Future public transport improvements

The NSW Government is currently planning for two major public transport projects which will directly benefit the Powerhouse Parramatta site and the Parramatta CBD more broadly. These projects will increase the already strong public transport accessibility to the site and benefit the overall transport network.

A description of these new public transport projects and their implication for the Powerhouse Parramatta project are described in the sections below.

Sydney Metro West

Sydney Metro West is an underground metro railway that will link the Parramatta and Sydney CBDs, expected to be operational by the end of this decade. New metro rail will become the fastest, easiest and most reliable journey between the Sydney and Parramatta CBDs. New stations are envisaged Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays and the City as shown in Figure 10.

The station at Parramatta will be located in the block bounded by George Street, Smith Street, Horwood Place and Macquarie Street, less than five minutes walk from the Powerhouse Parramatta site. This service will significantly enhance public transport accessibility to the Parramatta CBD and provide connections to future metro lines as outlined in the TfNSW Future Transport 2056 document.

Figure 10 Sydney Metro West map

Source: Transport for NSW

Parramatta Light Rail

Parramatta Light Rail (PLR) is a major NSW Government infrastructure project connecting Westmead, Parramatta, Camellia, Carlingford and Sydney Olympic Park. Stage 1 includes 16 stops from Westmead to Carlingford via Parramatta CBD and Camellia. The project is expected to open in 2023.

Stage 2 of the project is currently in planning with the preferred route connecting to Stage 1 and running north of the Parramatta River through Ermington, Melrose Park, Wentworth Point, Sydney Olympic Park, and terminating at Carter Street.

The closest stop to the Powerhouse Parramatta site is located on Church Street near Phillip Street ('Eat Street' stop), less than a five minute walk from the site.

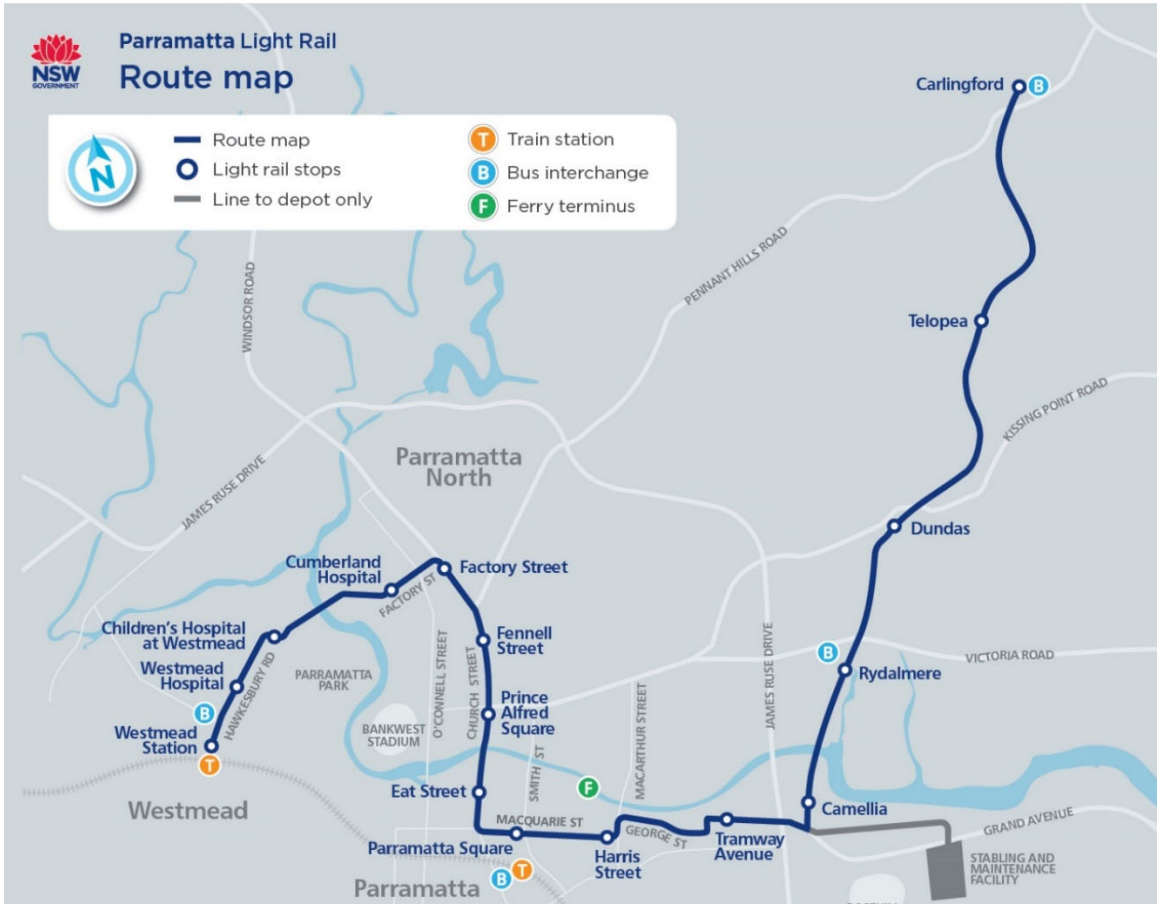


Figure 11 Parramatta Light Rail stage 1 route

Source: Transport for NSW

3.2.6 Public transport overview

An overview of the various forms of public transport servicing the Powerhouse Parramatta site, both currently and following the introduction of the additional public transport is presented in Figure 12 and Figure 13 respectively.

Figure 12 Existing public transport overview

Figure 13 Future public transport overview

3.3 Walking network

The site is in an established urban area with a good network of footpaths on either side of the street. The site is within a 10 minute walk of Parramatta train and bus interchange and the core CBD area. Crossing facilities are provided at all signalised intersections on approach to the site. A pedestrian (zebra) crossing is located on Phillip Street adjacent to the site entry, as shown in Figure 14.

Figure 14 Phillip Street pedestrian crossing

3.4 Cycling network

The primary cycleway serving the site is the Parramatta Valley Cycleway. The cycleway follows the foreshore of the Parramatta River, from Parramatta Park to Morrison Bay Park in Ryde. The Powerhouse Parramatta site is directly adjacent to the Parramatta Valley Cycleway, with a section of this route shown in Figure 15. This cycleway provides both connectivity to the Parramatta CBD and also the regional pedestrian and cycleway network.

Currently there is no formal bicycle parking or end of trip facilities on the site, however these will be provided as part of the Powerhouse Parramatta project (see Section 5.4 of this document).

Figure 15 Parramatta valley cycleway

As part of the Parramatta Light Rail project, an active transport link is to be delivered between Camelia and Carlingford which will connect up with the existing Parramatta Valley Cycleway (see Figure 16). This will further improve active transport access to the future Powerhouse Parramatta site.

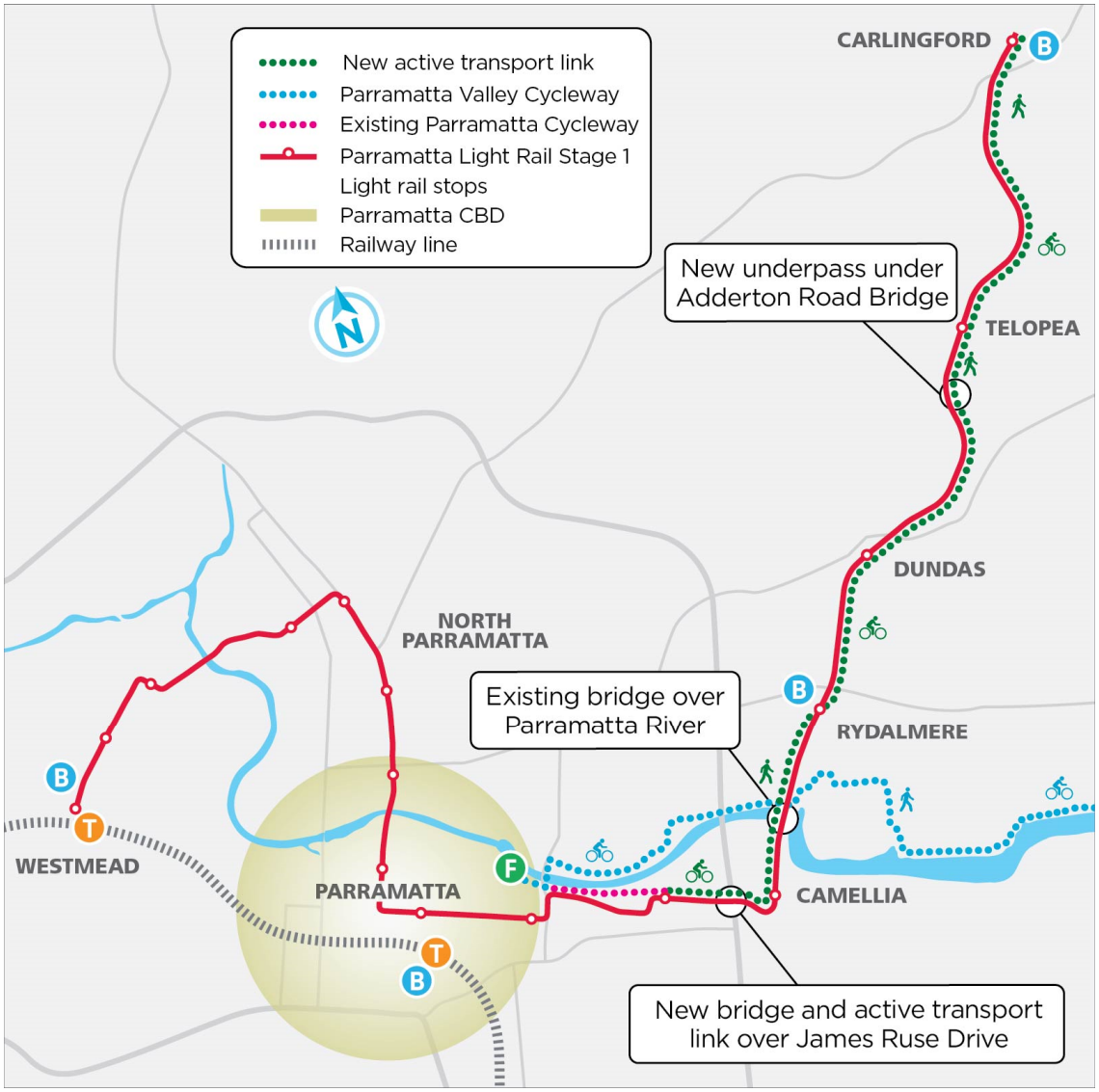


Figure 16 Future active transport link

Source: Transport for NSW

3.5 Vehicles

3.5.1 Road network

The site is well serviced by a network of Local, Regional and State roads as shown in Figure 17. Victoria Road to the north of the site is a State road which provides connectivity to the Sydney CBD as well as intermediate suburbs such as West Ryde, Gladesville and Drummoyne. O'Connell Street and Macarthur Street are regional roads that provide north-south connectivity at the periphery of the Parramatta CBD. Within the CBD itself all roads come under the direct control of the City of Parramatta Council, with through traffic movements discouraged through the provision of lower speed limits, pedestrian priority measures (e.g. crossings) and bus lanes. This is reflective of the role of CBD streets as prioritising the movement of pedestrians and public transport vehicles rather than private vehicles.

Figure 17 Existing road network

3.5.2 Site access points

There are currently three access points for vehicles into the site, as described below and illustrated in Figure 18:

- Dirrabarri Lane off Phillip Street, which is part of an easement to the adjacent Meriton apartments and facilitates emergency vehicle access to the Parramatta River as well as the adjacent GE building;
- Oyster Lane, which is currently a left turn only exit from the site onto the Wilde Avenue bridge; and
- George Khattar Lane, which is a road that passes under the Wilde Avenue Bridge. The height clearance under the bridge is 3.5m.

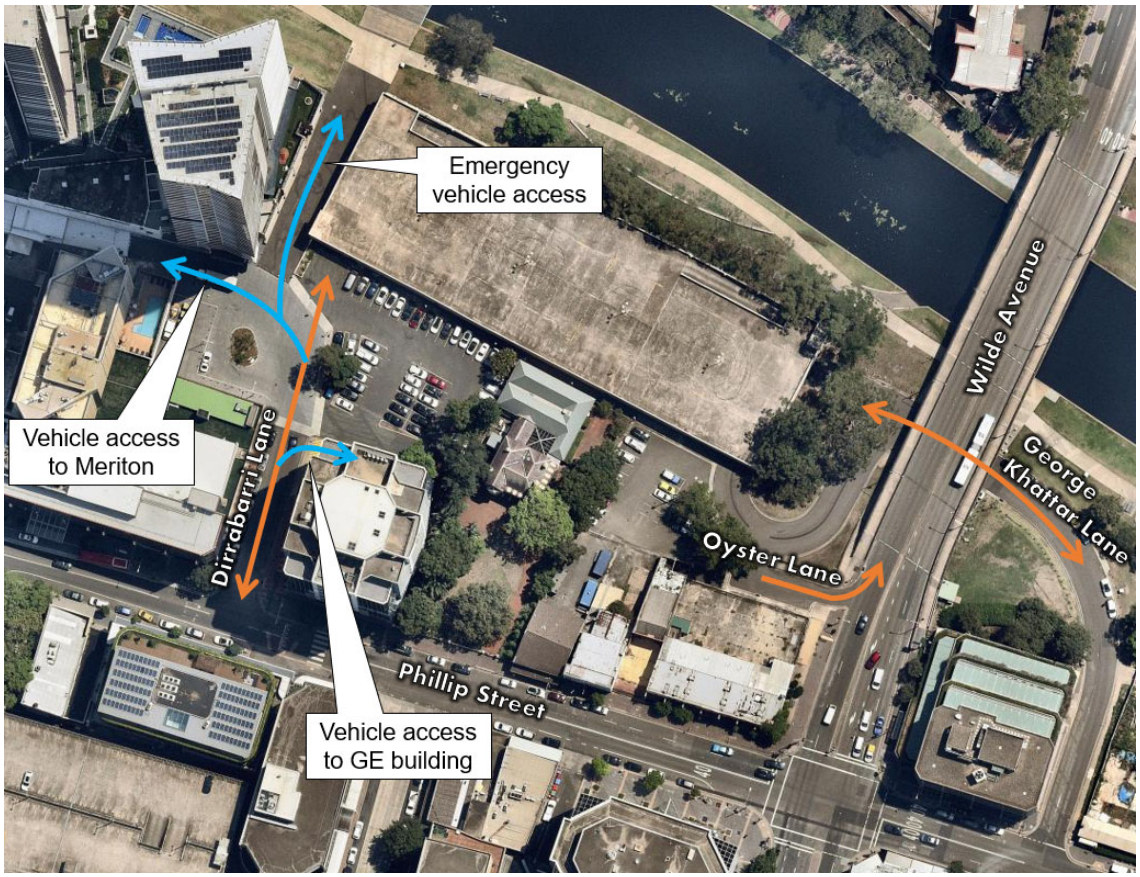


Figure 18 Existing vehicle site access points

3.5.3 Traffic movements

Traffic data collected adjacent to the site (east of Dirrabarri Lane) in November 2019 indicates that approximately 6,500 vehicles per day travel along Phillip Street adjacent to the Powerhouse Parramatta site, with the hourly movement profile shown in Figure 19. During the peak hour of the day (5pm – 6pm) approximately 550 vehicles per hour travel along Phillip Street, with a high number of these likely to be attributable to vehicles entering and exiting the existing Riverbank multi-storey car park.

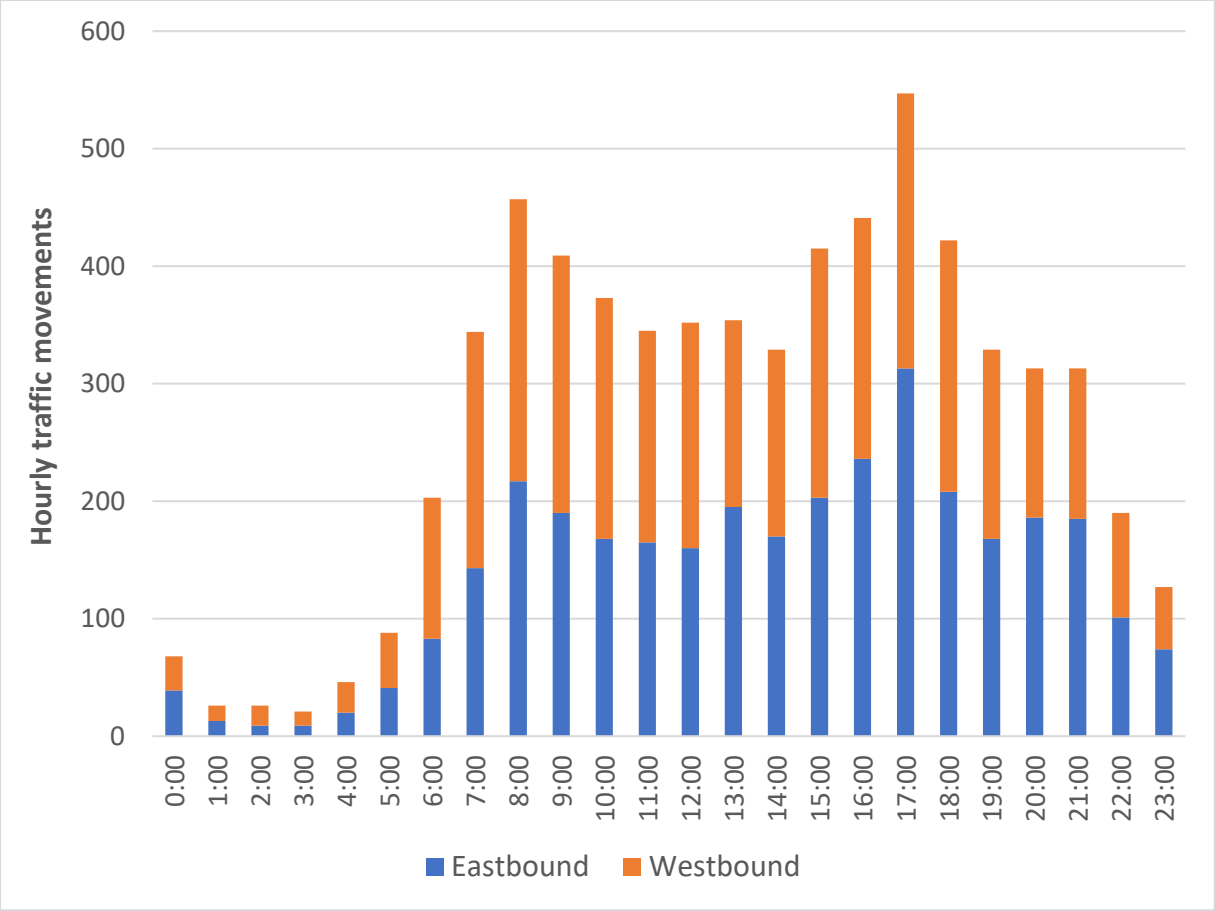


Figure 19 Hourly traffic movements – Phillip Street

Existing traffic movements into the Riverbank car park was provided by City of Parramatta Council. This indicates that approximately 650 vehicles per day enter the car park, equating to over 1,300 daily traffic movements. The average daily number of vehicle entries over the second half of 2019 into the Riverbank car park is illustrated in Figure 20 below.

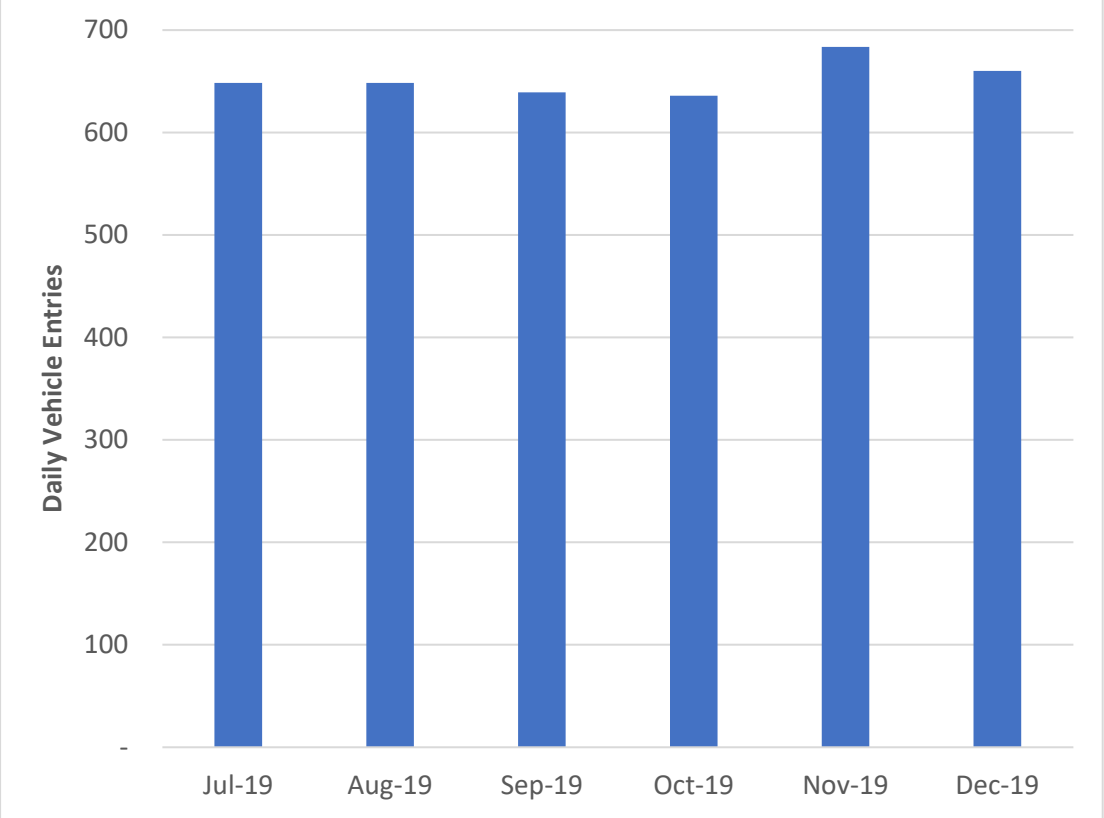


Figure 20 Average daily vehicle entries – Riverbank car park

3.6 Car parking

3.6.1 Off-street parking

There are a number of existing multi-level car parks under the control of City of Parramatta Council in close proximity to the site, as shown in Figure 21, containing approximately 3,500 car parking spaces. In addition to these Council controlled car parks, there are a further 9,000 spaces within the Parramatta CBD available for public use, including over 4,600 in Westfield Parramatta.

It should be noted that the Riverbank car park will be demolished to facilitate the development of the Powerhouse Parramatta, while the City Centre car park is also likely to be removed in the long term to accommodate the new Sydney Metro West station at Parramatta.

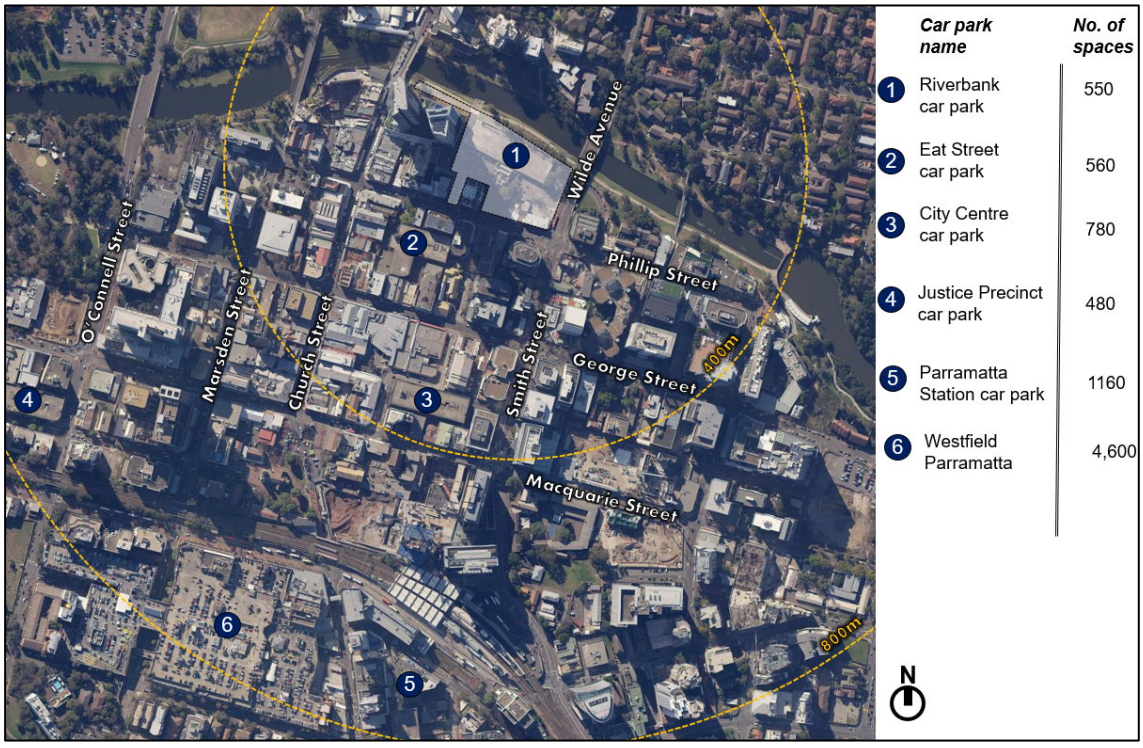


Figure 21 Existing Council controlled car parks

3.6.2 On-street car parking

On-street parking surrounding the site is time restricted – generally via parking meters (8am-6pm Monday- Saturday) within the Parramatta City Centre. 10P commuter parking is provided in Harris Street and George Street (east of Harris Street). Short-stay 2P/4P meter parking is provided in Charles Street, Phillip Street and George Street (west of Harris Street).

Parking is generally provided at $2.50 per hour for short-stay areas and $1.50 per hour for commuter parking areas, with rates up to $3.50 within the central CBD.

3.7 Point to point transport

There are a number of existing locations in the vicinity of the site to support point to point transport vehicles. Passenger drop off and pick up areas are provided on Phillip Street, George Khattar Lane and George Street, while dedicated taxi ranks are located on Phillip Street and Smith Street. These existing point to point arrangements are presented in Figure 22.

Figure 22 Existing point to point transport arrangements

4 Description of Proposal

4.1 Proposal overview

The Powerhouse was established in 1879, and Powerhouse Parramatta will radically return to its origins through the creation of seven presentation spaces of extraordinary scale that will enable the delivery of an ambitious, dynamic constantly changing program that provides new levels of access to Powerhouse Collection. The Powerhouse will set a new international benchmark in experiential learning through the creation of an immensely scaled 360-degree digital space, unique to Australia.

Powerhouse Parramatta will reflect the communities and cultures of one of Australia's fastest growing regions. It will hold First Nations culture at its core and set a new national benchmark in culturally diverse programming. The Powerhouse will be highly connected through multiple transport links, and integrate into the fine grain of the city.

Powerhouse Parramatta will be an active working precinct and include the Powerlab, which will enable researchers, scientists, artists and students from across regional NSW, Australia and around the world to collaborate and participate in Powerhouse programs. The Powerlab will feature digital studios to support music and screen industries alongside co-working spaces, life-long learning and community spaces. Integrated into the Powerlab will be a research kitchen and library that will support a NSW industry development program including archives and oral histories.

This application will deliver a new cultural institution for Parramatta in the heart of Sydney's Central City. The SSD DA seeks consent for the delivery of the Powerhouse Parramatta as a single stage, comprising:

- site preparation works, including the termination or relocation of site services and infrastructure, tree removal and the erection of site protection hoardings and fencing;
- demolition of existing buildings including the existing Riverbank Car Park and 'Willow Grove' (with Willow Grove to be relocated to another site);
- construction of the Powerhouse Parramatta, including:
    - seven major public presentation spaces for the exhibition of Powerhouse Collection;
    - front and back-of-house spaces;
    - studio, co-working and collaboration spaces comprising the 'Powerlab', supported by 30 residences (serviced apartments) for scientists, researchers, students and artists;

  - education and community spaces for staff, researchers and the Powerlab residents, the community, and education / commercial hirers;
  - commercial kitchen comprising the 'Powerlab Kitchen' used for cultural food programs, research, education and events;
  - film, photography, and postproduction studios that will connect communities with industry and content that will interpret the Powerhouse Collection;
  - public facing research library and archive for community, industry, students and researchers to access materials; and
  - a mix of retail spaces including food and drink tenancies with outdoor dining.
- operation and use of the Powerhouse Parramatta including use of the public domain provided on the site to support programs and functions;
- maintenance of the existing vehicular access easement via Dirrabarri Lane, the removal of Oyster Lane and termination of George Khattar Lane, and the provision of a new vehicular access point to Wilde Avenue for loading;
- public domain within the site including new public open space areas, landscaping and tree planting across the site; and
- building identification signage.

The project does not seek consent for the carrying out of works outside of the site boundary, and in particular does not involve any alterations to the existing edge of the formed concrete edge of the Parramatta River or to the waterway itself.

4.2 Transport aspects of proposal

Key aspects of the proposal relating to traffic and transport include:

- Two dedicated on-site loading areas fully contained within the site, accessed via Dirrabarri Lane
- Existing vehicle site egress point at Oyster Lane to be closed
- New dedicated layby facility on the northern side of Phillip Street for coach drop off / pick up as well as for point to point transport services and loading
- Vehicular access maintained along Dirrabarri Lane for emergency vehicles to Parramatta River as well as general vehicles accessing the Meriton and GE buildings
- No on-site parking for staff or visitors to encourage use of public transport
- Bicycle parking spaces for staff (with associated end of trip facilities) and bicycle parking for visitors within the public domain
- Minimum 12m wide pedestrian central access way through the site, providing a connection through to the future Civic Link

5 Transport Impact Assessment

5.1 Forecast mode share

The forecast mode share for visitors travelling to the Powerhouse Parramatta has been forecast based on:

- Findings of the travel surveys for the existing Powerhouse Museum at Ultimo;
- The current and future transport environment in Parramatta, taking into consideration future public transport enhancements such as Sydney Metro West and Parramatta Light Rail; and
- The policy of not providing any on-site visitor parking for the Powerhouse Parramatta.

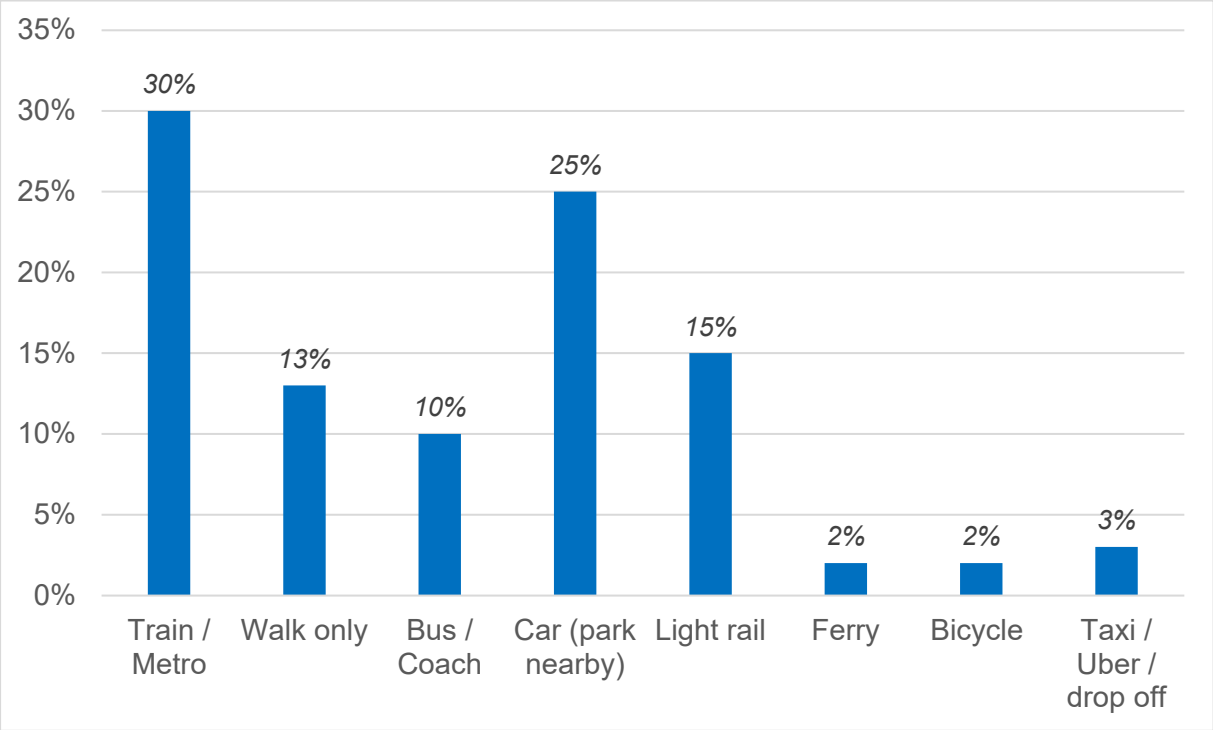


Figure 23 Mode share forecasts for visitors to the Powerhouse Parramatta

5.2 Travel demand

5.2.1 Forecast daily visitation

Over the course of a typical day it is forecast the Powerhouse Parramatta will generate the following levels of visitation:

- 5,000 visitors per day over a typical weekday
- 6,000 visitors per day over a typical weekend

5.2.2 Forecast activity profile

Detailed activity profiles for both visitor arrivals and departures to the Powerhouse Parramatta, based on current and expected visitation behaviours, is shown in Figure 24 below. This indicates that visitors will be arriving and departing the site constantly throughout the day, rather than all arriving and departing at the same time. This spread of arrivals and departures throughout the day and evening reduces the pressure on the transport network by limiting the number of people movements during peak hours of the day.

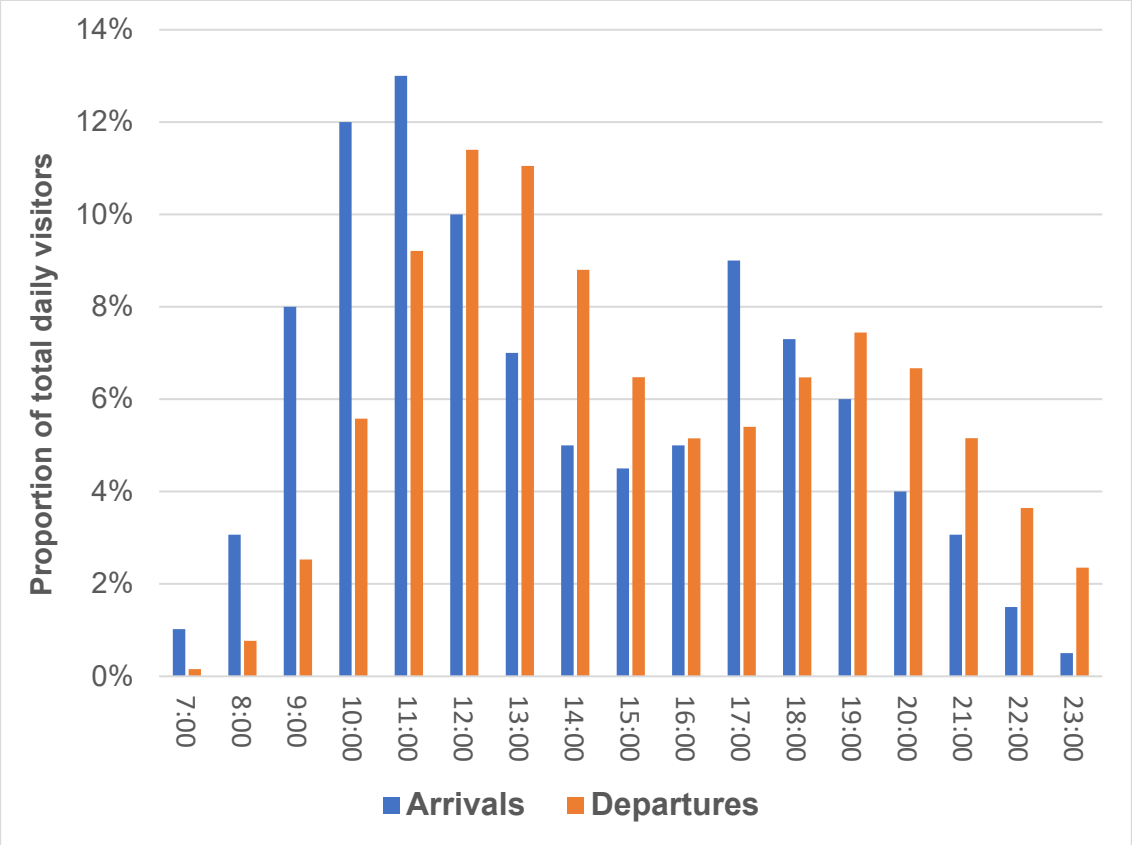


Figure 24 Forecast visitor arrival / departure profile

5.2.3 Future travel demand – typical day

The level of travel demand to the Powerhouse Parramatta site for a typical weekday (5,000 visitors per day) and weekend (6,000 visitors per day) is summarised in Table 6 and Table 7 respectively. These forecasts have been developed based on the forecast future modal split and expected arrival and departure times of people visiting the site.

This assessment has confirmed that the supporting transport network has the ability and capacity to accommodate future travel requirements.

Table 6 Forecast future hourly activity profile – weekday

Time	Arrivals per hour (weekday)									
	Train / Metro	Walk only	Taxi / Uber / drop off	Bus	Coach	Car (park nearby)	Light rail	Ferry	Bicycle	**Total**
7:00	15	7	2	5	0	13	8	1	1	**51**
8:00	46	20	5	15	0	38	23	3	3	**153**
9:00	109	47	11	36	36	91	55	7	7	**400**
10:00	164	71	16	55	54	137	82	11	11	**600**
11:00	177	77	18	59	59	148	89	12	12	**650**
12:00	137	59	14	46	45	114	68	9	9	**500**
13:00	96	41	10	32	32	80	48	6	6	**350**
14:00	68	30	7	23	25	57	34	5	5	**250**
15:00	68	29	7	23	0	56	34	5	5	**225**
16:00	75	33	8	25	0	63	38	5	5	**250**
17:00	135	59	14	45	0	113	68	9	9	**450**
18:00	110	47	11	37	0	91	55	7	7	**365**
19:00	90	39	9	30	0	75	45	6	6	**300**
20:00	60	26	6	20	0	50	30	4	4	**200**
21:00	46	20	5	15	0	38	23	3	3	**153**
22:00	23	10	2	8	0	19	11	2	2	**75**
23:00	8	3	1	3	0	6	4	1	1	**25**
Total	**1425**	**618**	**143**	**475**	**248**	**1188**	**713**	**95**	**95**	**5000**

Table 7 Forecast future hourly activity profile – weekend

Time	Arrivals per hour (weekend)									
	Train / Metro	Walk only	Taxi / Uber / drop off	Bus	Coach	Car (park nearby)	Light rail	Ferry	Bicycle	**Total**
7:00	18	8	2	6	0	15	9	1	1	**61**
8:00	55	24	6	18	0	46	28	4	4	**184**
9:00	137	59	14	46	24	114	68	9	9	**480**
10:00	205	89	21	68	36	171	103	14	14	**720**
11:00	222	96	22	74	42	185	111	15	15	**780**
12:00	171	74	17	57	30	143	86	11	11	**600**
13:00	120	52	12	40	21	100	60	8	8	**420**
14:00	86	37	9	29	15	71	43	6	6	**300**
15:00	81	35	8	27	0	68	41	5	5	**270**
16:00	90	39	9	30	0	75	45	6	6	**300**
17:00	162	70	16	54	0	135	81	11	11	**540**
18:00	131	57	13	44	0	110	66	9	9	**438**
19:00	108	47	11	36	0	90	54	7	7	**360**
20:00	72	31	7	24	0	60	36	5	5	**240**
21:00	55	24	6	18	0	46	28	4	4	**184**
22:00	27	12	3	9	0	23	14	2	2	**90**
23:00	9	4	1	3	0	8	5	1	1	**30**
Total	**1750**	**758**	**175**	**583**	**165**	**1458**	**875**	**117**	**117**	**6000**

5.2.4 Future travel demand – sensitivity assessment

Under various event scenarios the Powerhouse Parramatta may accommodate up to 10,000 people at any one time (buildings and public domain). These events will typically be staggered as no one space within the site can accommodate this number of people. Therefore it is expected that people will be arriving and departing the site over a two to three hour period, rather than condensed within a single hour like is the case for sporting or other cultural events. This dispersed arrival / departure profile will assist in mitigating impacts on the transport network.

A sensitivity assessment has been undertaken in this transport assessment to consider a worst-case utilisation scenario where 10,000 people all arrive in a single hour of the day. This situation is highly unlikely to ever occur, however has been assessed for the purposes of 'stress-testing' the ability of the transport network to accommodate events at Powerhouse Parramatta.

Adopting the forecast mode shares as previously noted in this document, the level of travel demand generated under this scenario is summarised in Table 8.

Table 8 Travel demand – high utilisation scenario

Mode	Mode Share	No. of trips (peak hour)	# of vehicles*
Train / Metro	30%	3,000	n/a
Walk only	15%	1,300	n/a
Taxi / Uber / Drop off	3%	300	100
Bus	10%	1,000	n/a
Car (park nearby)	25%	2,500	833
Light rail	15%	1,500	n/a
Ferry	2%	200	n/a
Bicycle	2%	200	n/a

** Based on a typical car occupancy rate of 3 people per vehicle, consistent with that surveyed on weekends at the existing Powerhouse Museum at Ultimo*

It should be noted that the public transport network supporting the Parramatta CBD is capable of accommodating large numbers of people arriving and departing on a daily basis. Events can be held at the nearby Bankwest Stadium which accommodates 30,000 people – the majority of which travel by public transport. Generally no additional train services are required to operate to service these events at Bankwest Stadium, with Parramatta train station one of the highest capacity rail stations on the Sydney Trains network. On occasions however additional trains have been operated at Parramatta Station to service events at Bankwest Stadium. Therefore the public transport network servicing the Parramatta CBD is well suited to accommodating the demands generated by the future Powerhouse Parramatta site, even under a worst-case high utilisation scenario.

100 vehicle drop off movements are forecast, equating to less than two vehicles per minute. This can easily be accommodated in the existing set-down areas near the site or within the future coach layby area (outside of 9am – 3.30pm on weekdays).

The sensitivity assessment indicates that under a worst-case high utilisation scenario up to 830 vehicles may require parking within the Parramatta CBD. This is equivalent to less than 7% of the more than 12,500 publicly available parking spaces within the Parramatta CBD.

With respect to the operation of the road network in the CBD, the impacts of the additional car trips will be mitigated by the fact that vehicles will not be concentrated in one particular area – instead dispersing across a number of car parking areas. Further, these high utilisation scenarios are more likely to occur either on a weekend or in the evening when traffic volumes through the Parramatta CBD are significantly reduced when compared to during peak commuter hours.

Notwithstanding the above, and in accordance with the SEARs, traffic modelling has been undertaken at the Smith Street / Phillip Street / Wilde Avenue intersection to understand potential traffic impacts during a high utilisation scenario. The modelling has taken into consideration:

- Future (2026) traffic flows through the intersection as forecast in the Parramatta Light Rail Stage 1 EIS document
- Additional traffic movements associated with a high utilisation scenario at the Powerhouse Parramatta, with approximately 40% of all arrivals assumed to travel through this one intersection. Given the number of arrival points into the Parramatta CBD and the dispersed nature of traffic movements to various parking stations, this assumption is considered highly conservative
- Reduction in traffic movements through this intersection following the removal of 550 space Riverbank car park

The PM weekday peak hour has been analysed in the traffic modelling as this is the most critical time of day for the road network in the Parramatta CBD.

Table 9 Traffic modelling – high utilisation scenario

Scenario	Intersection Performance	
	Average delay	Degree of Saturation
Future 2026 PM peak hour	73	1.02
Future 2026 PM peak hour with high utilisation scenario at Powerhouse Parramatta	79	1.02

The traffic modelling demonstrates that, even under a worst-case high utilisation scenario adopting conservative assumptions, the adjacent road network performance will perform at a similar level to that currently forecast. The overall degree of saturation of the intersection remains unchanged, with a minor increase in average vehicle delay of six seconds – equivalent to an 8% increase. Given the conservative assumptions adopted and the infrequency of this scenario occurring, particularly during the busiest hour of the day, this impact is considered acceptable.

5.3 Pedestrians

The majority of pedestrians are expected to enter the Powerhouse Parramatta site from the south via the entry point on Phillip Street opposite Horwood Place. This access point will form part of the future pedestrian connection known as 'Civic Link' - a green, pedestrianised public space that provides a direct connection from Parramatta transport interchange through to the Parramatta River (to be delivered by City of Parramatta Council). The link will ultimately be approximately 490 metres long running along the existing Horwood Place alignment and connecting the Powerhouse Parramatta with key sites in the Parramatta CBD such as Parramatta Square, the future metro station as well as the existing transport interchange. This project will significantly improve pedestrian access to the Powerhouse Parramatta.

The design of the Powerhouse Parramatta makes provision for the Civic Link connection by providing a 12m wide pedestrianised space between the eastern and western buildings on the site. This will align with a relocated pedestrian (zebra) crossing on Phillip Street which will facilitate safe access for pedestrians travelling along Civic Link into the Powerhouse Parramatta.

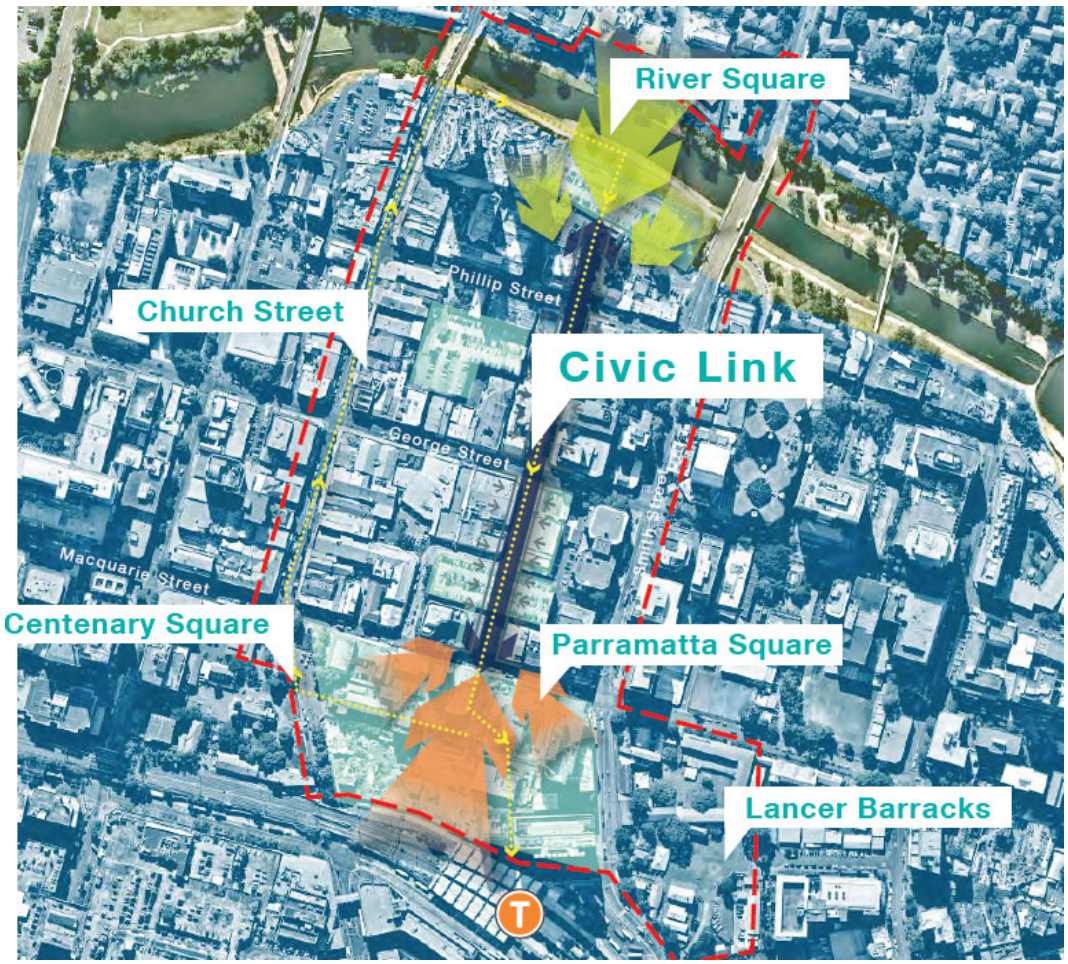


Figure 25 Future Civic Link connection

Source: City of Parramatta Council

The design also makes provision for pedestrian connectivity from the north adjacent to the Parramatta River. This will service visitors travelling from the Parramatta Ferry Wharf or those walking along the Parramatta Valley Cycleway. Pedestrians will also be able to access the precinct via Dirrabarri Lane from both Phillip Street and the riverfront.

Enhanced east-west connectivity is proposed as part of the project through the 'powerline' pedestrian connection between the Lennox Bridge and Wilde Avenue Bridge. This connection will facilitate direct connectivity to the future light rail stop on Church Street.

An illustration of the proposed pedestrian connections is provided in Figure 26.

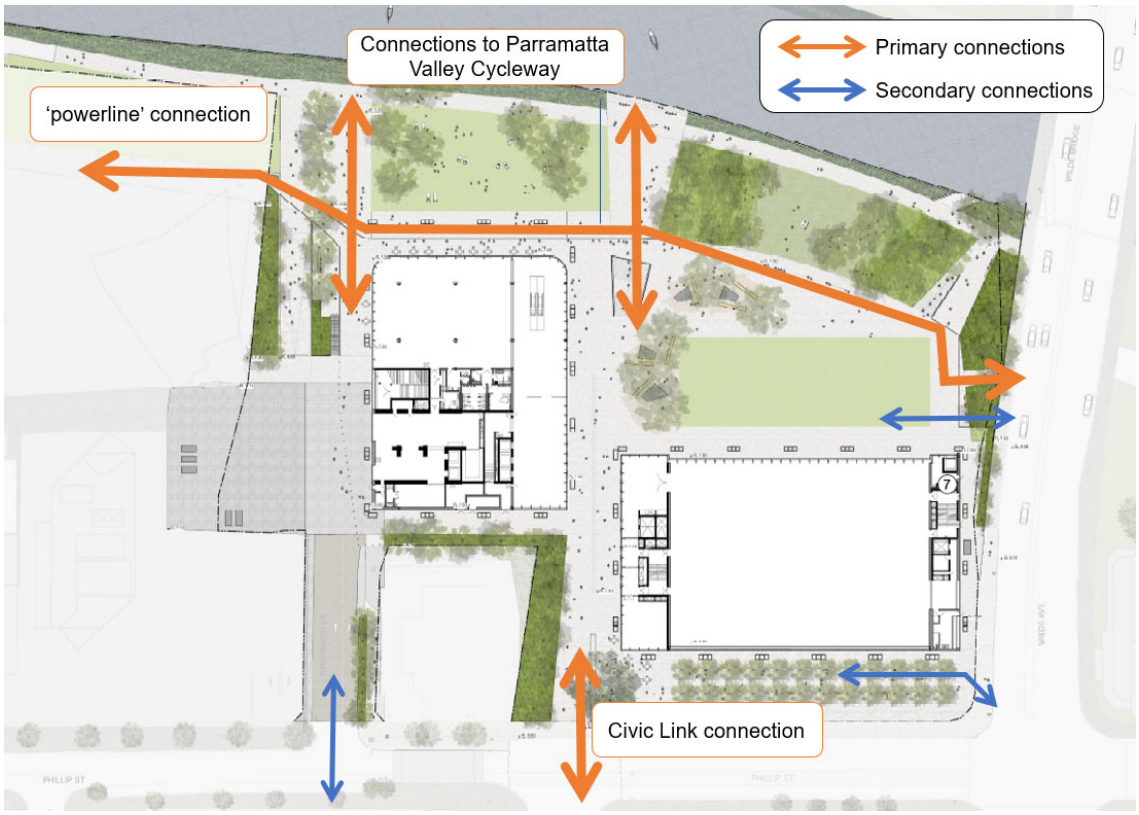


Figure 26 Pedestrian access to Powerhouse Parramatta

5.4 Cycling

5.4.1 Bicycle routes

The Parramatta bike plan, developed by City of Parramatta Council in May 2017, proposes a number of enhancements to the local and regional bicycle network which will improve access for staff and visitors travelling to the Powerhouse Parramatta. In particular new north-south links are proposed which will connect the site with North Parramatta, as well as improvements to the existing Parramatta Valley Cycleway route. The proposed network of routes is shown in Figure 27.

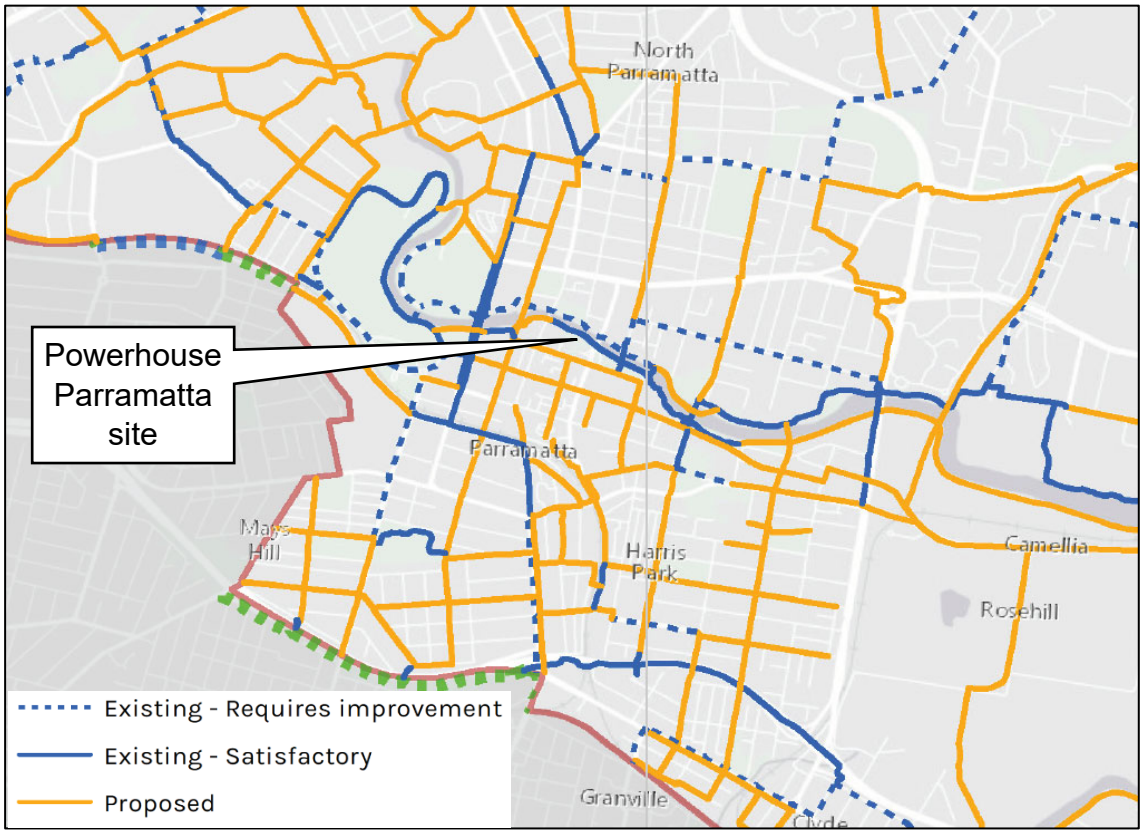


Figure 27 Proposed Parramatta cycling network

Source: Parramatta bike plan, 2017

5.4.2 Bicycle parking

To encourage access by bicycle to the Powerhouse Parramatta, bicycle parking is proposed for staff, residents and visitors of the site. In considering appropriate rates of bicycle parking to be applied for the site, the City of Parramatta Development Control Plan (DCP) and the NSW Planning Guidelines for Walking and Cycling document have been referenced. Both of these documents are noted in the SEARs for the project.

The adopted bicycle parking and end of trip facility provision for the Powerhouse Parramatta is summarised below.

Resident bicycle parking

The residential dwellings will act as short term residences, similar to serviced apartments. As the City of Parramatta DCP does not provide a bicycle parking rate for short term residential accommodation, the relevant bicycle parking rate from the *NSW Planning Guidelines for Walking and Cycling* document has been adopted. This recommends a bicycle parking rate of up to 1 space / 10 rooms for serviced apartments, requiring 3 bicycle parking spaces.

Staff bicycle parking

The City of Parramatta DCP recommends a bicycle parking rate of 1 space / 200m^2 GFA for commercial / retail uses. This is equivalent to approximately 1 space for every 13 staff members, or 7.5% of the building population. This bicycle parking rate also aligns with the requirements under Green Star. Therefore this rate has been adopted for all staff of the building, requiring up to 15 bicycle parking spaces. These parking spaces will be located in a secure (lockable) undercover area accessed via the ground plane. End of trip facilities (lockers, showers and change areas) will be provided for staff within the western building.

Visitor bicycle parking

It is expected that between 1% and 2% of total visitors to the Powerhouse will arrive by bicycle. On a typical weekday / weekend there could be as many as 2,000 visitors on site at one time. Therefore the current design has accommodated 60 bicycle parking spaces within the public domain for use by visitors. It should be noted that the public domain design does not preclude increases to this number of spaces in future. The operator will monitor the demand for visitor bicycle parking and, should demand warrant, provide additional capacity.

5.5 Public transport

The number of additional trips by public transport modes was determined in Section 5.2 (Travel Demand). Total people arriving by various public transport modes is summarised in Table 10, with 333 weekday peak hour trips and 407 weekend peak hour trips in each direction. The existing public transport services, when considered in conjunction with the planned public transport initiatives described in the previous section, are more than adequate to service the site.

Table 10 Total public transport trips

Mode	Additional public transport trips (peak hour)	
	Weekday	***Weekend***
Train / metro	185	222
Light rail	86	111
Bus	62	74
Total	***333***	***407***

In the context of:

- The project level of additional trips generated on the public transport network;
- The already strong public transport network servicing the Parramatta CBD; and
- The future public transport projects currently being delivered or planned by the NSW Government

No further enhancements to the public transport network are considered necessary to support the Powerhouse Parramatta project.

5.6 Vehicle access arrangements

A summary of the proposed vehicle access arrangements to the Powerhouse Parramatta site is illustrated in Figure 28. This strategy includes:

- Primary loading and servicing vehicle access via Dirrabarri Lane (accessed from Phillip Street)
- Servicing of Presentation Space 1 and Presentation Space 2 (through the floor via Presentation Space 1) directly via Wilde Avenues (scheduled and out of peak hours only)
- Existing vehicle site egress point at Oyster Lane to be closed
- Coach pick up and drop off on the northern side of Phillip Street via a dedicated layby area, coaches to lay over elsewhere
- Point to point transport vehicles to utilise coach lay by area after 3.30pm through the provision of a 'no parking' area
- Emergency vehicle access maintained along Dirrabarri Lane through to Parramatta River

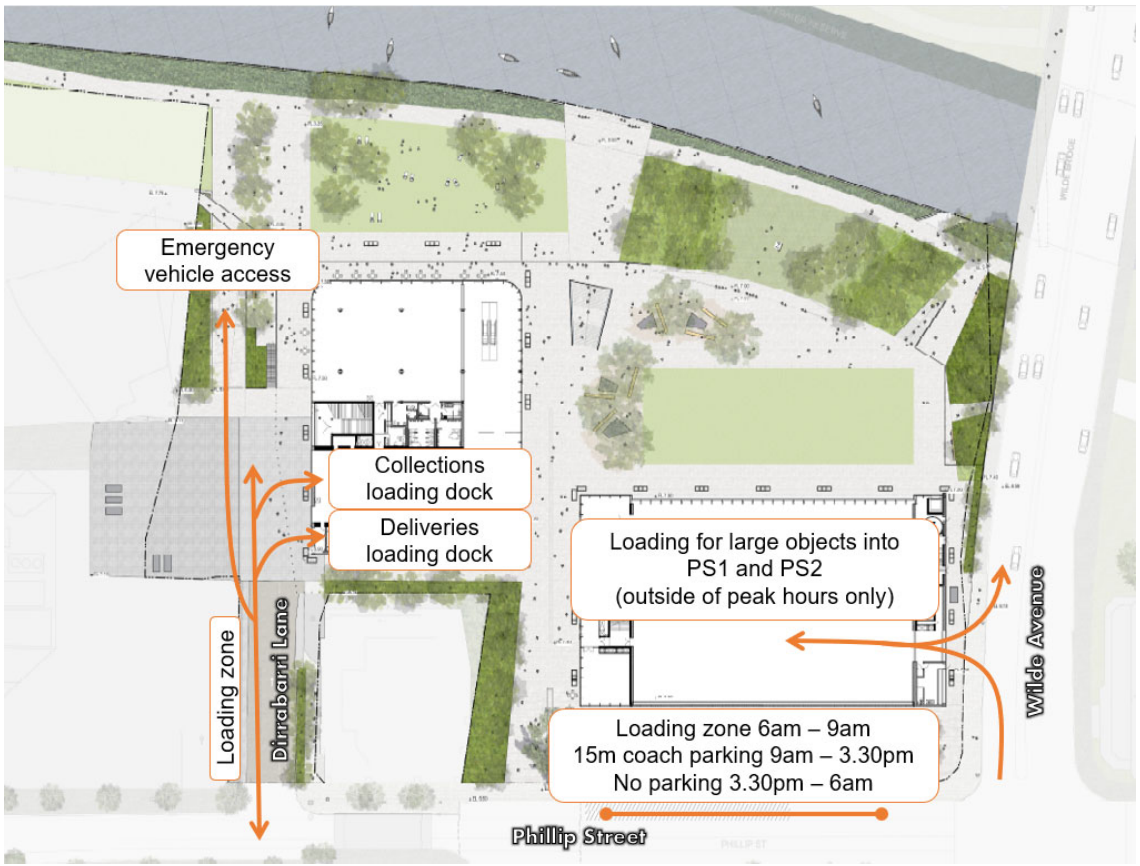


Figure 28 Vehicle access strategy summary

Further details in relation to vehicle access arrangements are provided in the following sections.

5.7 Loading and servicing

5.7.1 Loading dock access

Access to the loading areas within the site are proposed as follows:

- Via Dirrabarri Lane for the two dedicated on-site loading docks proposed to service the Powerhouse Parramatta site. Access to these docks from the wider road network will be provided via Wilde Avenue and Phillip Street.
- Directly via Wilde Avenue to facilitate access for large (19m) vehicles servicing Presentation Space 1 and Presentation Space 2 through the floor from Presentation Space 1. Access into this area would generally only occur occasionally during the changeover of exhibitions and be scheduled well in advance. Given Wilde Avenue's role as a strategic bus corridor, vehicles would not access the site via this access point during peak weekday periods between 7am – 10am and 4pm – 7pm. Instead deliveries would be timed outside of these hours so as not to impact the transport network.

The design has made provision for all service vehicles to enter and exit the site in a forwards direction, with no vehicles required to reverse over public footpaths.

Swept path diagrams indicating access to the on-site loading areas are provided in **Appendix A** of this document.

5.7.2 Freight and servicing profile

Following discussions with the Museum of Applied Arts and Sciences (MAAS), the future operator of Powerhouse Parramatta, the forecast number of service vehicle movements, separated by vehicle type, for the new Powerhouse Parramatta facility has been forecast. This profile is shown in Figure 29 below.

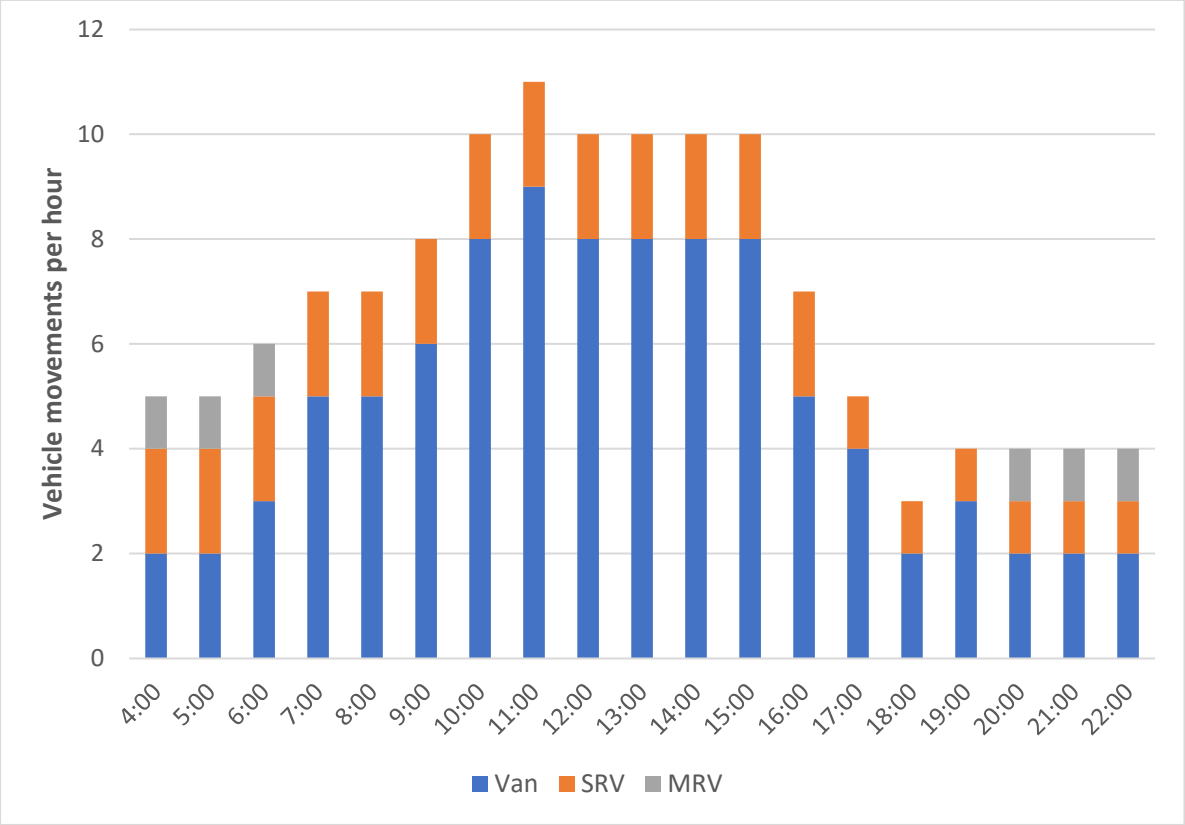


Figure 29 Forecast typical daily freight and servicing profile

5.7.3 Loading dock configuration

Two permanent on-site loading docks (accessed via Dirrabarri Lane) are proposed which would have separate functions given the various uses within the site.

The northernmost dock will accommodate deliveries of Powerhouse collection / exhibition items. The design makes provision for these high value items to be completed separated from food and waste deliveries. This dock can accommodate either a 19m articulated vehicle or two 12.5m heavy rigid vehicles (HRVs) simultaneously.

The southernmost dock will service the retail, catering and waste collection requirements of the building. The dock itself can accommodate a 10m medium rigid vehicle (MRV).

In addition, two other areas have been identified which can be used to accommodate loading and servicing through the day, particularly for smaller vans and utes. These are as follows:

- On the western side of Dirrabarri Lane, at the location of the existing short term parking spaces (3 spaces)
- Within the coach drop off / pick up layby zone, between the hours of 6am-9am when this area is not required for coaches (up to 10 spaces)

5.7.4 Loading dock management

The loading docks within the site have been designed to accommodate the anticipated level of vehicle demand generated throughout the day.

It is envisaged the onsite management of the loading dock will consist of a combination of an on-site dock manager and a dock management system (DMS). The DMS will enable the onsite management team to scheduled truck delivery times and allocate docks.

Trucks intending to use the docks will not be permitted to come to site without making a booking beforehand. The major benefit of the implementation of such a system is the ability to moderate demand throughout the day. The allocation of deliveries to timeslots (with strict length of stay limits) reduces the risk the loading dock reaching capacity and manages traffic flow into the site during peak periods. The booking system also largely mitigates the risk of vehicle queues forming to enter the site and improving the flow of traffic on the adjacent streets.

The duration of stay of heavy vehicles for the loading dock is likely to be 15 – 30 minutes. The operator will enforce a strict 30 minute vehicle time limit to ensure the loading dock provides for a strong level of vehicle turnover throughout the day.

For long dwell time vehicles such as those transporting high value collection items, deliveries will typically be scheduled well in advance and undertaken outside of busy periods. The instances of these vehicles being on site is generally low given they will only be required at times of changeover of exhibitions within the site.

5.7.5 Ability to accommodate demand

Given the expected profile of service vehicle movements, amount of service vehicle parking bays available as well as the vehicle duration of stay, the loading area will have sufficient capacity to meet the needs of the future site.

5.8 Coaches

The design proposes a coach pick up / drop off area on the northern side of Phillip Street, adjacent to the central access way through the site. Based on current requirements for the Powerhouse Museum at Ultimo and the envisaged uses for Parramatta it is reasonable to plan for three buses/coaches to service the site at any one time.

Providing parking for coaches within the site boundary was not supported on the basis that:

- It would significantly detract from the public domain within the site due to the turning circle requirements for these vehicles
- It would result in additional conflicts between vehicles and pedestrians walking on Phillip Street crossing Dirrabarri Lane
- Parking for buses/coaches would likely need to be provided adjacent to or in close proximity to the site loading dock, including sharing an access point from Phillip Street. Therefore children hopping on/off coaches would conflict with large service vehicles entering/exiting the loading dock.

A more appropriate solution is to utilise kerbside space on the northern side of Phillip Street for drop off and pick up purposes. This would provide passengers (particularly school children) with safe and convenient access to the site via the future central access way through the site. Coach parking could be provided in this space between 9.30am – 4.00pm, with other kerbside uses possible outside of these hours.

A 40m long drop off / pick up area has been designed which can accommodate up to two coaches parked at any one time. This has capacity for over 100 passengers at any one time, which is greater than the expected level of demand as previously noted in Section 5.2.3 of this document.

Coaches would then find parking off-site in nearby designated areas before returning to Phillip Street at a designated time to pick up passengers. Given the constraints for coach parking in the Parramatta CBD on weekdays, layover will take place in locations away from the CBD. Consistent with the findings of the transport assessment as well as Council's response, off-site coach layover on weekdays is proposed to be located within the Camellia precinct as shown in Figure 30. Potential streets for coach parking would be both Grand Avenue and Colquhoun Street.

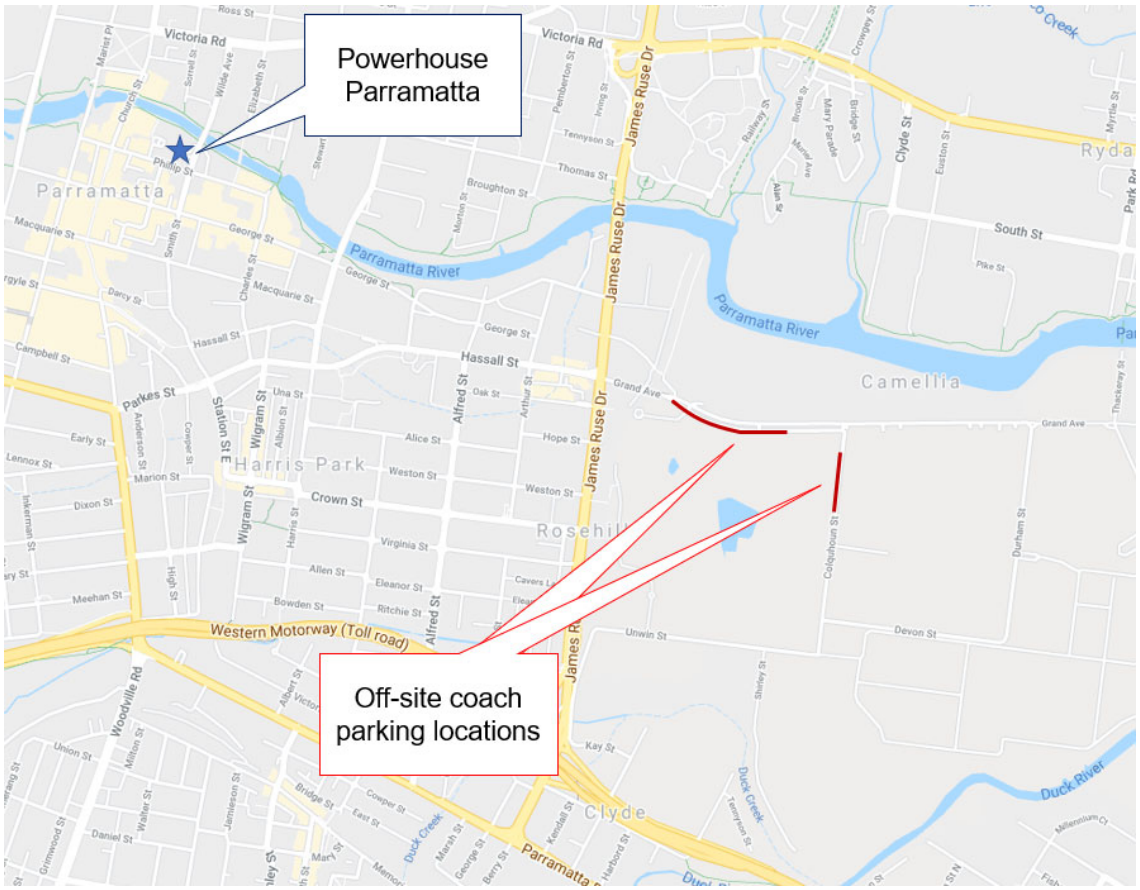


Figure 30 Coach layover management

5.9 Point to point transport

As previously noted in Section 3.7 there are a number of existing locations in close proximity to the Powerhouse Parramatta to support point to point transport vehicles. This includes formal pick up / drop off locations within 2-3 minute walk of the site entry point:

- Phillip Street (full taxi zone)
- George Khattar Lane (set down / pick up area)
- Smith Street (night time taxi zone)

In addition to these existing areas, it is recommended that the proposed coach pick up / drop off area on the northern side of Phillip Street be utilised as a dedicated zone for point to point transport vehicles outside of 9.30am-3.30pm on weekdays. This flexible use of kerbside space provides an efficient solution to managing the transport requirements of the precinct, noting that a higher number of point to point transport journeys are likely to take place in the evenings at times when coach parking for the Powerhouse Parramatta is not required.

Another option in relation to point to point transport provision is to designate some existing on-street parking spaces on George Khattar Lane for short term pick up / drop off. This would provide convenient access to the future Powerhouse Parramatta for visitors, however will require further discussions with City of Parramatta Council prior to implementation.

A concept layout of the potential turnaround arrangements on George Khattar Lane is provided in Figure 31 below. This indicates the extent of parking and drop off / pick up area that may be provided to service the Powerhouse Parramatta – consistent with feedback received from City of Parramatta Council. It is confirmed that these works will be completed as part of this project. A more detailed engineering plan will be provided to Council prior to the commencement of construction for feedback.

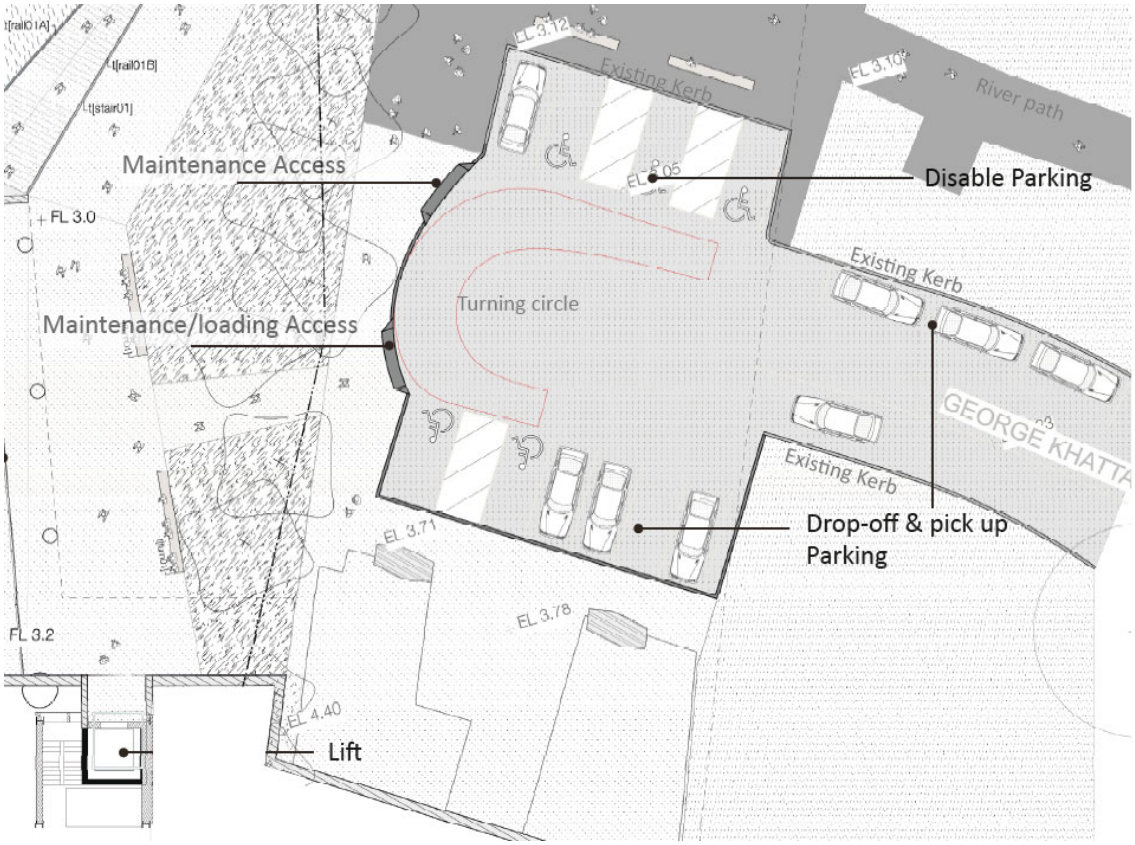


Figure 31 George Khattar Lane concept layout

No areas within the site boundary have been allocated to point to point transport services due to the detrimental impact it would have with respect to pedestrian conflicts within the public domain. A key objective of the proposal is to prioritise pedestrian movements within the precinct and provide for a safe and highly accessible public domain. By providing dedicated drop off and pick up within the site boundary, additional traffic movements would be induced

across the Phillip Street footpath and along Dirrabarri Lane – conflicting with existing and future site users.

The travel demand analysis indicates that, even under a worst-case high utilisation scenario where 10,000 people arrive in a single hour, 100 point to point transport vehicles may be generated. This is equivalent to approximately 2 vehicles arriving every minute. By utilising the future 60m long layby area on the northern side of Phillip Street, up to 10 point to point transport vehicles can be parked at any one time. This supply exceeds the forecast demand under the worst-case scenario, and is therefore considered appropriate to service the site. Other pick up / set down areas across the Parramatta CBD will also be utilised by point to point vehicles, spreading the demand across a number of locations and therefore ensuring there is sufficient capacity to accommodate future users.

5.10 Emergency vehicles

Emergency vehicle access into the precinct, including to the Parramatta River, will be maintained via Dirrabarri Lane. All emergency vehicles will be afforded uninterrupted access along Dirrabarri Lane to the riverfront, or if necessary through the Powerhouse Parramatta site via the public link between the GE building and the western Powerhouse building. Vehicles with a clearance height of less than 3.5m will also have the option of entering the precinct via George Khattar Lane.

5.11 Car parking

The Powerhouse Parramatta does not propose any on-site car parking for staff, residents or visitors, with public transport to be promoted as the primary mode of access to the site. No parking on the site is proposed to maximise the amount of publicly accessible open space and minimise the traffic impacts arising from the development – particularly given the strong public transport links to the Parramatta CBD.

For those that choose to drive to the site, there are a number of public car parks within the Parramatta CBD, with capacity for over 12,000 spaces, which are in close walking distance to the site as previously identified in Section 3.6 of this document.

On a typical weekday it is forecast that approximately 1,250 people will arrive by car. Based on the forecast arrival and departure profile, as well as the average occupancy of 2.4 people per car (as determined from surveys at the current Powerhouse Museum), the number of parked cars associated with the Powerhouse Parramatta can be determined – shown in Figure 32. This indicates that the site may generate parking demand of approximately 140 cars, which can easily be accommodated in nearby off-street car parking areas. As one example, the Parramatta Station car park (capacity 1,160 spaces) is

typically only at 55% occupancy throughout the day, as noted in the draft Parramatta CBD public car parking strategy[1].

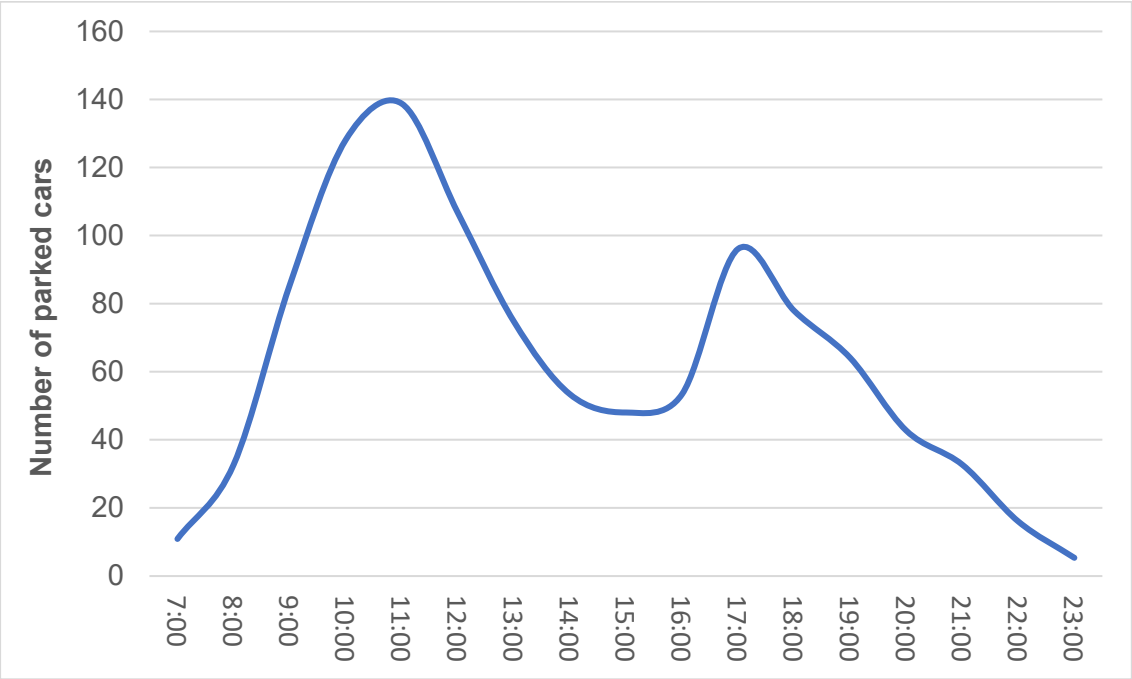


Figure 32 Forecast parking demand – typical weekday

5.12 Road network impacts

The proposal is not expected to generate any impacts on the surrounding road network. On a typical weekday approximately 1,250 people are forecast to arrive to the Powerhouse Parramatta in a private vehicle, equating to approximately 520 vehicles based an occupancy rate of 2.4 people / car. These vehicle trips will be dispersed across a number of public car parking lots in the Parramatta CBD rather than converging on a single location, minimising the road network impacts of the proposal.

As previously noted the existing Riverbank car park generates in the order of 650 vehicles per day – greater than the number forecast by the Powerhouse Parramatta site. While many of these existing vehicle drivers will choose to park in other car parks within the Parramatta CBD, their removal away from the Powerhouse Parramatta site and dispersal across a number of locations will benefit the operation of the road network in the immediate vicinity of the site.

Further, the impacts to the road network as a result of the proposal will be reduced given that vehicles will be arriving and departing constantly throughout the day, rather than vehicle movements being concentrated during the morning and evening peak hours. The travel demand forecasts indicate that the site will only generate 32 vehicle movements in the AM peak hour (8am – 9am) and 90

[1] City of Parramatta Council, April 2017

vehicle movements in the PM peak hour (5pm – 6pm). Given that these small number of vehicles will be dispersed across a number of different vehicle routes and locations, the impacts to the road network arising from the Powerhouse Parramatta are considered negligible.

5.13 Road user safety

Some specific measures with regards to road user safety that the Powerhouse Parramatta proposal has incorporated into the design are as follows:

- The Powerhouse Parramatta design integrates with the future Civic Link connection by providing a 12m wide pedestrianised space between the eastern and western buildings on the site.
- The City of Parramatta Council is proposing to relocate the existing pedestrian (zebra) crossing on Phillip Street to align with the future Civic Link connection and central access way within the site– providing a safe and accessible path for pedestrians across this roadway
- The design has made provision for all back of house (i.e. servicing / loading) activities to be separated from main pedestrian arrival points – minimising conflicts between service vehicles and pedestrians walking in the precinct
- Coach drop off and pick up is to occur on the northern side of Phillip Street rather than within the site. This provides for an improved safety outcome by ensuring pedestrians (especially school children) will not conflict with large service vehicles entering/exiting the loading dock

6 Travel Plan

6.1 Travel plan overview

The development of the Powerhouse Parramatta provides an opportunity to heavily promote the use of sustainable modes of transport as a means of accessing the site and reduce private vehicle dependency. This section outlines the strategies and monitoring mechanisms to reduce the private vehicle impacts arising from the proposed development. These strategies will be further refined as the project progresses.

6.2 Objectives

The main objectives of the travel plan are to reduce the reliance on private vehicles and promoting sustainable means of transport to the Powerhouse Parramatta site. The more specific objectives include:

- High modal share for public transport, cycling and walking journeys for staff, residents and visitors;
- To ensure adequate facilities are provided at the site to enable users to travel by sustainable transport modes
- To raise awareness of sustainable transport amongst users

The travel plan for the Powerhouse Parramatta responds to these objectives by:

- Encouraging alternative travel modes to the car accessible and user friendly, to encourage increased public transport usage;
- Reducing the environmental impact associated with vehicle movements by raising travel awareness and encouraging travel by more sustainable transport modes, to reduce private car usage;
- Connecting the site to the surrounding community by the strong promotion of walking and cycling, thus minimising the impact on the adjacent road network;
- Improving health and wellbeing;
- Promoting public transport connections in the area including bus services, heavy rail connections and the future Parramatta Light Rail service;

6.3 Target mode shares

Having regard for existing travel behaviours (noted in Section 3.1), the planned improvement in public transport services to Parramatta including light rail and metro, as well as the proposal not to provide any car parking for the Powerhouse Parramatta, mode share targets have been developed for travel to the site. These targets are identified in Table 11

Table 11 Target mode shares

Mode of Travel	Target Mode Share	
	Staff / Residents	Visitors
Private vehicle	20%	25%
Public transport, walking or cycling	80%	75%

6.4 Implementation and management

A staff member of the Powerhouse will be responsible for the implementation of the plan, including:

- Communicating the travel plan to stakeholders;
- Promote awareness of the plan and associated initiatives;
- Providing travel information for staff, residents and visitors;
- Developing and disseminating appropriate travel plan marketing information, and to ensure that all relevant and up to date material is provided on the Powerhouse website;
- To liaise with other venues and Government agencies to develop a collaborative approach to Travel Plan initiatives;
- To evaluate the benefit of the proposed measures to identify any changes required to the Travel Plan; and
- Overseeing the implementation and effectiveness of the Plan

In order to secure a successful Travel Plan, the Powerhouse will continue to engage with key transport agencies and stakeholders such as Transport for NSW and City of Parramatta Council. This will assist in designing and operating services which best support the needs of staff, residents and visitors, and therefore promoting high levels of sustainable transport modes.

The Plan is a 'living' document, so measures excluded at this time could be reconsidered or reintroduced at any time in the future. It is recognised that travel needs, and patterns will change, and new measures will become available. The Plan will be periodically reviewed to ensure that the objectives are being met.

6.5 Measures

An overview of the potential measures proposed are described in the following sections. These measures will be refined and confirmed prior to the opening of the Powerhouse Parramatta.

Table 12 lists individual measures, but it should be stressed that implementation of single measures or even a number of measures will not be

as effective as a package of measures. The measures listed are not exhaustive and may change with time, and as a living document the Travel Plan will require the periodic updating of the list of measures.

Table 12 Potential travel plan measures

Measure	Description of measure	Relevant transport mode	Audience		
			Staff	Visitors	Residents
Staff cycle advice	Advice on cycling and walking routes	Cycling/ Walking	✓		
Safety training	Cycle safety training courses (provided by others) for staff to improve cycling confidence.	Cycling	✓		
Staff induction	All event day staff members to be made aware of the travel plan as part of their induction process, including a tour of end of trip facilities on site and available non-car travel options	All modes	✓		
Walking & cycling map	Produce a map showing cycle and walking routes and bicycle parking in the area	Cycling/ Walking	✓	✓	✓
End of trip facilities	Provision of end of trip facilities for staff	Cycling/ Walking	✓		
Bicycle parking	On site cycle parking, the use of these spaces will be monitored and requirements reviewed based on their usage.	Cycling	✓	✓	✓
	Ensure bicycle parking is clearly visible or provide signage to direct people to cycle bays	Cycling	✓	✓	✓
Wayfinding	Provision of improved static wayfinding signage in the precinct to support pedestrian and cyclist movements to/from public transport stops.	Cycling/ Walking	✓	✓	✓
Real time information	Provide information on public transport journey times to the Powerhouse Parramatta via links to existing journey planning websites.	Public Transport	✓	✓	✓
Shift working	Flexible start and finish times for staff, to allow them to take advantage of off-peak fares and encourage public transport use.	Public Transport	✓		
Public transport use	Encourage public transport use for business travel	Public Transport	✓		
Information on website	Information on public transport timetables, pedestrian and cycle routes and facilities. Advertise the parking limitations and restrictions.	All modes	✓	✓	✓
Visitor Information	Provide travel information to visitors via the Powerhouse website, including potentially at point of ticket purchase.	All modes		✓	
Car parking	No on-site parking to be provided as part of the Powerhouse Parramatta		✓	✓	✓

6.6 Monitoring and review

In order for the Travel Plan to be effective it must be monitored on a regular basis (every one to two years). The monitoring measures could include:

- Collecting data on employee travel patterns for journeys to work (through surveys or analysing journey to work or Opal data)
- Visitor travel patterns via interview surveys.
- Review the number of people using public transport in the area through a review of Opal patronage data and counts at the major event bus terminals
- Utilisation of bicycle parking facilities in the precinct.

7 Construction Pedestrian Traffic Management Plan

7.1 Overview

This section details a preliminary Construction Pedestrian and Traffic Management Plan (CPTMP) for the construction of the Powerhouse Parramatta. The purpose of the CPTMP is to assess the proposed access and operation of construction traffic associated with the proposed development with respect to safety and capacity. The Contractor will prepare a more detailed CPTMP with Traffic Control Plans prior to the commencement of works, detailing specific methods of safely managing construction and pedestrian traffic within the surrounding area.

7.2 Description of construction activities

7.2.1 Construction program

It is currently envisaged construction works will commence in early to mid 2021 and take approximately three years to complete. As the project is in its preliminary stages, the following timeframes are approximate and may vary once further details are known. The various stages of construction are noted in Table 13 below.

Table 13 Preliminary construction programme

Activity	Duration
Site Establishment & demolition	2-3 months
Bulk/Detailed Excavation/Piling	4 months
Construction	24 months

7.2.2 Working hours

Work associated with the proposal will be carried out between the following hours of construction:

- Monday to Friday: 7am – 6pm
- Saturday: 8am – 5pm
- Sunday / public holiday: No work

The appointed contractor will be responsible for instructing and controlling all subcontractors regarding the hours of work. Any work outside the approved construction hours would be subject to specific prior approval.

7.2.3 Construction site boundary

The proposed site boundary for the construction works is illustrated in Figure 33 below, and largely encompasses the perimeter of the site. Fencing and hoarding will be installed by the contractor to establish this boundary and ensure appropriate separation of construction works with other users of the precinct.

Figure 33 Construction site boundary

7.2.4 Construction vehicle site access

Three vehicular site access points are proposed to facilitate the construction works as shown in Figure 34. Phillip Street at Dirrabarri Lane and opposite Horwood Place will facilitate the movement of larger construction vehicles, while the existing site access point on George Khattar Lane will also be utilised during the project. Given the vehicle height clearance limit of 3.5m under the Wilde Avenue Bridge, this access point will only service smaller construction vehicles and general deliveries to the site. Traffic controllers will be present at all vehicle crossover points to manage interactions with pedestrians.

Figure 34 Construction vehicle site access points

7.2.5 Construction vehicle types

Vehicles that will access the site during construction will likely mainly comprise of heavy vehicles including Articulated Vehicles (AV) such as precast delivery trucks, truck and dog vehicles for waste removal and Heavy Rigid Vehicles (HRVs) such as concrete trucks. These different types of vehicles may access the site at the same time. Other heavy machinery plants such as cranes will have to be delivered to site in the preliminary stage. All heavy goods such as girders or machinery plants are likely to be delivered outside of peak traffic hours.

7.2.6 Construction traffic routes

The main construction access routes will be via the state road network including the M4 Motorway, James Ruse Drive, Pennant Hills Road and Victoria Road. These routes have been selected to avoid trucks travelling through the Parramatta CBD and impacting adjacent construction projects – particularly Parramatta Light Rail (Stage 1). Church Street is not proposed to be used as a construction access route given the concurrent construction activity that will be occurring for the PLR project. These construction access routes from the broader road network are shown in Figure 35.

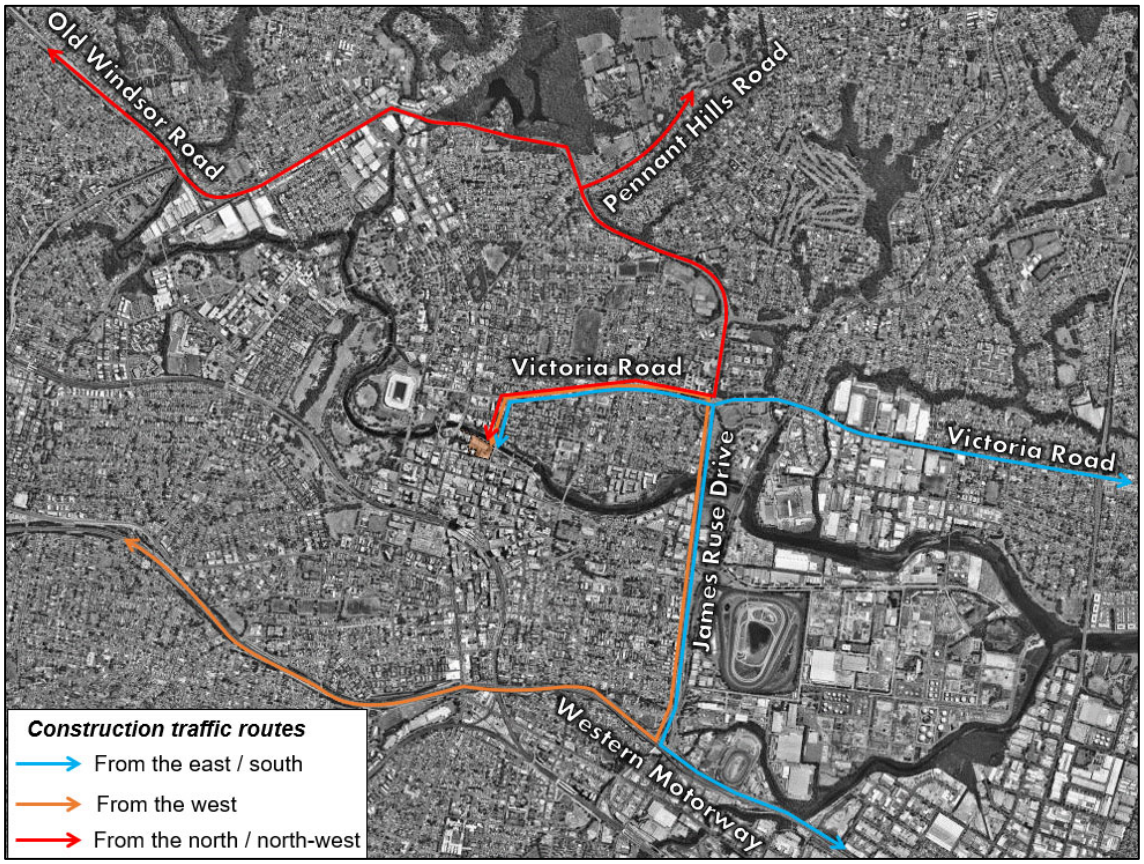


Figure 35 Construction access routes from broader road network

Closer to the Parramatta CBD, construction vehicles will access the site via the Wilde Avenue bridge and turn right onto Phillip Street. Vehicles will then turn right into one of the two access points on Phillip Street, as previously described in Section 7.2.4. Smaller vehicles utilising the access point via George Khattar Lane will travel in a loop around Smith Street, George Street and Charles Street to access the site. Wilde Avenue will form the egress route for all vehicles, via either a left or right turn from Phillip Street.

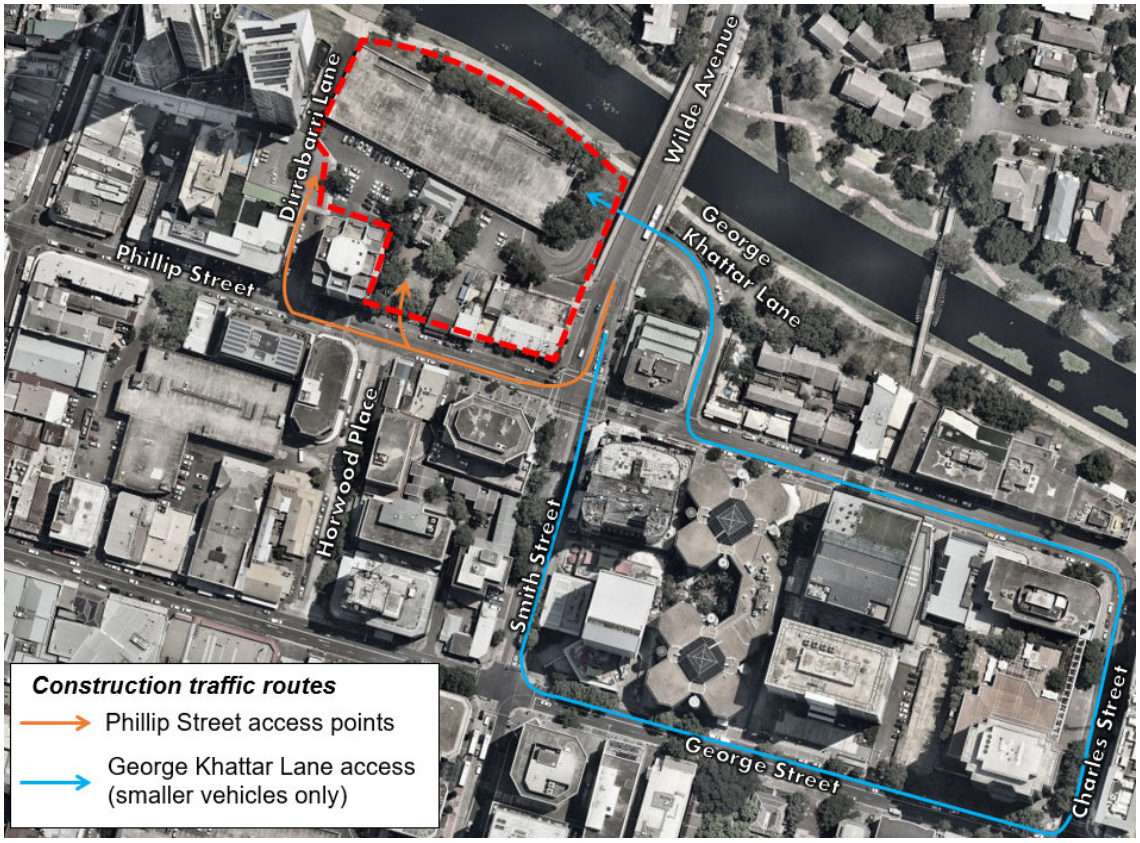


Figure 36 Construction access routes in Parramatta CBD

7.2.7 Construction traffic volumes

Heavy vehicles

The number of daily heavy vehicles accessing the site is forecast to vary from between 40-60 vehicles per day during the demolition phase to 100-120 per day during the peak construction period. This is summarised in Table 14 below.

Table 14 Estimated construction vehicle volumes

Activity	Average weekday traffic generation	Maximum hourly traffic generation
Demolition	40-60 vehicles	8 vehicles
Construction	100-120 vehicles	16 vehicles

The expected profile of truck numbers accessing the site over the course of a weekday is illustrated in Figure 37.

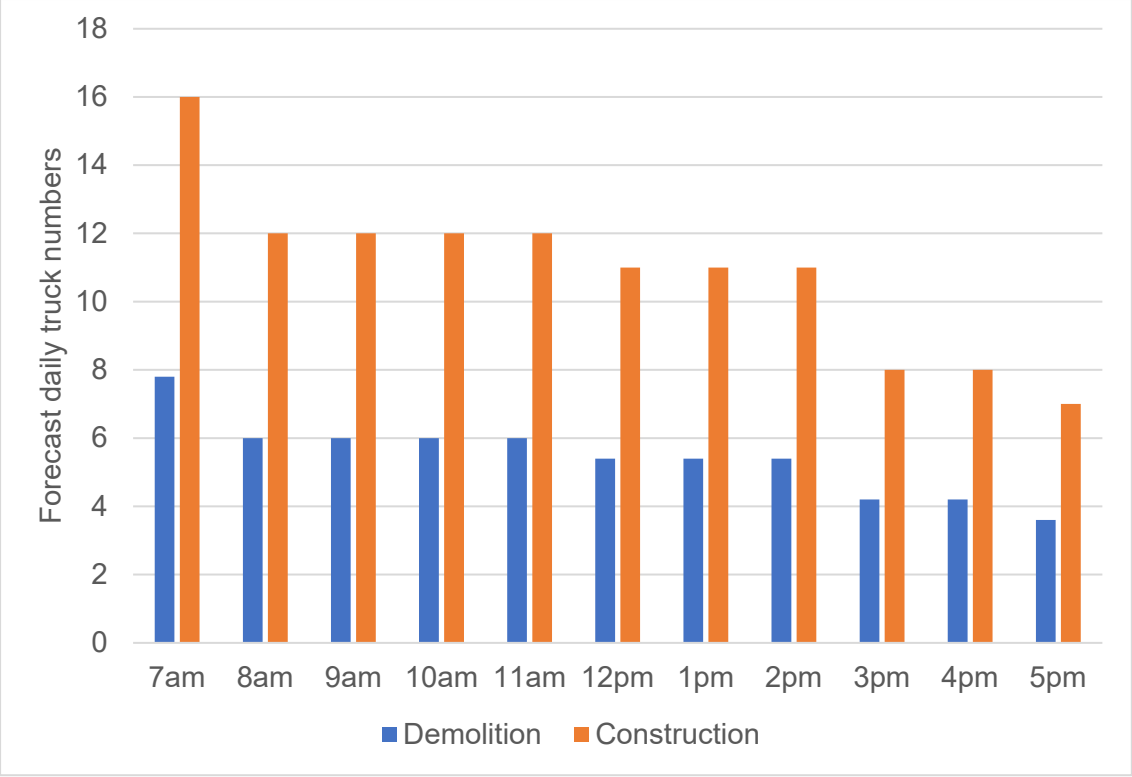


Figure 37 Typical daily profile of truck activity (weekday)

It is important to note that the numbers indicated are indicative only and subject to change on a daily basis. The expected volumes will be updated following the appointment of a contractor to the project.

Light vehicles

Workers will generate some additional traffic to the site. Typically, the demolition phase will have a workforce of only 20 people, with up to 200 people on site during the construction phase. Typically construction workers have a high vehicle occupancy of between 2-3 people per vehicle, however a conservative vehicle occupancy of 1.5 people / car has been assumed for this project. Further, given the site's proximity to nearby public transport services it is expected at least half of workers will arrive by non-car modes, which is considered a conservative assumption.

This would generate approximately 7 vehicles arriving to the site during the demolition phase and 65 vehicles during the construction phase. This level of activity is lower than that currently generated by the Riverbank car park, and is not expected to result in any undue impacts on the surrounding road network. Further, construction workers will need to arrive to the site prior to 7am, therefore not coinciding the morning commuter peak hour.

7.2.8 Work zones

To facilitate the construction project, a work zone is proposed to be established on the northern side of Phillip Street, as shown in Figure 38. The work zone would require the removal of approximately 4 existing on-street parking spaces, which are proposed to be removed regardless following the opening of the Powerhouse Parramatta to facilitate a bus pick up / drop off area. The work zone would be approximately 25m in length and allow for large items to be lifted by cranes positioned within the site.

A B-Class hoarding will be installed adjacent to the work zone to provide protection to pedestrians walking along Phillip Street. The Phillip Street footpath will remain open at all times during the construction period.

Figure 38 Proposed Phillip Street work zone

7.2.9 Parking

No on-site car parking is proposed for construction staff.

7.2.10 Road closures

No road closures are expected to be necessary to facilitate construction, ensuring people driving in the streets around Parramatta are not impacted by the proposed works.

7.3 Assessment of construction activities

7.3.1 Pedestrians and cyclists

Some pedestrians and cyclists within the area may be impacted from walking past the site during construction, particularly along Phillip Street. Traffic controllers with appropriate accreditation will hold construction vehicles at cross-over points and allow pedestrians to cross these work areas.

At this stage it is not envisaged that any footpath closures will be required to facilitate the construction project. Temporary B Class hoardings will be installed along the site frontage on Phillip Street to maintain east-west pedestrian movements and ensure the safety of pedestrians walking adjacent to the construction site.

Along the Parramatta River there may be temporary closures required of the existing pedestrian and cycling path during the construction works. While for the vast majority of the works this pathway will remain open, there will be a short period of time where a closure will be required to facilitate the construction of a new pedestrian/cyclist path within the site boundary. When closures are required, temporary diversions around the construction site will be established so that pedestrians and cyclists can continue their journeys along the southern bank of the Parramatta River at all times.

Further detail regarding additional measures for pedestrians and cyclists will be provided in the detailed Construction Pedestrian Traffic Management Plan, to be developed by the appointed contractor prior to the commencement of works on the site.

7.3.2 Public transport

It is not expected that public transport services would be affected by the works. The small number of additional construction vehicles using public transport corridors such as Wilde Avenue and Victoria Road would not impact the operation of the public transport network in the vicinity of the site. The number of daily vehicles associated with the works will be less than that currently using the Riverbank car park. Construction vehicle arrival and departure routes have been selected in order to avoid interactions with the Parramatta Light Rail (Stage 1) works – therefore not impacting this construction project.

The close proximity of public transport servicing the site via heavy rail and the adjacent bus network will enable construction personnel to easily access the site via public transport, minimising the road traffic impact around the site.

7.3.3 Dirrabarri Lane access

Dirrabarri Lane will remain open at all times to maintain vehicle access to the adjacent GE Building and Meriton apartments. Traffic controllers will manage construction movements on Dirrabarri Lane so that these vehicles do not impact the movement or safety of other users.

7.3.4 Emergency vehicles

Emergency vehicle access will be maintained into the precinct at all times via Dirrabarri Lane.

7.3.5 Road safety

The construction works are not anticipated to impact road user safety for the following reasons:

- The vehicle site access points will be under the control and management of accredited traffic controllers, who will prevent vehicles from leaving the site until it is safe to do so;
- Construction vehicle routes have been selected so as not to coincide with major pedestrian activity areas – specifically away from the heart of the Parramatta CBD;
- The key egress route for vehicles is via the Smith Street / Phillip Street / Wilde Avenue intersection which is controlled by traffic lights which has the capacity to safely manage the movement of vehicles through this location;
- Construction traffic vehicle flows are relatively low – in the order of 110-120 vehicles per day at peak times during the construction project. This is considered minimal in the context of existing traffic movements in the precinct and therefore would not impact road user safety; and
- All footpaths and bicycle paths will remain open and unaffected during the construction period. B-Class hoardings on the northern side of Phillip Street will be established to protect pedestrians walking in an east-west direction.

7.3.6 Car parking

Worker car parking

No on-site car parking is proposed for construction staff, with public transport to be promoted as the primary form of access to the site. For construction workers that choose to drive, they will be afforded with a number of car parking options within the Parramatta CBD. As previously noted a maximum parking demand of 65 cars is expected during the construction period, which in the context of the current supply within Parramatta is considered negligible.

To support construction workers in utilising public transport and reduce dependency on private vehicle as a mode of access to the site, appropriate arrangements will be made for any equipment/ tool storage and drop-off requirements.

Public car parking

To facilitate the proposed work zone on the northern side of Phillip Street, approximately 5 existing on-street car parking spaces will require removal during working hours. There is the potential to reinstate these on-street car

parking spaces outside of normal working hours. It should be noted however that these parking spaces will, following the completion of construction activities, be permanently removed to enable the proposed coach pick up / drop off area.

7.3.7 Cumulative construction activities

The key concurrent construction project in the vicinity of the Powerhouse Parramatta site will be the PLR Stage 1 works. The primary construction vehicle routes in place for the PLR Stage 1 project (as per those identified in the Environmental Impact Statement) are shown in Figure 39 below. This indicates that the primary construction vehicle routes for the PLR project do not overlap with that proposed for the Powerhouse Parramatta site, that being the route via Victoria Road and Wilde Avenue. Although Victoria Road will be used by both construction projects, the number of vehicle movements on this corridor will be relatively low in the context of existing traffic volumes. Therefore the cumulative impacts associated with the PLR Stage 1 project are expected to be minor.

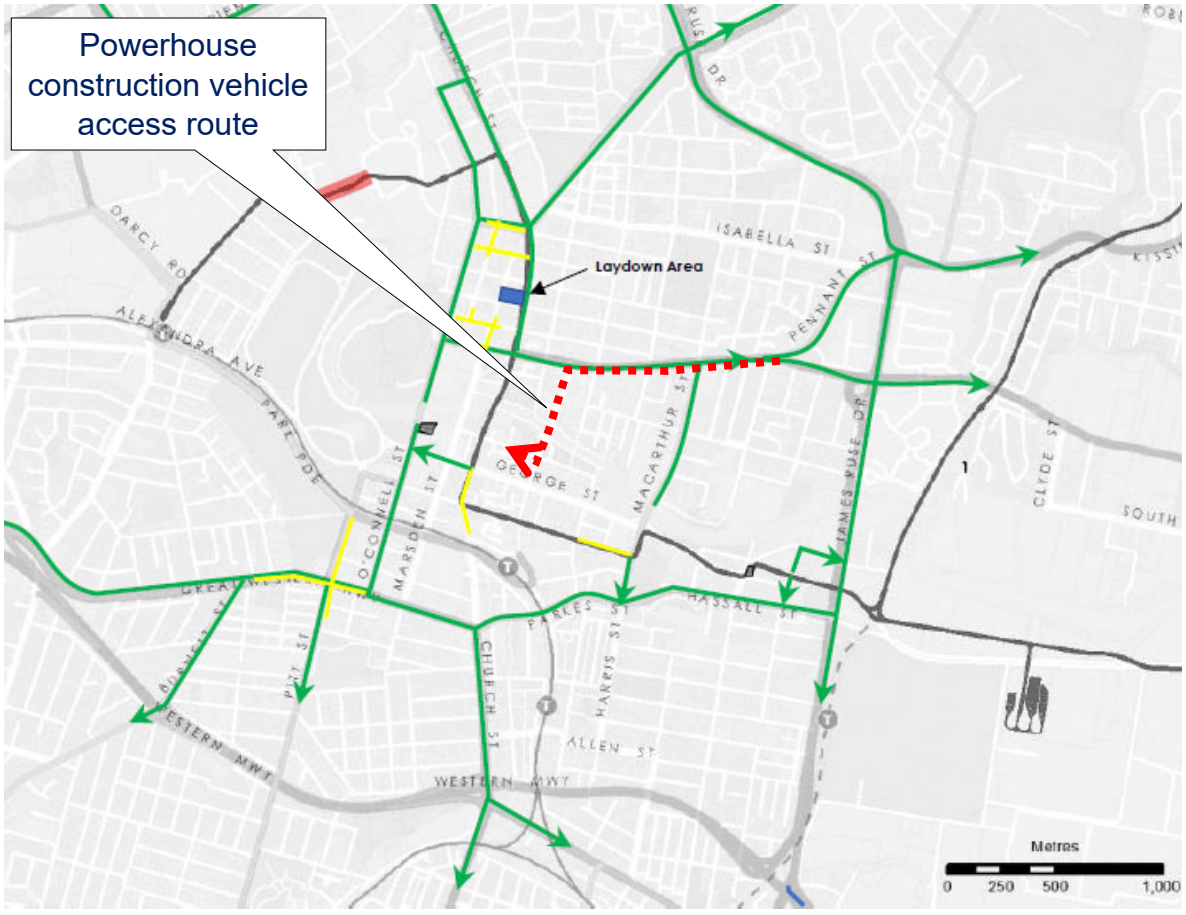


Figure 39 PLR Stage 1 construction traffic routes

Source: Transport for NSW, 2017

The appointed contractor will need to engage in ongoing consultation with key agencies including City of Parramatta Council and Transport for NSW during the construction period to ensure any cumulative impacts with other projects are managed appropriately.

7.3.8 Mitigation measures

Mitigation measures will be adopted during construction to ensure traffic movements have minimal impact on surrounding land uses and the community in general, and would include the following:

- Trucks to not use any local streets for access to the construction site;
- Trucks to enter and exit the site in a forward direction;
- At construction vehicle access/egress points, priority is to be given to trucks accessing the site over trucks egressing the site so as to have no impact to traffic flow on surrounding roads (unless exceptional circumstances do not permit);
- Trucks to not circulate on the road network to wait to enter the site;
- Restrict construction vehicle activity to designated routes which do not utilise any local roads;
- Pedestrian movements adjacent the construction site to be managed and controlled by site personnel where required;
- Pedestrian warning signs and construction safety signs/devices to be utilised in the vicinity of the site and to be provided in accordance with WorkCover requirements;
- Construction activity to be carried out in accordance with approved hours of work;
- Truck loads would be covered during transportation off-site;
- Establishment and enforcement of appropriate on-site vehicle speed limits which would be reviewed depending on weather conditions or safety requirements;
- Activities related to the construction works would not impede traffic flow along adjacent roads;
- During site induction, workers will be informed of the public transport network servicing the site;
- To support construction workers in utilising public transport, appropriate arrangements will be made for any equipment/ tool storage and drop-off requirements; and
- Development and enforcement of driver charter.

7.4 Detailed construction traffic and pedestrian management plan

The Contractor (once appointed) will prepare a more detailed CPTMP prior to the commencement of works on the site. This plan will contain additional information to that presented in this document such as:

- Site compound locations
- Driver facility areas
- Crane locations
- Vehicle turning paths within the site
- Traffic control plans

8 Summary

This transport assessment has been prepared to support the planning application (SSD 10416) for the development of the Powerhouse Parramatta. The new facility will deliver a new cultural institution for Parramatta in the heart of Sydney's Central City. The Powerhouse Parramatta includes:

- seven major public presentation spaces for the exhibition of Powerhouse Collection;
- front and back-of-house spaces;
- studio, co-working and collaboration spaces comprising the 'Powerlab', supported by 30 residences (serviced apartments) for scientists, researchers, students and artists;
- education and community spaces for staff, researchers and the Powerlab residents, the community, and education / commercial hirers;
- commercial kitchen comprising the 'Powerlab Kitchen' used for cultural food programs, research, education and events;
- film, photography, and postproduction studios that will connect communities with industry and content that will interpret the Powerhouse Collection;
- public facing research library and archive for community, industry, students and researchers to access materials; and
- a mix of retail spaces including food and drink tenancies with outdoor dining.

Visitors are generally expected to arrive and depart the site constantly throughout the day, rather than all arriving and departing at the same time. This spread of arrivals and departures reduces the pressure on the transport network by limiting the number of people movements during peak hours of the day. The assessment has confirmed that the transport network supporting the site is capable of accommodating the expected travel demands generated over a typical day as well as for a worst-case utilisation scenario where up to 10,000 people are in the Powerhouse Parramatta precinct.

The proposal includes no on-site car parking bays for private vehicles, with public transport to be promoted as the primary mode of access to the site. For those that choose to drive to the site, there are a number of public car parks within the Parramatta CBD, with capacity for over 12,000 spaces, which are in close walking distance to the site.

The site of the future Powerhouse Parramatta already enjoys good levels of public transport accessibility, which will be further enhanced through the provision of committed infrastructure such as Parramatta Light Rail and Sydney Metro West. A range of travel demand management measures have been proposed to promote travel to the site by non-car modes and take advantage of this high quality public transport infrastructure.

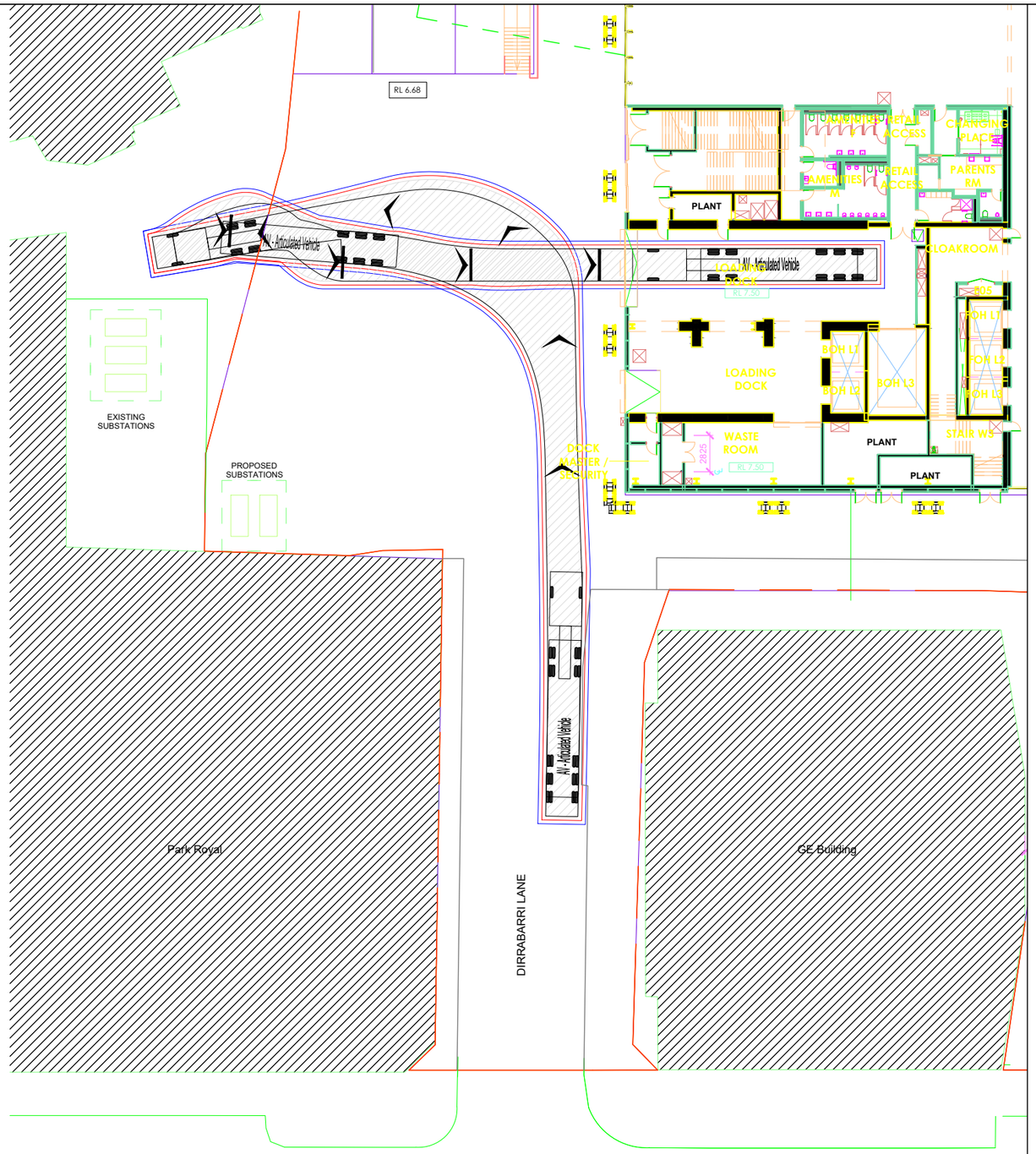
The traffic impacts have been assessed and determined to be acceptable on the access road system. The level of traffic generated by the Powerhouse Parramatta will be comparable to or less than that currently generated by the 500+ space Riverbank car park which currently occupies the site.

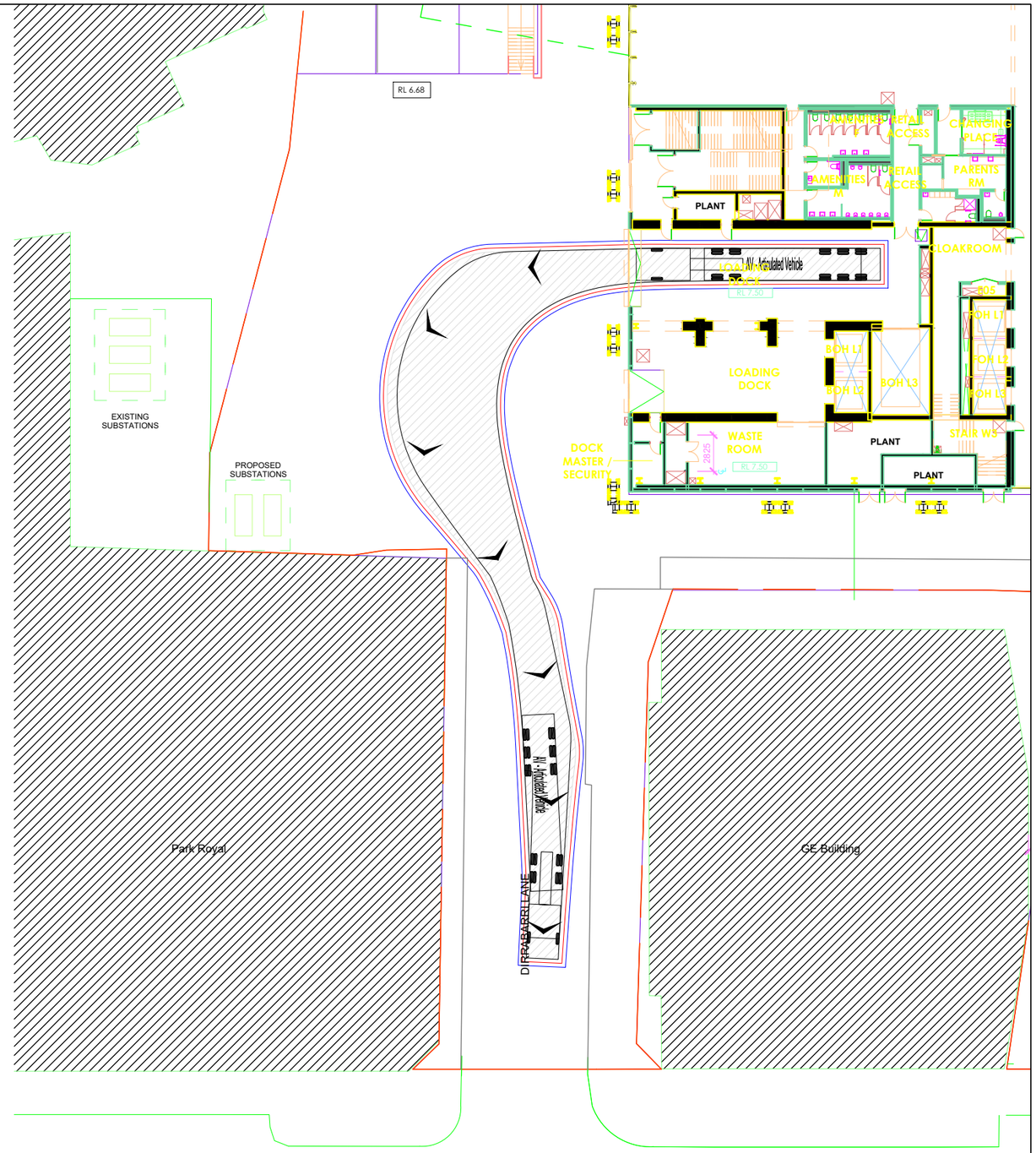
A suite of transport measures has been proposed to support the development of the site and mitigate the impacts on the transport network. These mitigation measures are summarised in Table 15 below.

Table 15 Proposed mitigation measures

Proposed Measure	Timing
Preparation of a detailed Construction Pedestrian Traffic Management Plan (CPTMP) that includes the following: - Detailed construction program - Forecast vehicle movements - Staff transport arrangements - Location of works zones - Location of cranes - Proposed mitigation measures	Prior to commencement of demolition / construction on site
Preparation of a detailed loading dock management plan that includes the following: - Loading dock management details - Service vehicle volumes including size and frequency - Details around incident management at the access to the loading dock; - Management of conflicts between cars accessing the site on Dirrabarri Lane and vehicle movements to/from the loading dock.	Prior to occupation of the site.
Managed drop off and pick up area on the northern side of Phillip Street (between 9am - 3.30pm) to provide coach drop off and pick up	Following occupation of the site
Managed drop off and pick up area on the northern side of Phillip Street (after 3.30pm) to provide for improved access for those arriving by point to point vehicles	Following occupation of the site
No on-site parking for staff or visitors to manage the traffic impacts of the proposal	n/a
Provision of secure bicycle parking at the Powerhouse Parramatta for staff and parking within the public domain for visitors	Following occupation of the site
Provision of good quality pedestrian connections between the Powerhouse Parramatta and public transport such as Parramatta rail/bus interchange, Parramatta Light Rail and Parramatta Ferry Wharf	Following occupation of the site
Preparation of a site specific travel demand management plan, including periodic monitoring of travel behaviour	Following occupation of the site
Maintaining clear access at all times for emergency vehicles using Dirrabarri Lane to access the Parramatta River	During construction and operation

Appendix A: Vehicle Swept Path Analysis





Client
Infrastructure NSW

Job Title
Powerhouse Parramatta

Drawing Title
Turning Paths
19m AV into / out of collections dock

Legend
- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Date
04/09/20

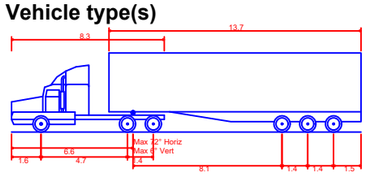
Job No
2006

Drawing No
SKT01

Drawing Status
For SSDA submission

Scale at A3
1:400

Vehicle type(s)



AV - Articulated Vehicle

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock to Lock Time	6.00 sec
Curb to Curb Turning Radius	12.500m

JMT Consulting
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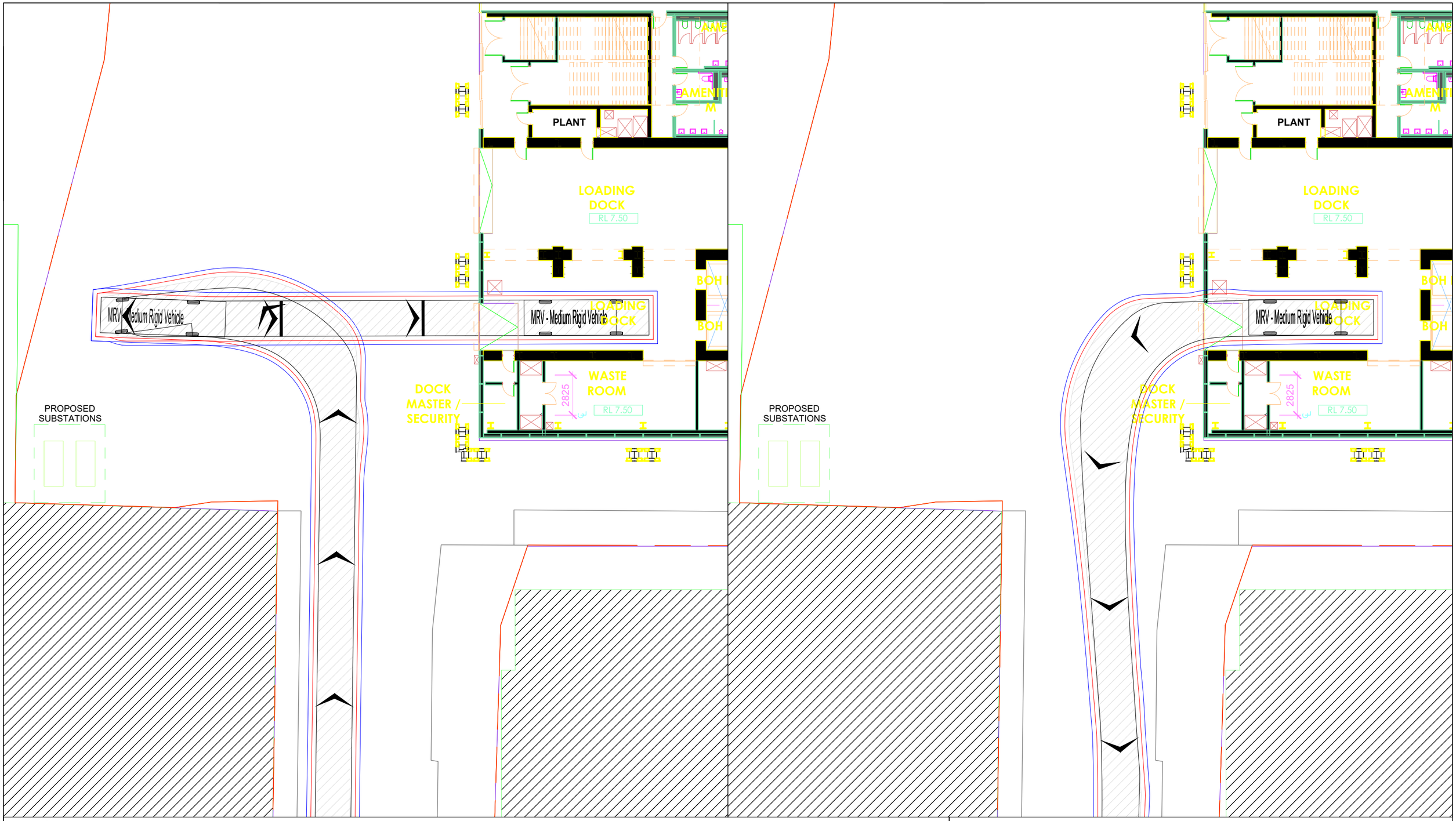


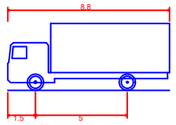
Client
Infrastructure NSW

Job Title
Powerhouse Parramatta

Drawing Title
Turning Paths
Catering / Waste loading dock

Legend
- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Vehicle type(s)



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	10.000m

Date
04/09/20

Job No
2006

Drawing No
SKT02

Drawing Status
For SSDA submission

Scale at A3
1:400

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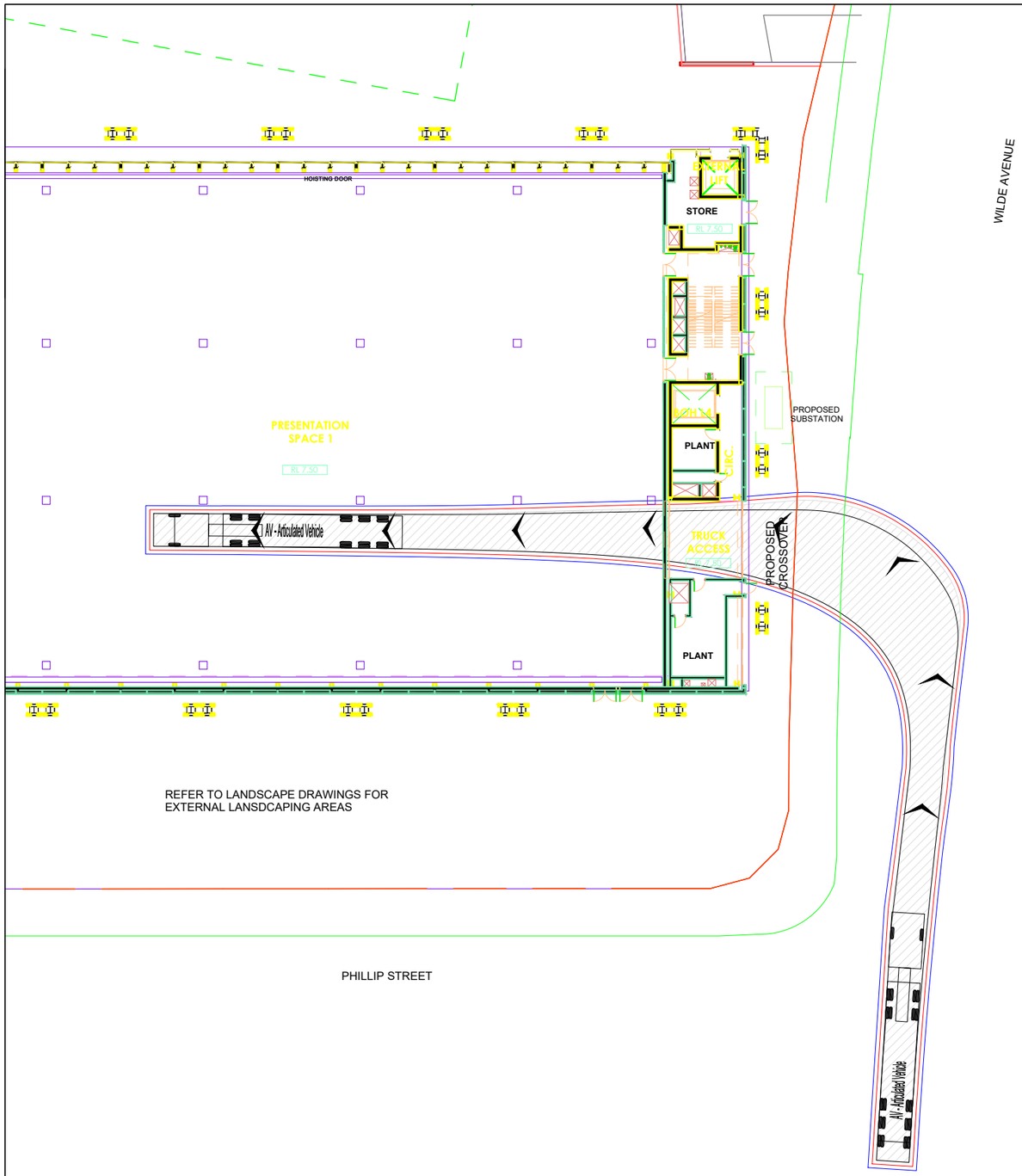
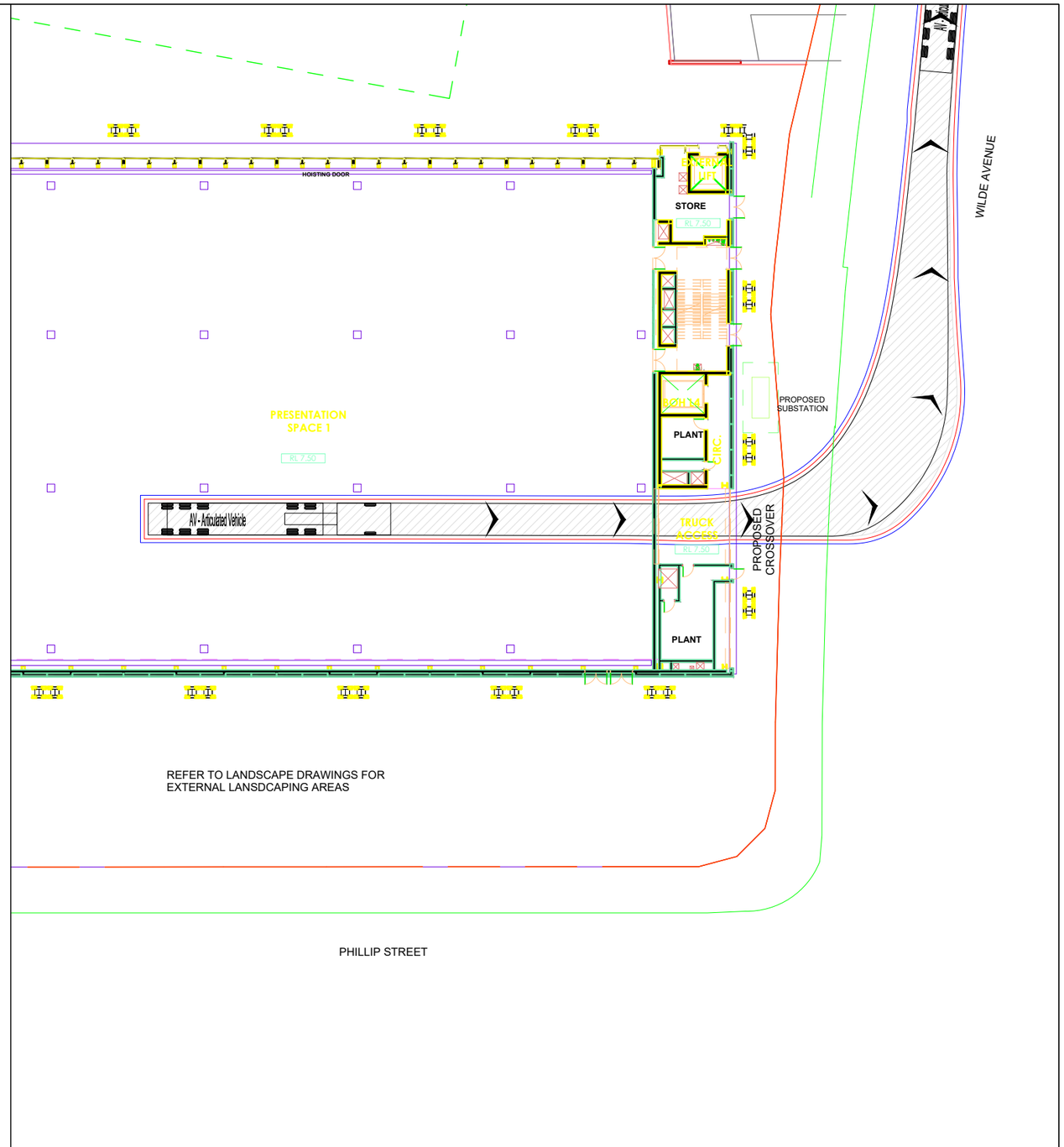




Client
Infrastructure NSW

Job Title
Powerhouse Parramatta

Drawing Title
Turning Paths
19m AV into / out of PS1

Date
04/09/20

Job No
2006

Drawing No
SKT03

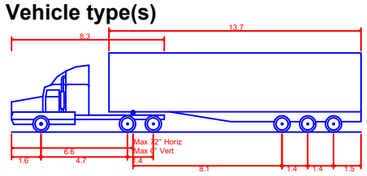
Drawing Status
For SSDA submission

Scale at A3
1:400

Legend

- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Vehicle type(s)



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