Sydney Metro State Significant Development, Development Application (SSD DA) Pitt Street South Over Station Development

Transport and Accessibility Impact Assessment

Pitt Street Developer South Pty Ltd

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Update for Response to Submission

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Contents

Appendices

Appendix A: Service Delivery Plan

1 Executive Summary

Aurecon has been appointed by Pitt Street Developer South Pty Ltd (PS Developer) to undertake a transport and Accessibility Impact Assessment (TAIA) to support a State Significant Development (SSD) Development Application (DA) for Stage 2 design of the mixed use development above the southern portal of Pitt Street Station, otherwise known as the Pitt Street South Over Station Development (South OSD).

This TAIA has assessed the development in accordance with the Secretary's Environmental Assessment Requirements (SEARs) Dated 28 October 2019 that form part of the essential aspects of the Environmental Impact Statement (EIS), addressing transport, traffic, parking and access. A summary of the assessment against each of the SEARs related to transport, traffic and parking is provided in Section 2.1.

The aim of this study was to assess the transport related impacts of the development; Pitt Street South OSD. The development comprises of 234 dwellings, one retail tenancy, residential, tenant and visitor bicycle parking spaces, and four service bays in a dedicated shared loading dock area.

The following summarises the transport impacts of the development:

- **Public Transport:** The site is situated within the centre of Sydney CBD and is accessible (within 400m radius) to high frequency public transport services including buses and trains. With the Pitt Street Metro Station that will be directly beneath the site, it will significantly shorten the travel distance to public transport services for tenants and visitors, with an average service frequency of 3 minutes throughout the day. The recently opened Sydney CBD and South East Light Rail service has one of its stops (Town Hall) within 400m of the development. This will provide another public transport option for the development. Overall, the site is accessible to numerous public transport options and is estimated to be the primary travel mode for most tenants and visitors.
- **Cycling:** According to City of Sydney's Cycleway map, the site is adjacent to Pitt Street and Bathurst Street, that both are classified as "direct routes with higher traffic". These routes are considered to be the most direct route to access major land use in the CBD, and provide connection to other cycling infrastructure. There are numerous public bicycle parking spaces provided within the Sydney CBD, as well as in close proximity to the development. This is estimated to encourage the use of bicycles by tenants of the development for short trips within City of Sydney.
- **Bicycle Parking:** The South OSD will provide 203 bicycle parking spaces comprising of 135 dual bike and storage lockers, 44 vertical bike lockers and 12 visitor bike racks on level 3 and 12 bike storage facilities in the retail zone, which meets Greenstar requirements. Additionally, there will be 10 off-street bicycle spaces on the south of Bathurst Street, adjacent to the site, to be shared among the development and the public.
- **Pedestrians:** Assessment of the Pedestrian access to the South OSD Development has been undertaken as part of the Pitt Street Metro Station Development Application which formed part of the Critical State Significant Infrastructure (CSSI) submission. The dynamic pedestrian modelling integrated the metro station, the precinct and both the North and South OSD development. The report has concluded that the pedestrian level of service is generally satisfactory.
- **Private Vehicle Provision:** The development will not provide any parking provision for the tenants and visitors. The demand can be accommodated by the on-street parking spaces and a number of public car parks in the vicinity (within 400m), with an approximately 3,700 parking spaces available for the site. It is identified that there are some public car parks operate 24 hours, providing approximately 1,400 parking spaces. However, the needs on the private vehicle will be occasional for the site, it can utilise the businesses available within Sydney CBD such as car share and car rental. They are accessible via walking (within 400m) and public transport (more than 400m) from the site.
- **Traffic:** The development is estimated to generate approximately 16 – 24 vehicle trips during the road network peak periods. With this minimal number of trips, the development is unlikely to have any material impact on the adjacent road network.
- **Loading Dock Provision and Operation:** The South OSD development will provide four loading dock spaces and will be managed by a loading dock manager through a booking system. An assessment was undertaken to review the additional spaces to meet Sydney DCP 2012 and it was determined the

proposed design provides for sufficient capacity to meet the maximum typical demand for the proposed land use of 8 vehicles during the peak hour. The development has also been designed to accommodate the estimated peak demand within the shared loading dock and not be reliant on, on-street parking as part of the day to day operations for the Station and OSD tenants. While there are existing loading zone spaces available on the surrounding road network in close proximity to the site, the need to use the existing on-street facilities is expected to be rare.

2 Purpose of this Report

2.1 Alignment with the SEARs and SSD 8876

2.1.1 SEARs

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARS) Dated 28 October 2019. Specifically, this report has been prepared to respond to the SEARS requirements summarised in Table 2-1 below.

Table 2-1: SEARs requirements

Item	Description of Requirement	Report Section	Comments
8a - Traffic, parking and access (operation)	Details on the current and likely estimated future mode share for the various users (residents, visitors, etc) accessing the proposed development	5.1 and the Green Travel Plan document: SMCSWSPS-AUR-OSS-PL-REP-000002	The assessment has been based on existing transport mode share for the City of Sydney, in order to estimate the expected mode share for the development, considering the existing and future infrastructure in close proximity to the site, as well as the proposed future transport facilities. The Green Travel Plan is provided as part of SMCSWSPS-AUR-OSS-PL-REP-000002.
8b	Details of the current and likely estimated future daily and peak hour vehicle, public transport, point to point transport, pedestrian and bicycle movements to/from the site, including an indication of whether it relates to the station or OSD, and any associated impacts and/or mitigation measures required	3 and 5	The assessment provides a review of potential traffic generation from the development to determine the likely impact on the road network in the vicinity. Traffic generation is limited as a result of no parking provision within the development, which is in line with City of Sydney's objectives.
8c	Measures to encourage users of the development to make sustainable travel choices, including a green travel plan, walking, cycling, public transport and car sharing, adequate provision of bicycle parking and end of trip facilities and the minimisation of private car trips	3, 4, 5 and the Green Travel Plan document: SMCSWSPS-AUR-OSS-PL-REP-000002 alongside the Pedestrian Modelling report submitted as part of the Pitt Street Station SSDA: SMCSWSPS-AUR-ALL-TF-REP-000001	The assessment focuses on the accessibility to sustainable transport options available for the development. The Green Travel Plan has been provided in SMCSWSPS-AUR-OSS-PL-REP-000002. The Pedestrian Modelling report submitted as part of the Pitt Street Station SSDA: SMCSWSPS-AUR-ALL-TF-REP-000001.

Item	Description of Requirement	Report Section	Comments
8d	Modelling and analysis of pedestrian and cyclist access to the proposed development in consultation with TfNSW, taking into account the existing and planned Sydney Bike Network	3.7.5, 5.3 and 5.5 alongside the Green Travel Plan document: SMCSWSPS-AUR-OSS-PL-REP-000002 and the Pedestrian Modelling report submitted as part of the Pitt Street Station SSDA: SMCSWSPS-AUR-ALL-TF-REP-000001.	The assessment has provided a review of the pedestrian analysis undertaken for the Pitt Street Metro Station, with development included. The Green Travel Plan has been provided in SMCSWSPS-AUR-OSS-PL-REP-000002. The Pedestrian Modelling report was submitted as part of the Pitt Street Station SSDA: SMCSWSPS-AUR-ALL-TF-REP-000001.
8e	An assessment and details of existing and proposed vehicle access arrangements, including vehicle parking and access, a Delivery Service Plan detailing loading dock and servicing provision, adequacy and management with consideration of precinct wide shared loading docks and/or remote or off-site loading zone hub facilities, ensuring all servicing and loading occurs on-site and does not rely on kerbside controls	3.4, 4.4, 5.2, 5.8 and Appendix A.	The assessment for the loading bays has been reviewed against the City of Sydney DCP 2012, as well as a loading dock activity study to support the loading bay provision at peak. The development has been designed to accommodate the estimated peak demand within the shared loading dock and not be reliant on, on- street parking as part of the day to day operations for the Station and OSD tenants A Delivery Service Plan has been included in Appendix A.
8f	Details of measures to segregate hostile vehicles from public transport users and areas of people congregation	N/A	Refer to Blast Vulnerability Assessment prepared by K&C and Security Risk Assessment prepared by Integral for further information.
8g	An assessment of pedestrian and cyclist safety with consideration of the relationship with design, access and operation of the station.	4.2 and 5.9	An assessment has been undertaken reviewing any potential risks for pedestrians and cyclists with respect to the development's access, design and operation.

Conditions of Consent

This report has also been prepared in response to the following Condition of Consent for the State Significant Development Concept (SSD 8876) for the OSD summarised in Table 2-2.

Table 2-2: Concept approval of Conditions of Consent

Item	Description of Requirement	Section Reference	Comments
B16/17 Traffic, Access and parking	Traffic and Transport Impact Assessment including: Consideration of responsibilities, timing and commitments to the development of car share parking, motorcycle parking and preparation of travel plans	Whole document.	This document is the Traffic and Transport Impact Assessment as undertaken for OSD South.
B18 Traffic, Access and parking	Independent road safety audits are to be undertaken for all stages of detailed design development involving road operations and traffic issues relevant to the OSD. Any issues identified by the audits shall be closed out in consultation with the Sydney Coordination Office and the City of Sydney to the satisfaction of the relevant road authorities.		This will be undertaken as part of the design process, septate to this report. This will be undertaken based on the latest design at the commencement of the next design phase.

2.2 Introduction

This report has been prepared to accompany a detailed State Significant Development (SSD) development application (DA) for a residential Over Station Development (OSD) above the new Sydney Metro Pitt Street South Station. The detailed SSD DA is consistent with the Concept Approval (SSD 17_8876) granted for the maximum building envelope on the site, as proposed to be modified.

The Minister for Planning, or their delegate, is the consent authority for the SSD DA and this application is lodged with the NSW Department of Planning, Industry and Environment (NSW DPIE) for assessment. This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 28 October 2019.

The detailed SSD DA seeks development consent for the construction and operation of:

- New residential tower with a maximum building height of RL 165.15, including residential accommodation and podium retail premises, excluding station floor space
- Use of spaces within the CSSI 'metro box' building envelope for the purposes of:
  - Retail tenancies;
  - Residential communal facilities, residential storage, bicycle parking, and operational back of house uses
  - Shared vehicle loading and service facilities on the ground floor
  - Landscaping
  - Utilities and services provision.
  - Stratum subdivision (Station/OSD).
- Integration with the approved CSSI proposal including though not limited to:
  - Structures, mechanical and electronic systems, and services; and
  - Vertical transfers;

2.3 The Site

The site is located within the Sydney CBD, on the corner of Bathurst Street and Pitt Street. It has two separate street frontages, Pitt Street to the west and Bathurst Street to the north. The area surrounding the site consists of predominantly residential high-density buildings and some commercial buildings, with finer grain and heritage buildings dispersed throughout.

The site has an approximate area of 1,710 sqm and is now known as Lot 10 in DP 1255507. The street address is 125 Bathurst Street, Sydney as shown in Figure 2-1.

Figure 2-1: Location Plan

2.4 Sydney Metro

Sydney Metro is Australia's biggest public transport program. A new standalone railway, this 21st century network will revolutionise the way Sydney travels.

There are four core components:

- **Sydney Metro Northwest (formerly the 36km North West Rail Link)**

This project is now complete and passenger services commenced in May 2019 between Rouse Hill and Chatswood, with a metro train every four minutes in the peak. The project was delivered on time and $1 billion under budget.

- **Sydney Metro City & Southwest**

Sydney Metro City & Southwest project includes a new 30km metro line extending metro rail from the end of Metro Northwest at Chatswood, under Sydney Harbour, through new CBD stations and southwest to Bankstown. It is due to open in 2024 with the ultimate capacity to run a metro train every two minutes each way through the centre of Sydney.

Sydney Metro City & Southwest will deliver new metro stations at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street, Waterloo and new underground metro platforms at Central Station. In addition it will upgrade and convert all 11 stations between Sydenham and Bankstown to metro standards.

In 2024, customers will benefit from a new fully-air conditioned Sydney Metro train every four minutes in the peak in each direction with lifts, level platforms and platform screen doors for safety, accessibility and increased security.

- **Sydney Metro West**

Sydney Metro West is a new underground railway connecting Greater Parramatta and the Sydney CBD. This once-in-a-century infrastructure investment will transform Sydney for generations to come, doubling rail capacity between these two areas, linking new communities to rail services and supporting employment growth and housing supply between the two CBDs.

The locations of seven proposed metro stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays.

The NSW Government is assessing an optional station at Pyrmont and further planning is underway to determine the location of a new metro station in the Sydney CBD.

- **Sydney Metro Western Sydney Airport**

Metro rail will also service Greater Western Sydney and the new Western Sydney International (Nancy Bird Walton) Airport. The new railway line will become the transport spine for the Western Parkland City's growth for generations to come, connecting communities and travellers with the rest of Sydney's public transport system with a fast, safe and easy metro service. The Australian and NSW governments are equal partners in the delivery of this new railway.

The Sydney Metro Project is illustrated in Figure 2-2.

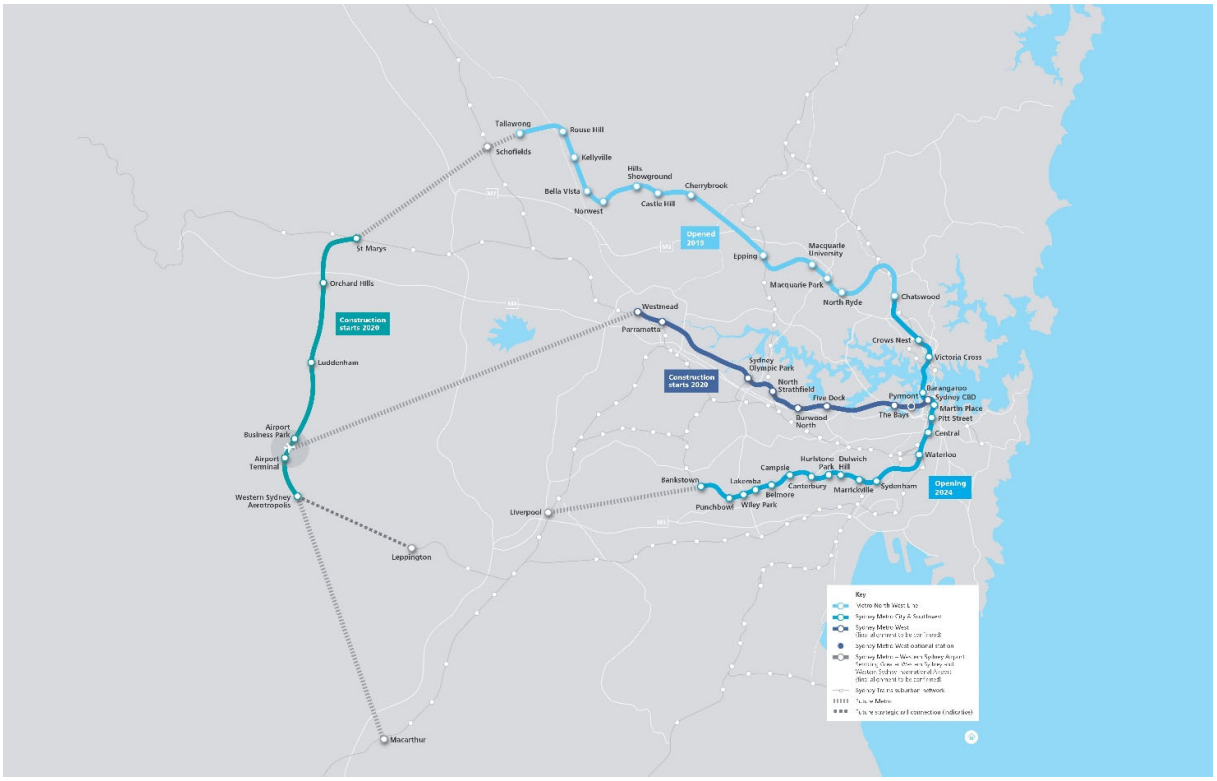


Figure 2-2: Sydney Metro Alignment Map (source: Sydney Metro)

On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham project as a Critical State Significant Infrastructure project (reference SSI 15_7400) (CSSI Approval). The terms of the CSSI Approval includes all works required to construct the Sydney Metro Pitt Street Station, including the demolition of existing buildings and structures on both sites (North and South). The CSSI Approval also includes construction of below and above ground works within the metro station structure for appropriate integration with Over Station Developments.

The CSSI Approval included Indicative Interface Drawings for the below and above ground works at Pitt Street South Metro Station site. The delineation between the approved Sydney Metro works, generally described as within the "metro box", and the Over Station Development (OSD) elements are illustrated in Figure 2-3 and Figure 2-4. The delineation line between the CSSI Approved works and the OSD envelope is generally described below or above the transfer slab level respectively.

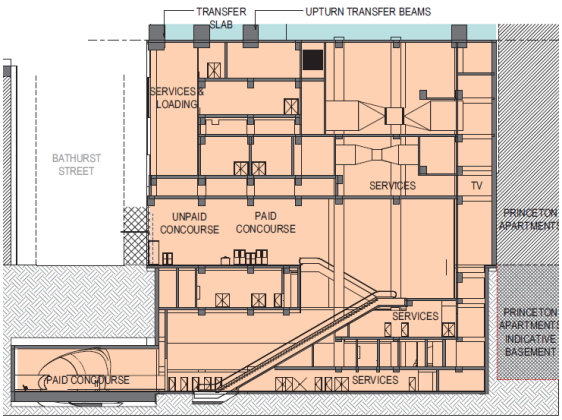


Figure 2-3: Pitt Street Station (North-South Section)

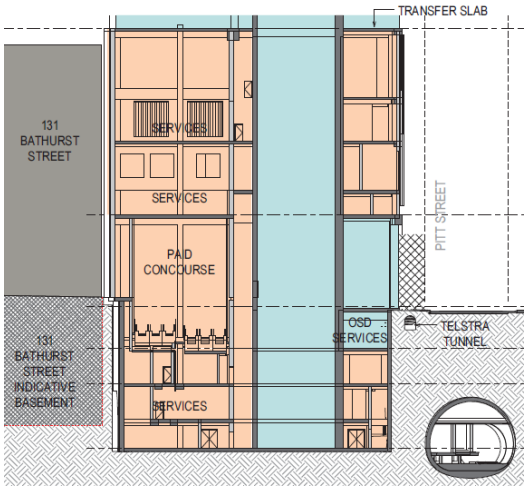
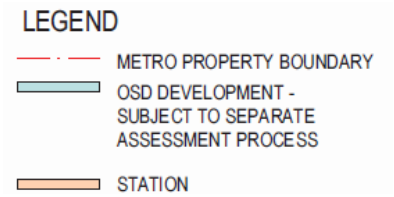


Figure 2-4: Pitt Street Station (East-West Section)



Source: CSSI Preferred Infrastructure Report (TfNSW)

The Preferred Infrastructure Report (PIR) noted that the integration of the OSD elements and the metro station elements would be subject to the design resolution process, noting that the detailed design of the "metro box" may vary from the concept design assessed within the planning approval. As such in summary:

- The CSSI Approval provides consent for the construction of all structures within the approved "metro box" envelope for Pitt Street South.
- The CSSI Approval provides consent for the fit out and use of all areas within the approved "metro box" envelope that relate to the ongoing use and operation of the Sydney Metro.
- The CSSI Approval provides consent for the embellishment of the public domain, and the architectural design of the "metro box" envelope as it relates to the approved Sydney Metro and the approved Pitt Street South Station Design & Precinct Plan.
- Separate development consent however is required to be issued by the NSW DPIE for the use and fit-out of space within the "metro box" envelope for areas related to the OSD, and notably the construction and use of the OSD itself.

As per the requirements of clause 7.20 of the *Sydney Local Environmental Plan 2012*, as the OSD exceeds a height of 55 metres above ground level (among other triggers), development consent is first required to be issued in a Concept (formerly known as Stage 1) DA. This is described below.

2.5 Pitt Street South Over Station Development (OSD)

Development consent was granted on 25 June 2019 for the Concept Development Application (SSD 8876) for Pitt Street South OSD including:

- A maximum building envelope, including street wall and setbacks for the over station development.
- A maximum building height of RL171.6.
- Podium level car parking for a maximum of 34 parking spaces.

- Conceptual land use for either one of a residential or commercial scheme (not both). NO maximum Gross Floor Area was approved as part of SSD 8876.

The building envelope approved within the Concept SSD DA provides a numeric delineation between the CSSI Approval “metro box” envelope and the OSD building envelope. As illustrated in Figure 2-5, Figure 2-6 and Figure 2-7 below, the delineation line between the two projects is defined at RL 58.25 (Level 7).

For the purposes of the Detailed (Stage 2) SSD DA, it is noted that while there are two separate planning applications that apply to the site (CCSI and SSD DA), SMCSWSPS-AUR-OSS-PL-REP-000001 the full development across the site to provide contextual assessment.

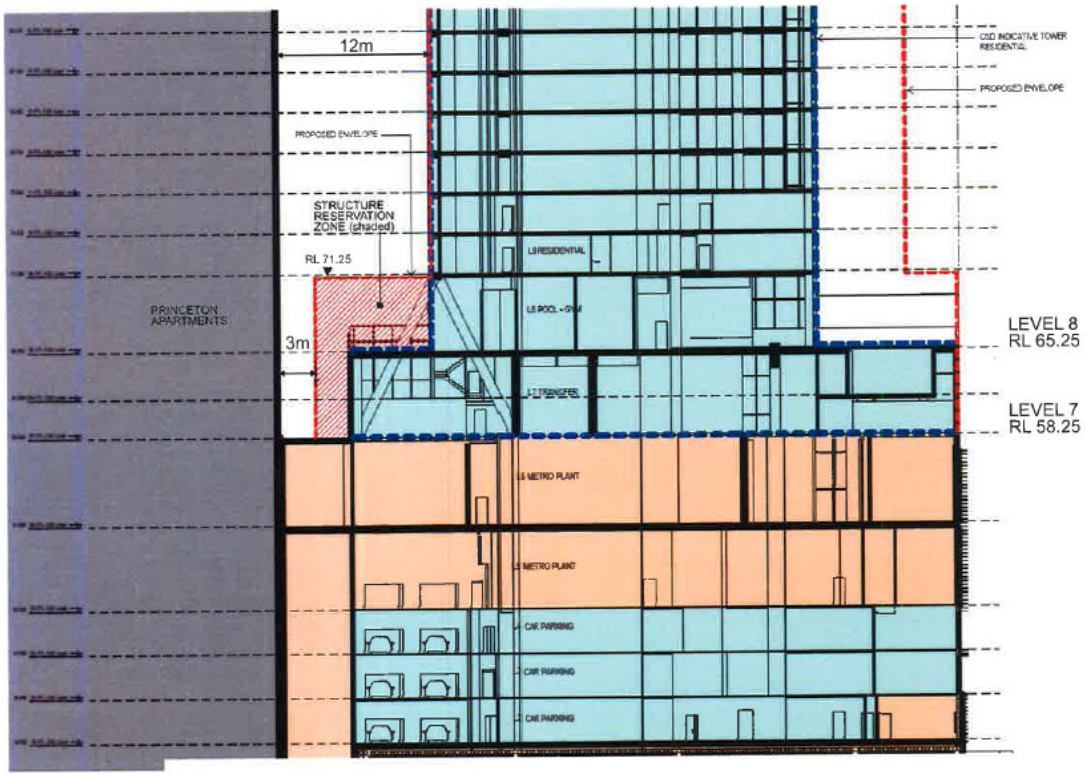


Figure 2-5: Pitt Street South Concept SSD DA – Building Section (*Source: SSD 8876 Concept Stamped Plans)*

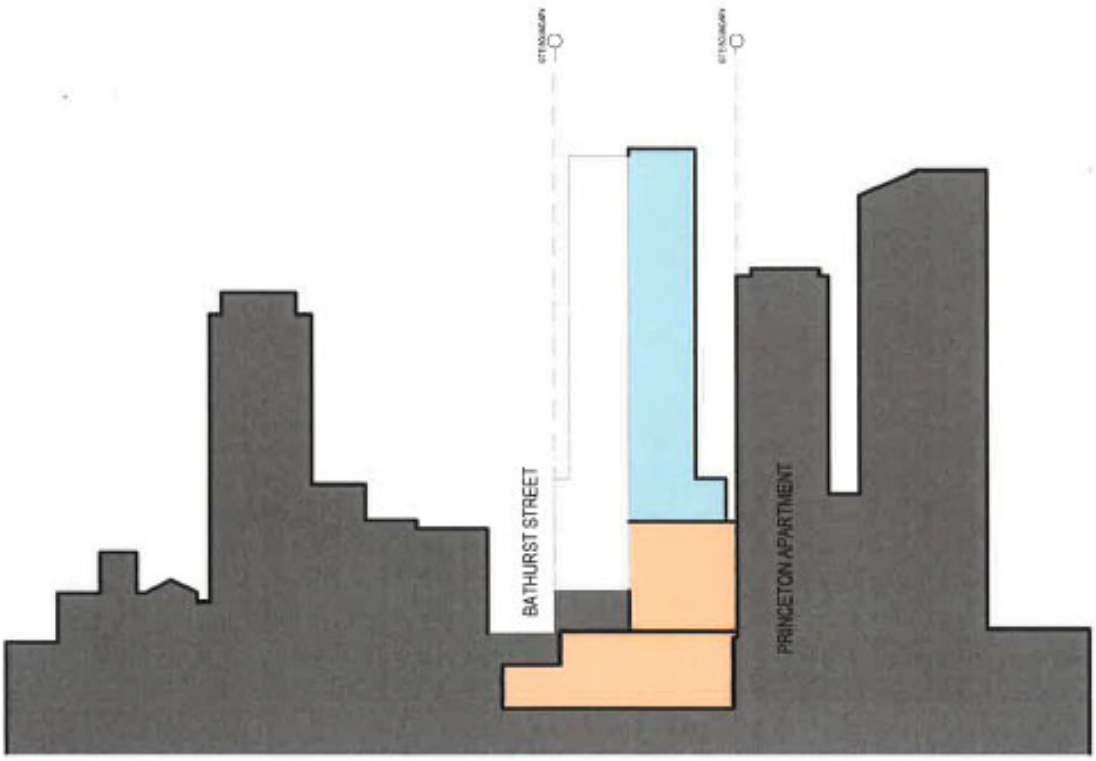


Figure 2-6: Pitt Street South Concept SSD DA – North South Section (*Source: SSD 8876 Concept Stamped Plans)*

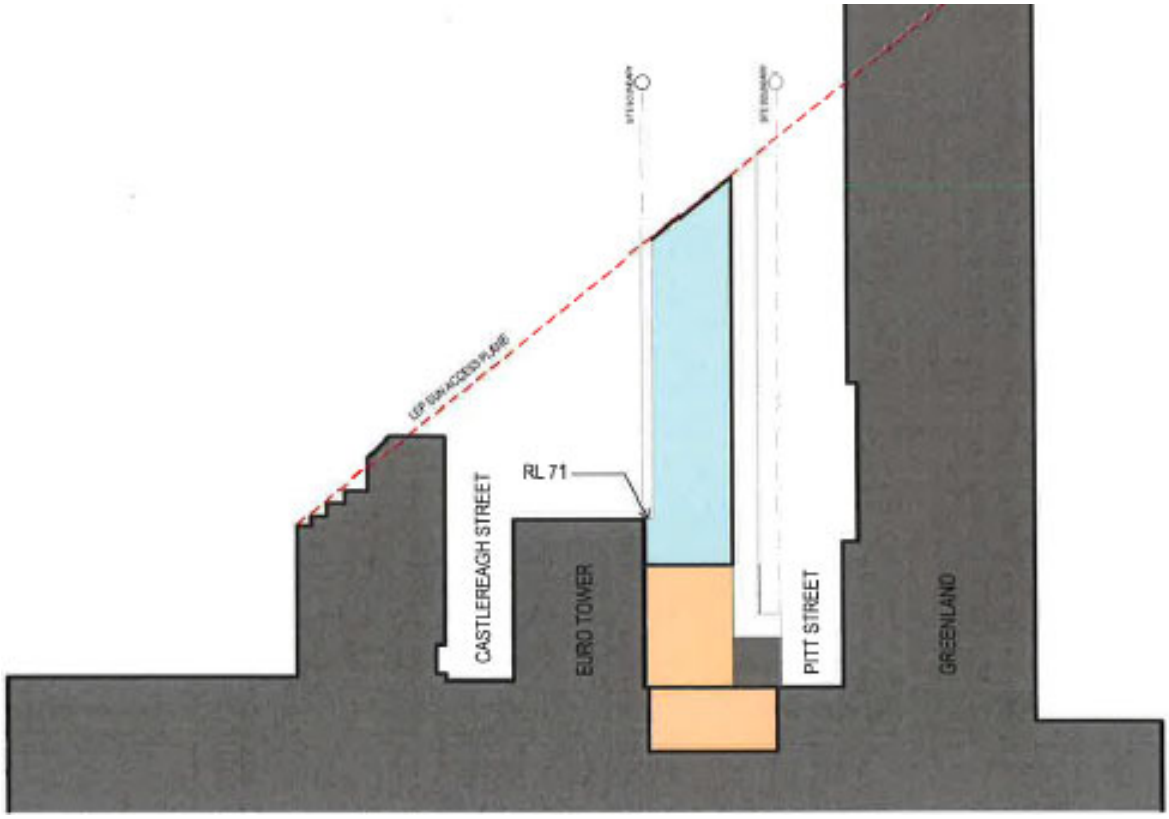


Figure 2-7: Pitt Street South Concept SSD DA – East West Section (*Source: SSD 8876 Concept Stamped Plans)*

2.6 Study Assumptions and Limitations

The assessment is based on the following assumptions and limitations:

- The previous TTIA prepared for the site concept design as part of the SSD application, "*Appendix T: Sydney Metro City & Southwest Pitt Street South Over Station Development – Transport and Traffic Impact Assessment Report*" dated August 2018 has been used as the main reference for this TAIA to ensure the consistency of adopted methodology and analysis approach. It is assumed the data and assumptions remain valid and representative.
- RMS Traffic Generating Guideline – The traffic generation rates recommended in the RMS Guide to Traffic Generating Developments (2002) and the more recent RMS Technical Direction 2013/04a: Guide to Traffic Generating Developments – Updated Traffic Surveys (RMS, 2013) have been used to determine baseline traffic generation rates for the existing site.
- The land uses are consistent with the detail provided in the DA application for the Pitt Street station and include consideration of the land uses in the CSSI Approval (including station retail).
- The assessment is based on an existing situation and full development of the site as an integrated station development and is limited by the data obtained and identified in this report.
- The Pitt Street North Dock Activity Assessment undertaken by Sydney Coordination Office Planning and Freight has been used to forecast the potential vehicle service profile for the development.
- The journey to work data sourced from the Australia Bureau Statistics 2016 is representative for the current transport mode trend.
- The pedestrian impact analysis is based on the study undertaken by METRON for Sydney Metro as detailed in the "*Pedestrian Modelling Report – Precinct, Pitt Street Station*" dated May 2018.

3 Existing Situation

Chapter 3 discusses the existing situation with regards to access and transport network surrounding the development.

3.1 Surrounding Road Network Characteristics

The site is currently surrounded by collector roads and local streets. The characteristics of the surrounding roads are summarised below:

- **Pitt Street**

Pitt Street is a one-way northbound road with segments of two and three traffic lanes between Bathurst Street and Liverpool Street, aligned in a north-south direction. It is classified as a local road and has a posted speed limit of 40km/hr. With reference to Figure 3-1, along the western side of Pitt Street on-street paid parking is available, for up to four hours. On-street parking is also available on the eastern side of Pitt Street, including 4 hour paid parking, loading and mail zones.

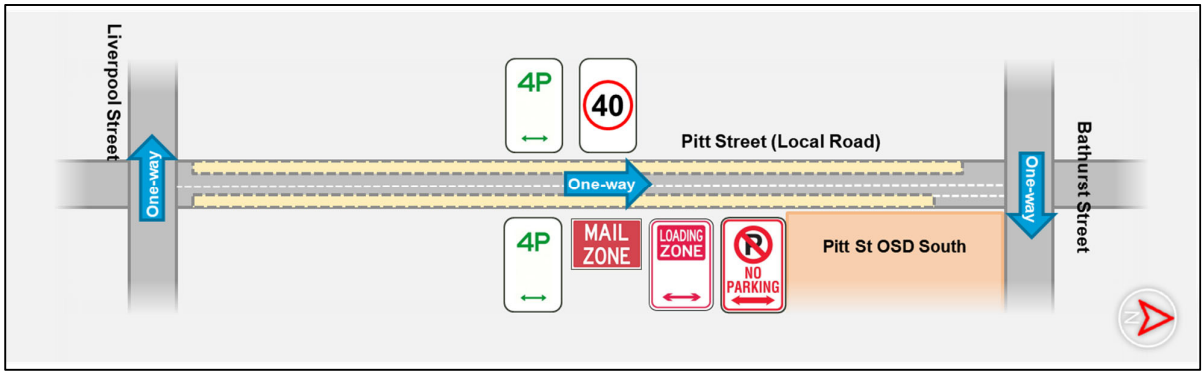


Figure 3-1: Pitt Street Road Characteristics

- **Bathurst Street**

Bathurst Street is a one-way eastbound road with segments of two and three traffic lanes between Pitt Street and Castlereagh Street. It is classified as a regional road and has a posted speed limit of 40km/hr. With reference to Figure 3-2, on-street paid parking (limited to 4 hours) is available along both sides of Bathurst Street, with some of the spaces are clearway restricted (6am-6pm). Some of the on-street parking spaces are also restricted for loading zones only during weekdays (7am-6pm) and Saturday (7am-10am).

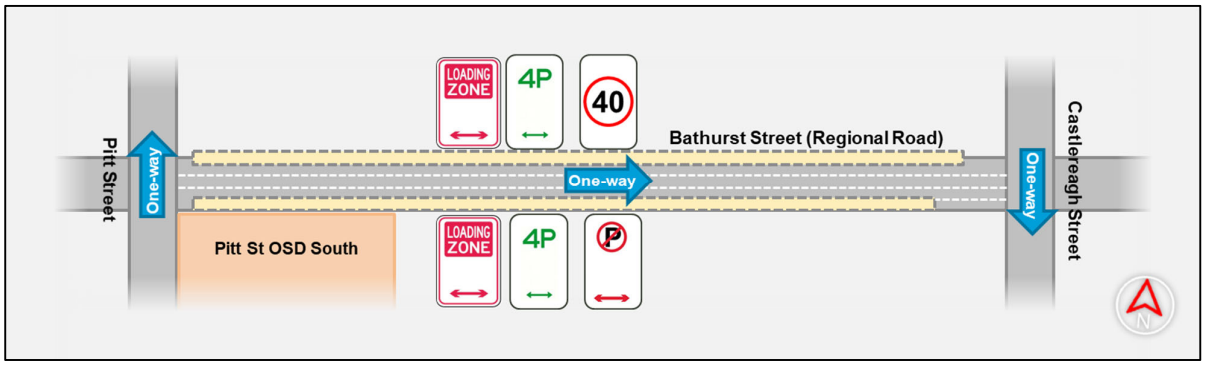


Figure 3-2: Bathurst Street Road Characteristics

- **Castlereagh Street**

Castlereagh Street is a one-way southbound road, and generally incorporates one or two traffic lanes, a bus lane and an emergency lane between Liverpool Street and Bathurst Street. It is classified as a local road and has a posted speed limit of 40km/hr. With reference to Figure 3-3, on-street paid parking (limited to 4 hours) is available along both sides of Castlereagh Street, while some of the spaces are also restricted to loading zones only during weekdays (6am-6pm) and Saturdays (7am-10am).

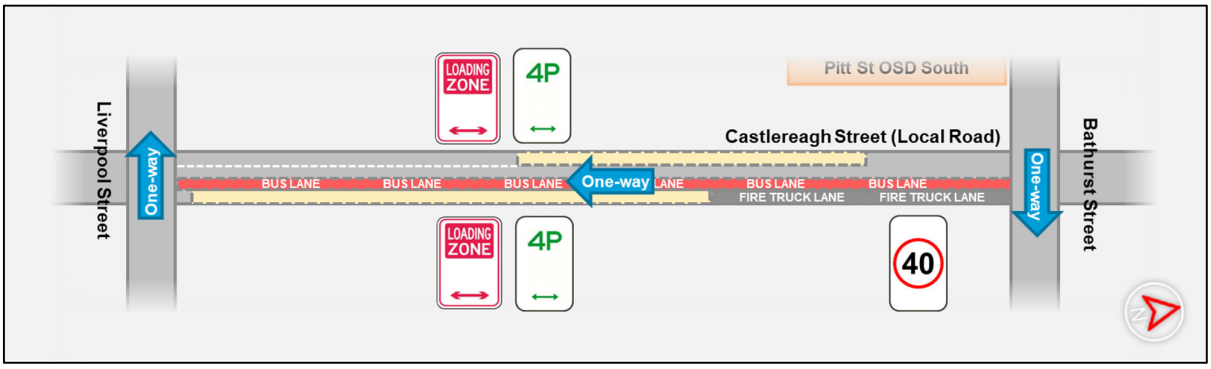


Figure 3-3: Castlereagh Street Road Characteristics

3.2 Planning Context

Based on the City of Sydney Planning Controls Map, as shown in Figure 3-4, the Sydney Local Environmental Plans (LEP) 2012 applies to the development, providing guidelines and recommendations on the development design.

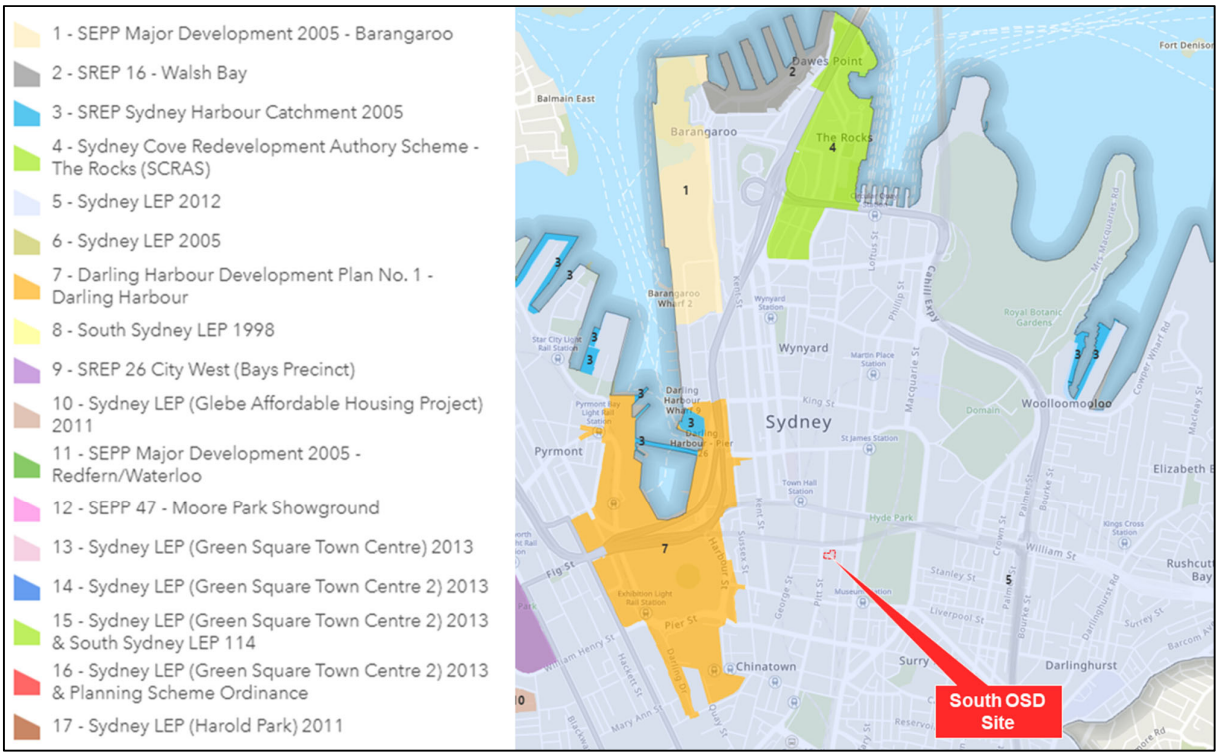


Figure 3-4: City of Sydney Planning Controls Map (source: City of Sydney, last modified 13 September 2019)

3.3 Previous Site Development

The previous land use on the site consisted of a hotel and ground floor retail components. The hotel comprised 136 bedrooms with storage for up to 9 bicycle spaces and an associated office/reception area. On the ground floor, there was a café/restaurant that operated as part of the hotel. The development did not include any vehicle parking facilities or off street drop off/pick up facilities. All operations associated with the hotel were undertaken from the adjacent road network including Pitt Street, Bathurst Street and Castlereagh Street via the on-street parking along the kerbside.

According to the RMS Guide to Traffic Generating Developments, it is estimated that the previous facility (i.e. “Motel”) could have potentially generated approximately 400 trips per day and 50 trips during peak periods, with daily trip rates of 3 vehicles per unit and peak hour trip rates of 0.4 vehicles per unit.

3.4 Parking Areas and Loading Zones

As mentioned in Section 3.1, a combination of on-street paid public parking, loading zones and bus lanes are available on the streets immediately surrounding the development.

There are currently several public parking buildings located within 400m of the site, as tabulated in Table 3-1, and shown in Figure 3-5. These parking facilities provide a total of 3,713 public bays with varying parking fees. Among these stations, there are currently three parking stations that operate 24 hours a day with an overall total of 1,437 parking spaces. Additionally, on-street metered parking spaces are available in the surrounding network as shown in Figure 3-6. A number of loading zones are also available on the surrounding road network, as shown in Figure 3-7.

Table 3-1: Public parking within 400m of the site

Parking Building	Address	Operation Hour	Number of Parking Space
Sheraton	123 Castlereagh Street	24 hours	115
Piccadilly	133 Castlereagh Street	6:00am – 1:00am	231
Citigroup Centre	271 Pitt Street	6:00am – 7:00pm	275
Hilton	259 Pitt Street	24 hours	429
Wilson (201 Elizabeth St)	190 Castlereagh Street	7:00am – 6:00pm	30
Wilson (St Andrew's House)	464 Kent Street	6:00am – 12:00am	243
528 Kent Street	528 Kent Street	24 hours	893
Wilson (HSBC Centre)	14 Wilmot Street	7:00am – 7:00pm	137
World Square	50 Goulburn Street	7:00am – 1:00am	359
Goulburn Street Parking Station	101 Goulburn Street	6:00am – 12:00am	735
Wilson (175 Liverpool Street)	26 Nithsdale Street	7:00am – 12:00am	266
		Total	**3,713**

** Source: TfNSW Tomorrow's Sydney Interactive Map, updated on 30/08/2018*

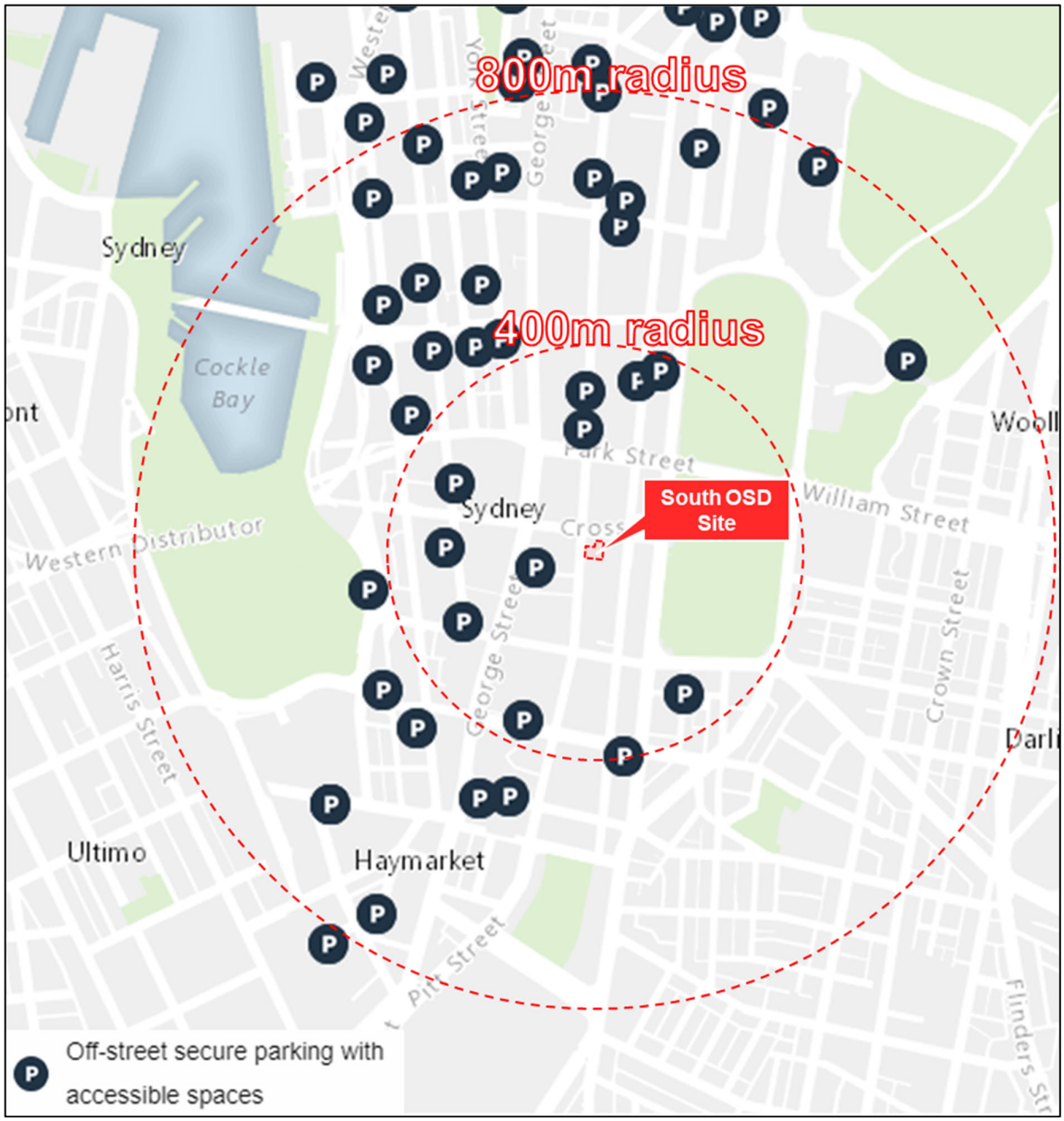


Figure 3-5: Available parking station in the vicinity of the site (Source: City of Sydney Accessibility Map)

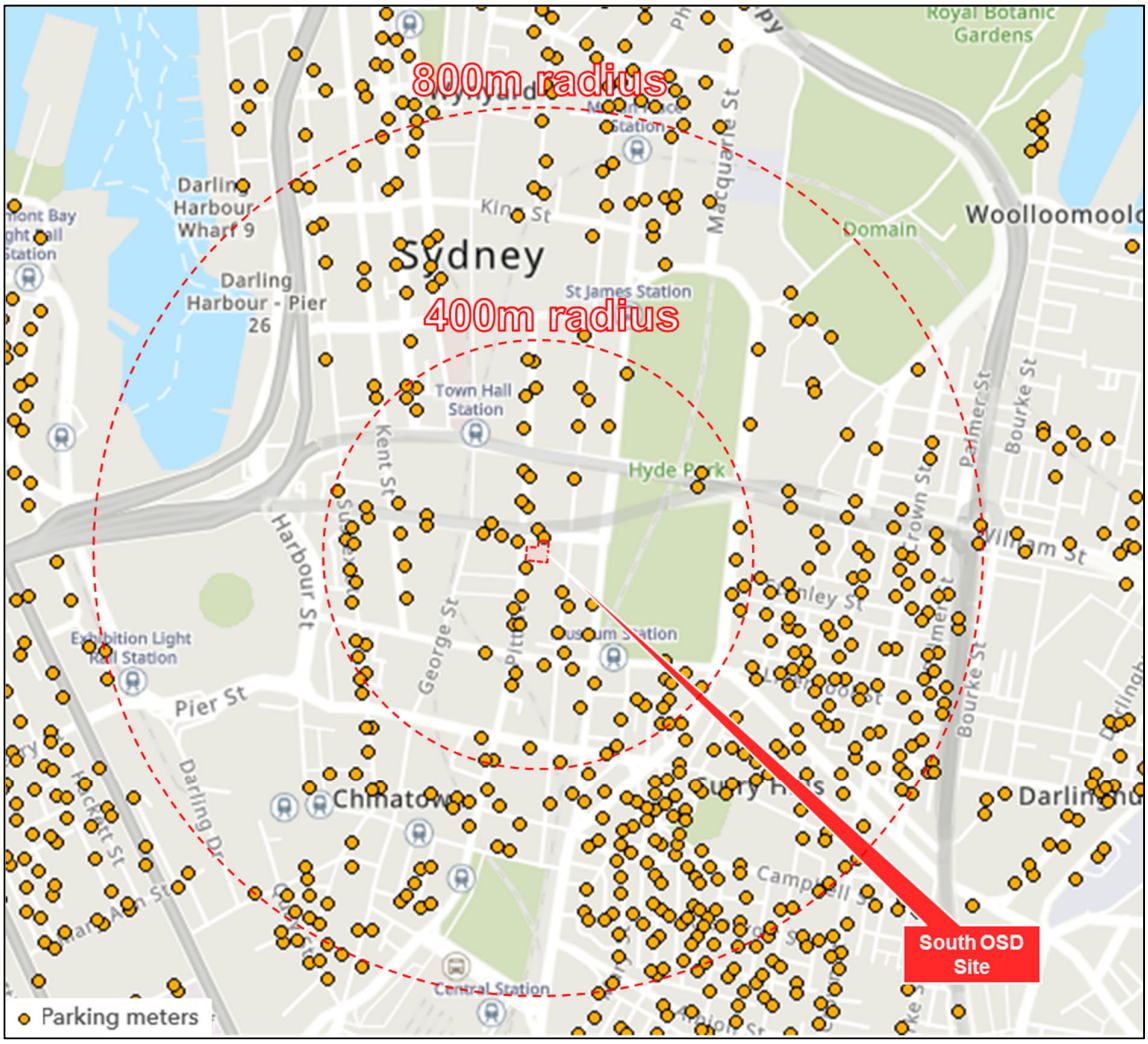


Figure 3-6: Available on-street parking spaces in the vicinity of site (Source: City of Sydney Map of parking meters in the city)

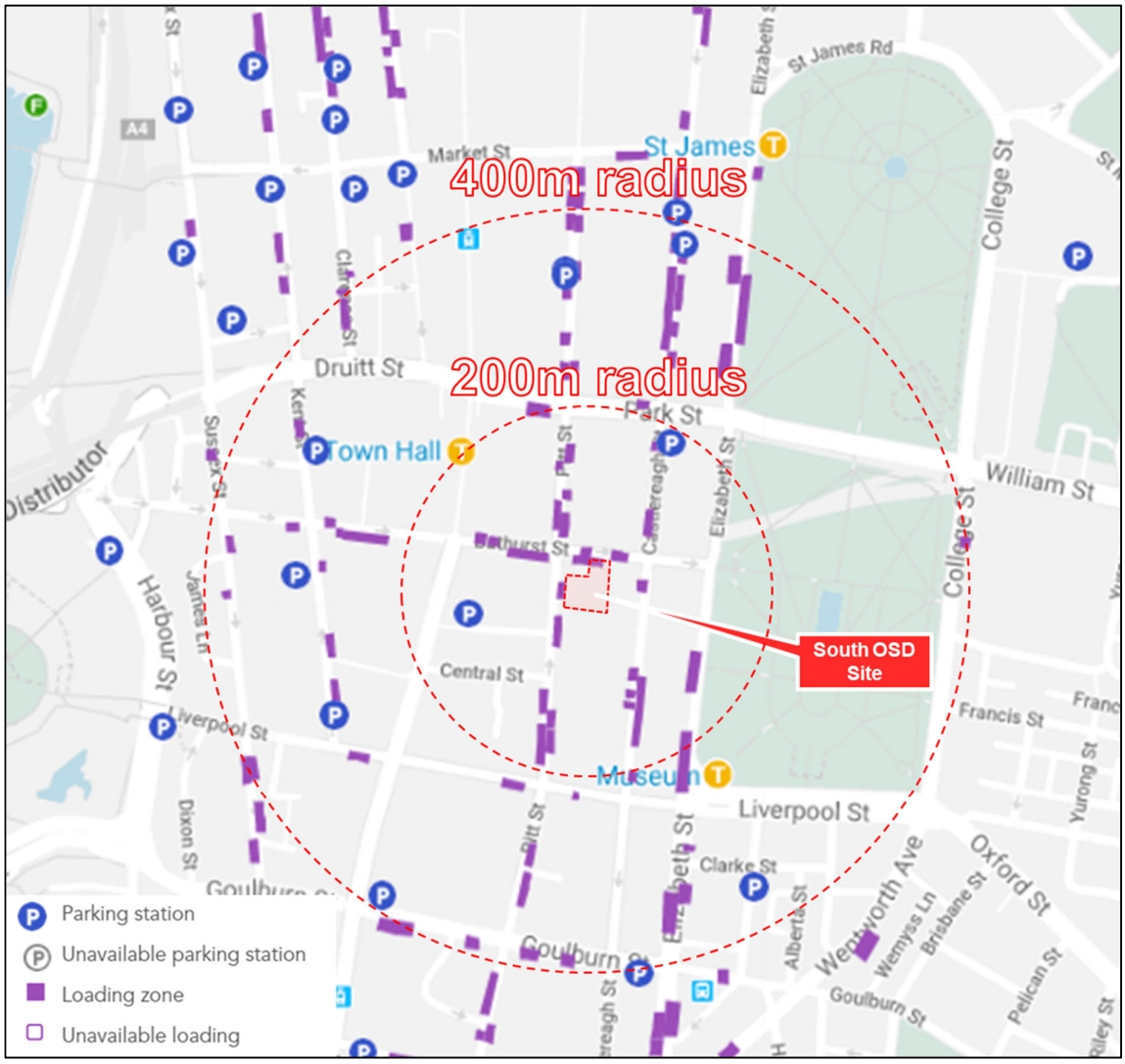


Figure 3-7: Available loading bays in the vicinity of the site (Source: TfNSW Tomorrow's Sydney Interactive Map)

3.5 Taxi Zones

According to interactive maps sourced from the TfNSW Tomorrow's Sydney, there are numerous taxi zones that are currently located within 400m of the site. With reference to Figure 3-8, two taxi zones are located directly north-west of the site along Pitt Street and Bathurst Street. These two taxi zones are classified as taxi set-down only (1 bay) and taxi rank (2 bays) respectively.

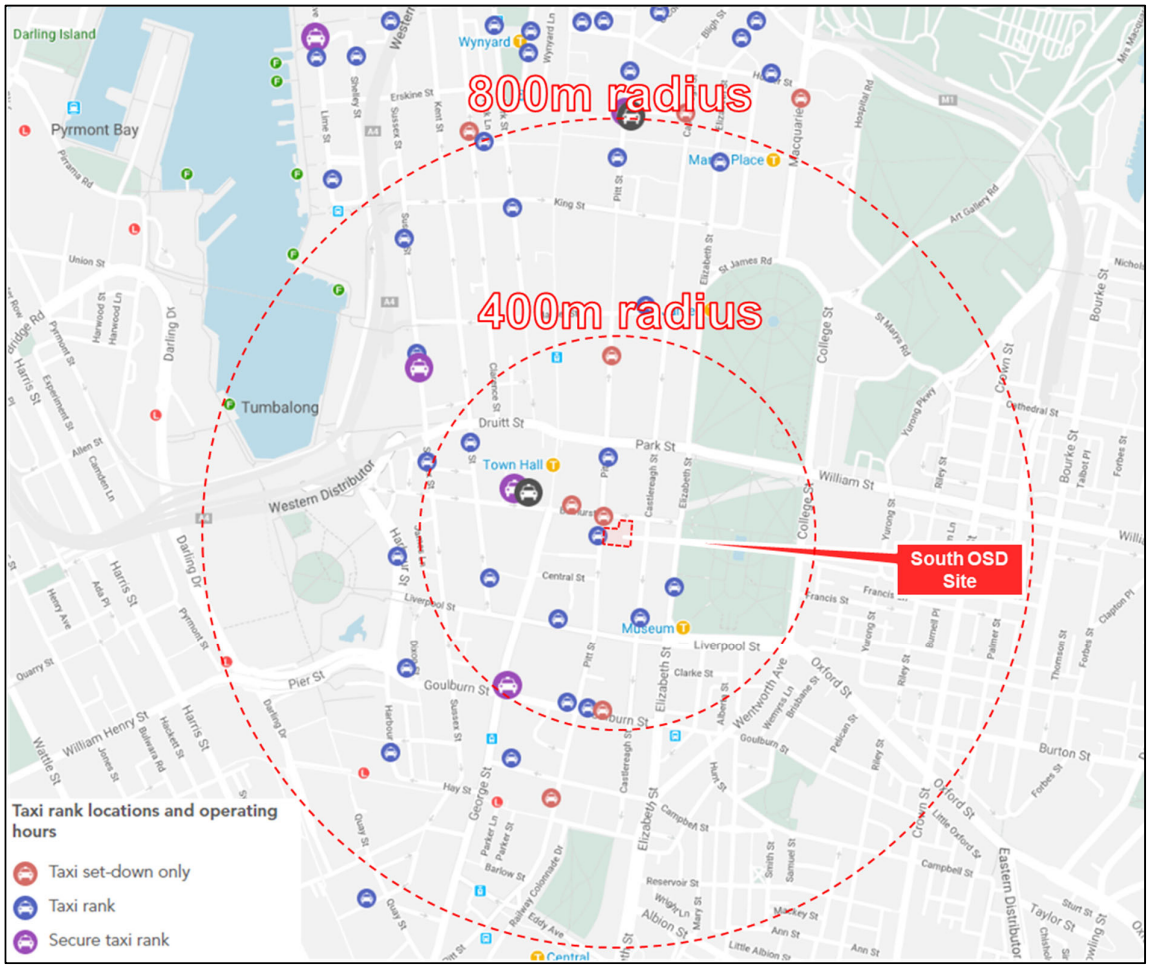


Figure 3-8: Taxi rank locations in the vicinity of the site (Source: TfNSW Tomorrow's Sydney Interactive Map)

3.6 Coach Parking

According to the information sourced from the City of Sydney Accessibility Map, as shown in Figure 3-9, there are eight coach parking areas available within 400m radius of the site, with one located directly to the south-west of the site along Pitt Street. The coach parking bay is 15m long, with a 15 minute parking limit. It is understood that the local hotels in the proximity are currently utilising these coach parking zones for guest drop-off and pick-up.

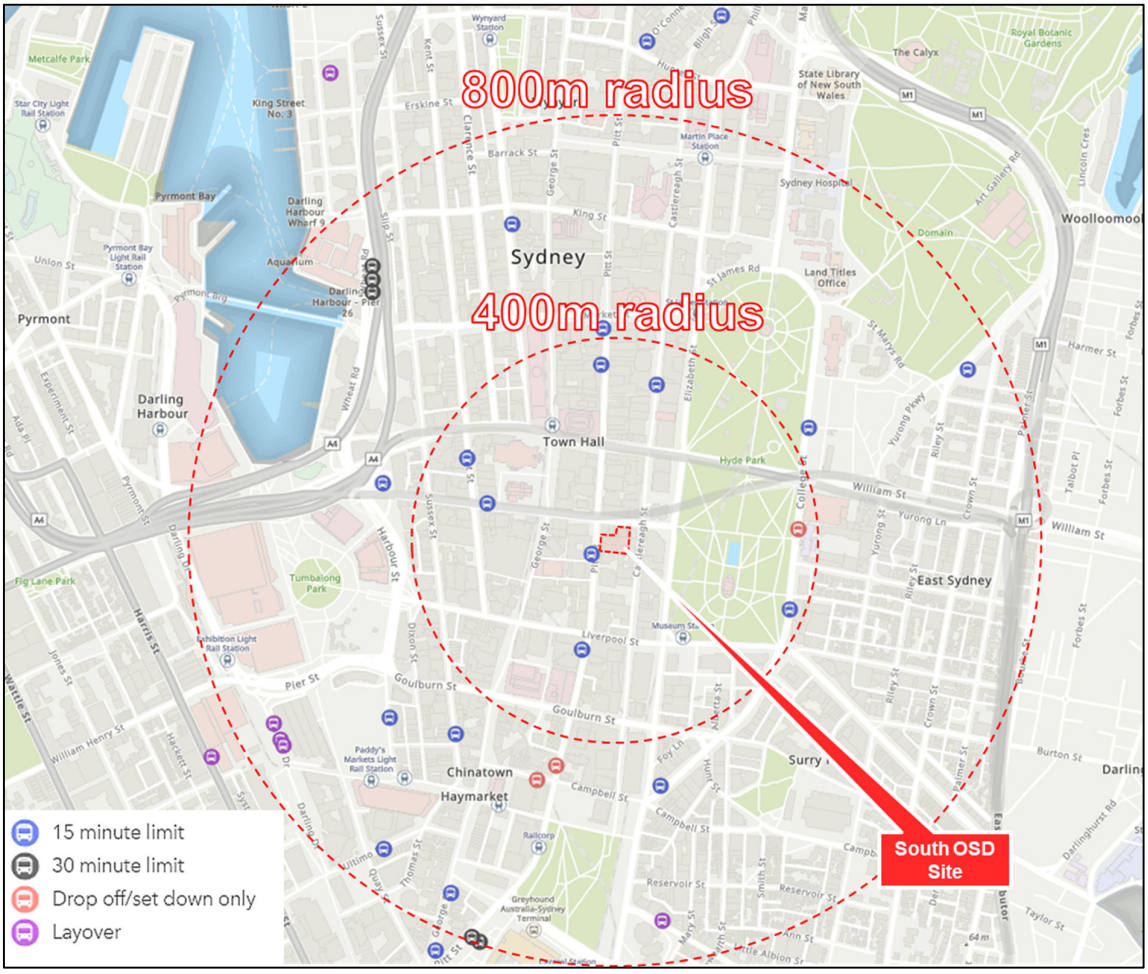


Figure 3-9: Bus and Coach parking zones in the vicinity of the site

3.7 Public, Active and Sustainable Transport

The site is situated in the heart of Sydney CBD, which has a range of public transport services. The Australian Bureau Statistics 2016 Census of Population and Housing (ABS 2016 Census) identifies that the majority of commuters (approximately 88%) who reside within the CBD (refer to Figure 3-10) took public transport or active transport to work (refer to Figure 3-11). The public transport stops in the vicinity of the site, including bus, light rail and train are shown in Figure 3-12.

Figure 3-10: ABS 2016 State Suburb boundary (basemap: ABS Map)

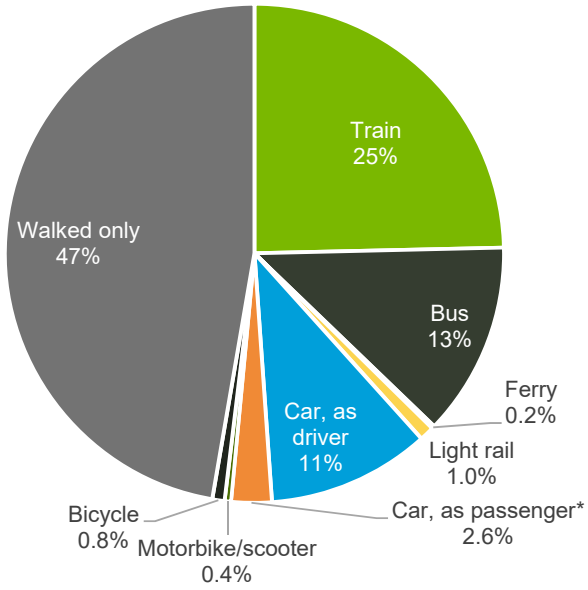


Figure 3-11: Mode of transport to work for people who live within Sydney (source: ABS 2016 Census)

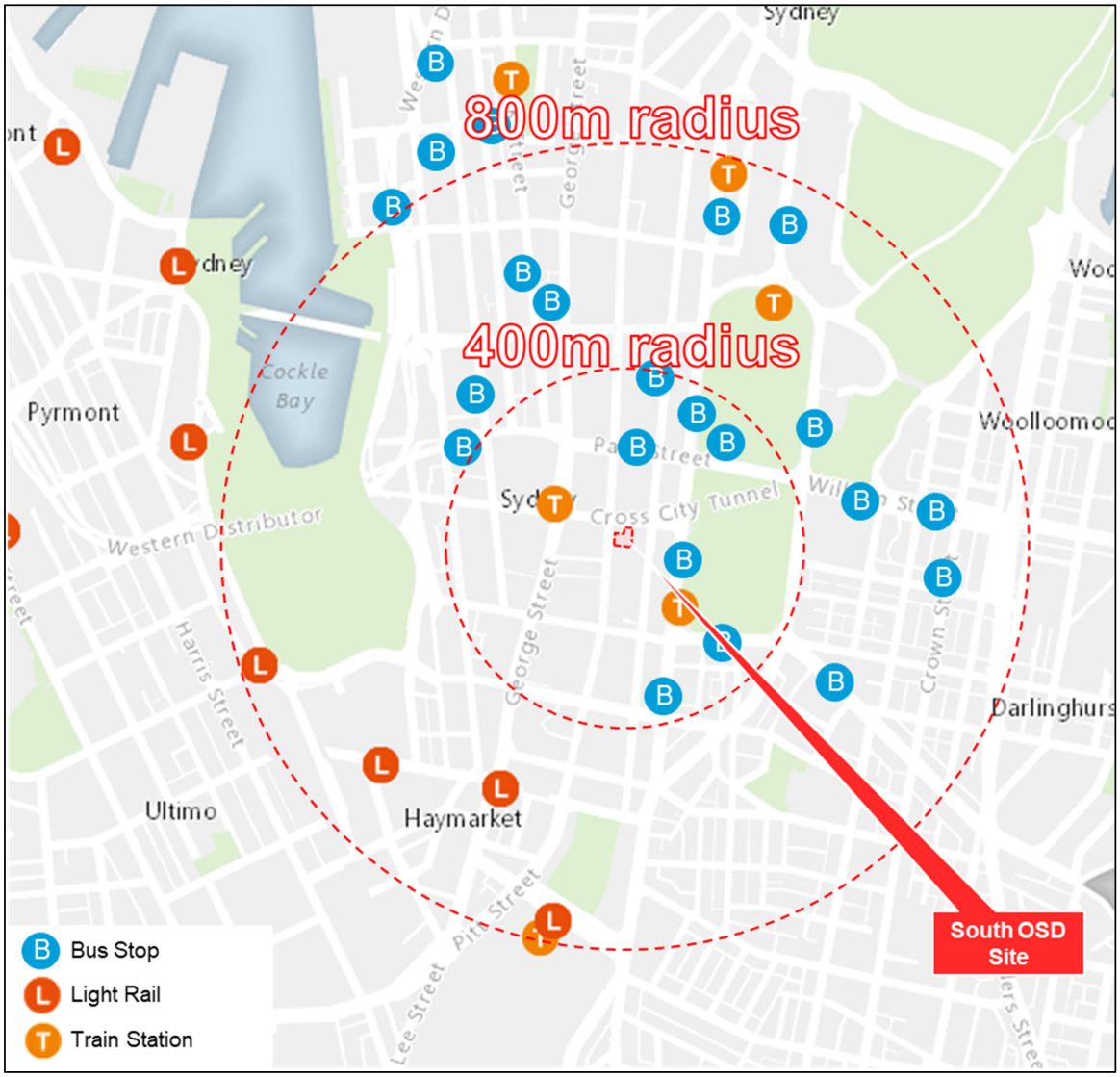


Figure 3-12: Public transport facilities in the vicinity of the site (base map: City of Sydney Accessibility Map)

3.7.1 Bus Services

There are several bus stops located within close proximity (400m) of the site along Castlereagh Street, Elizabeth Street, Park Street and Liverpool Street. The closest bus stops to the site are shown in Figure 3-13. These bus stops are served by high frequency buses during peak and off-peak periods, that circulate within the Sydney CBD, as well as providing services to other suburbs and regions, as summarised in Table 3-2.

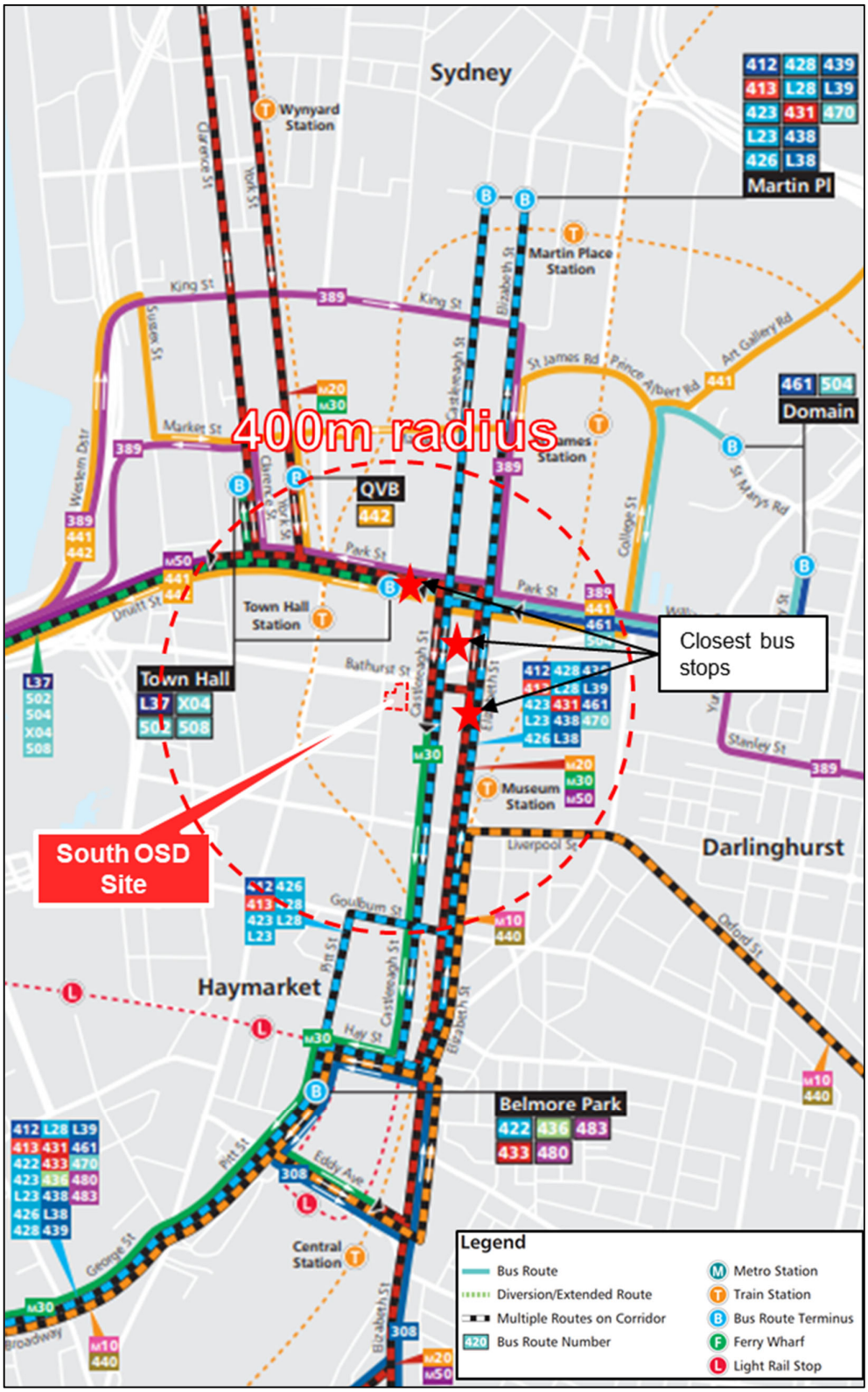


Figure 3-13: Bus routes in the vicinity of the site (Source: Transport NSW, effective from 28/07/2019)

Table 3-2: Bus services operate within 400m from the site (source: Transport NSW)

Bus Route	Route Description	Bus Route	Route Description
M10	Maroubra Junction to Leichhardt via City	439	Mortlake to City Martin Place
M20	Botany to Gore Hill	440	Bondi Junction to Rozelle
M30	Sydenham to Taronga Zoo	441	City Art Gallery to Birchgrove via City QVB
M50	Coogee to Drummoyne	442	City QVB to Balmain East Wharf
311	Millers Point to Central Railway Square via Darlinghurst & Potts Point	461	Burwood to City Domain
324	Watsons Bay to Walsh Bay via Old South Head Road	470	Lilyfield to City Martin Place
325	Watsons Bay to Walsh Bay via Vaucluse Road	502	Five Dock to City Town Hall
389	Bondi Junction Pyrmont	504	Chiswick to City Domain
412	City Martin Place via Earlwood	508	Drummoyne to City Town Hall
413	Muswellbrook to Highbrook	L23	Kingsgrove to City Martin Place
423	Kingsgrove to City Martin Place	L28	Cantebry to City Martin Place
426	Dulwich Hall to City Martin Place	L37	Haberfield to City Town Hall
428	Cantebry to City Martin Place	L38	Abbotsford to City Martin Place
431	Glebe Point to City Martin Place	L39	Mortlake to City Martin Place
438	Abbotsford to City Martin Place	X04	City Domain to Chiswick

3.7.2 Train Services

The site has good accessibility to the existing train services within Sydney CBD. With reference to Figure 3-14, there are two stations located within 400m of the site, including Town Hall Station located north-west of the site, and Museum Station located south-east of the site. Additional rail stations are located within 800m of the site, including Martin Place Station, St James Station and Central Stations. There are eight railway lines that are currently operate via these stations as tabulated in Table 3-3 and schematically shown in Figure 3-15.

Figure 3-14: Train stations within the vicinity of the site (source: City of Sydney Accessibility Map)

Table 3-3: Railway services operating at Town Hall Station (source: Transport NSW)

Rail Service	Route Description	Weekday Frequency (Peak/ Off-peak)	Weekend Frequency
T1 North Shore Line & Northern Line	Berowra to City via Gordon	5-15 minutes/ 30 minutes	15 minutes
T1 Northern Line	Hornsby to City via Macquarie University	15 minutes	15 minutes
T1 Western Line	Emu Plains or Richmond to City	5-20 minutes/ 30 minutes	30 minutes

Rail Service	Route Description	Weekday Frequency (Peak/ Off-peak)	Weekend Frequency
T2 Inner West & Leppington Line	Parramatta or Leppington to City	10 minutes/ 15 minutes	15 minutes
T3 Bankstown Line	Liverpool or Lidcombe to City via Bankstown	10-15 minutes/ 30 minutes	30 minutes
T4 Eastern Suburbs & Illawarra Line	Waterfall or Cronulla to Bondi Junction	20 minutes/ 30 minutes	30 minutes
T8 Airport & South Line	Macarthur to City via Airport or Sydenham	10-15 minutes/ 30 minutes	15 minutes
Central Coast & Newcastle Line	Newcastle Interchange to Central via Strathfield or Gordon	10-15 minutes/ 60 minutes	60 minutes

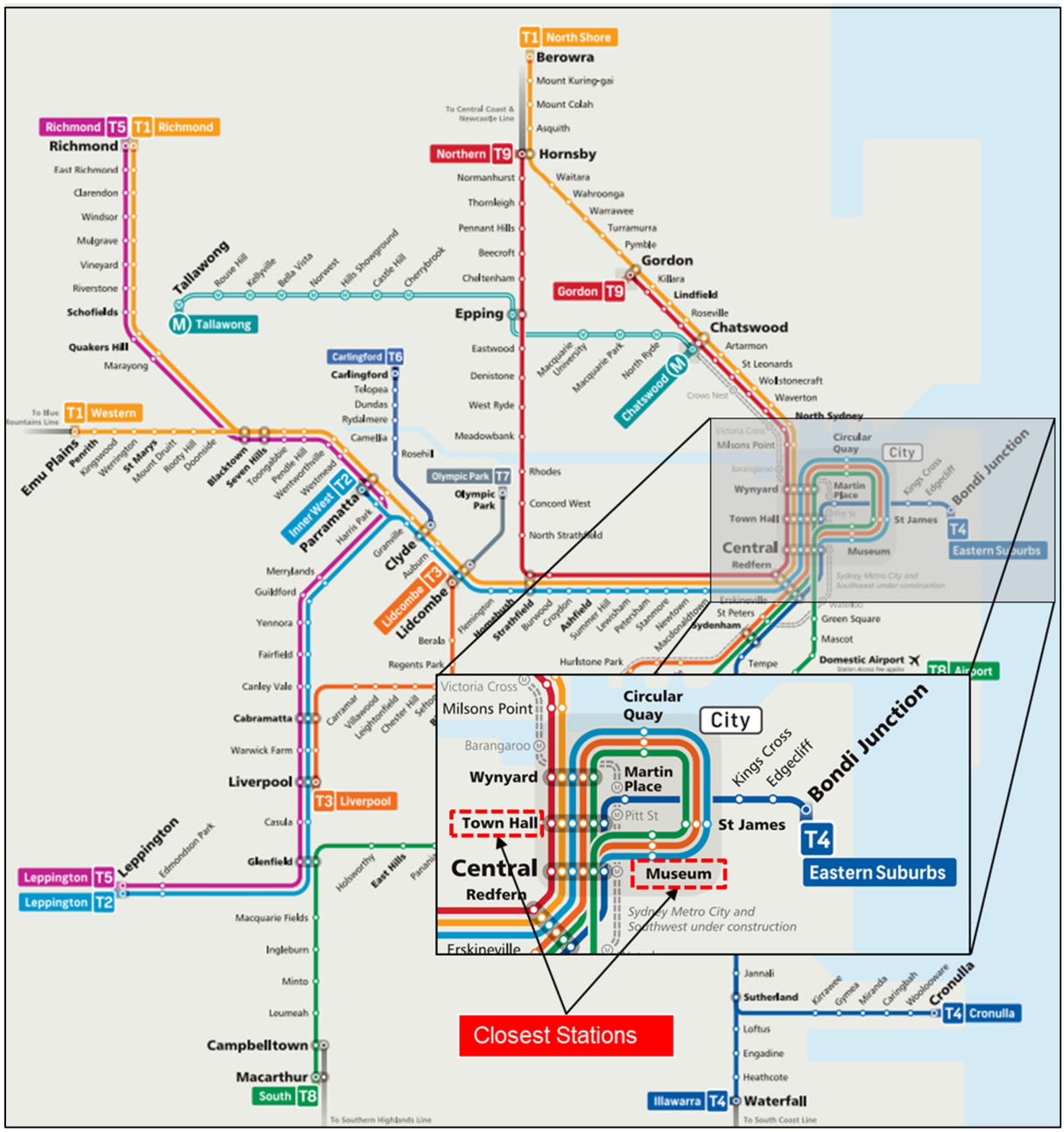


Figure 3-15: NSW Railway routes (source: Transport for NSW)

3.7.3 Light Rail Services

The Sydney Inner West Light Rail operates between Dulwich Hill and Central. The closest stop from the site is Capitol Square, located on Hay Street approximately 600m to the south of the site, as shown in Figure 3-16. The light rail operates with a service frequency of every eight minutes during the weekday peak periods and 10 minutes during the weekday off-peak periods. On the weekend, it only operates on Saturday with 15 minute service frequencies.

The new light rail, Sydney CBD and South East Light Rail, was opened to the public in December 2019, with the route and stops shown in Figure 3-16. The light rail operates along a 12km route including 19 stops extending from Circular Quay along George Street to Central Station, through Surrey Hills to the Moore Park precinct, and includes key stops the Sydney Cricket Ground and Allianz Stadium. From Central Station, the route continues in a southbound direction to Kensington and Kingsford (Line 3) via Anzac Parade, Alison Road and High Street to Randwick (Line 2), stopping at the race course, the University of NSW, and the Prince of Wales Hospital. The new light rail to Kingsford (Line 3) in both directions opened in March 2020. The light rail service operates with a frequency of every four to eight minutes between Circular Quay and Central, and every eight to ten minutes between Central and Randwick, from 7am to 7pm every day, with slightly reduced frequencies during the off-peak periods (5am to 7am and 7pm to 1am). The closest stop from the site is Town Hall stop, located approximately 170m from the site on Druitt Street.

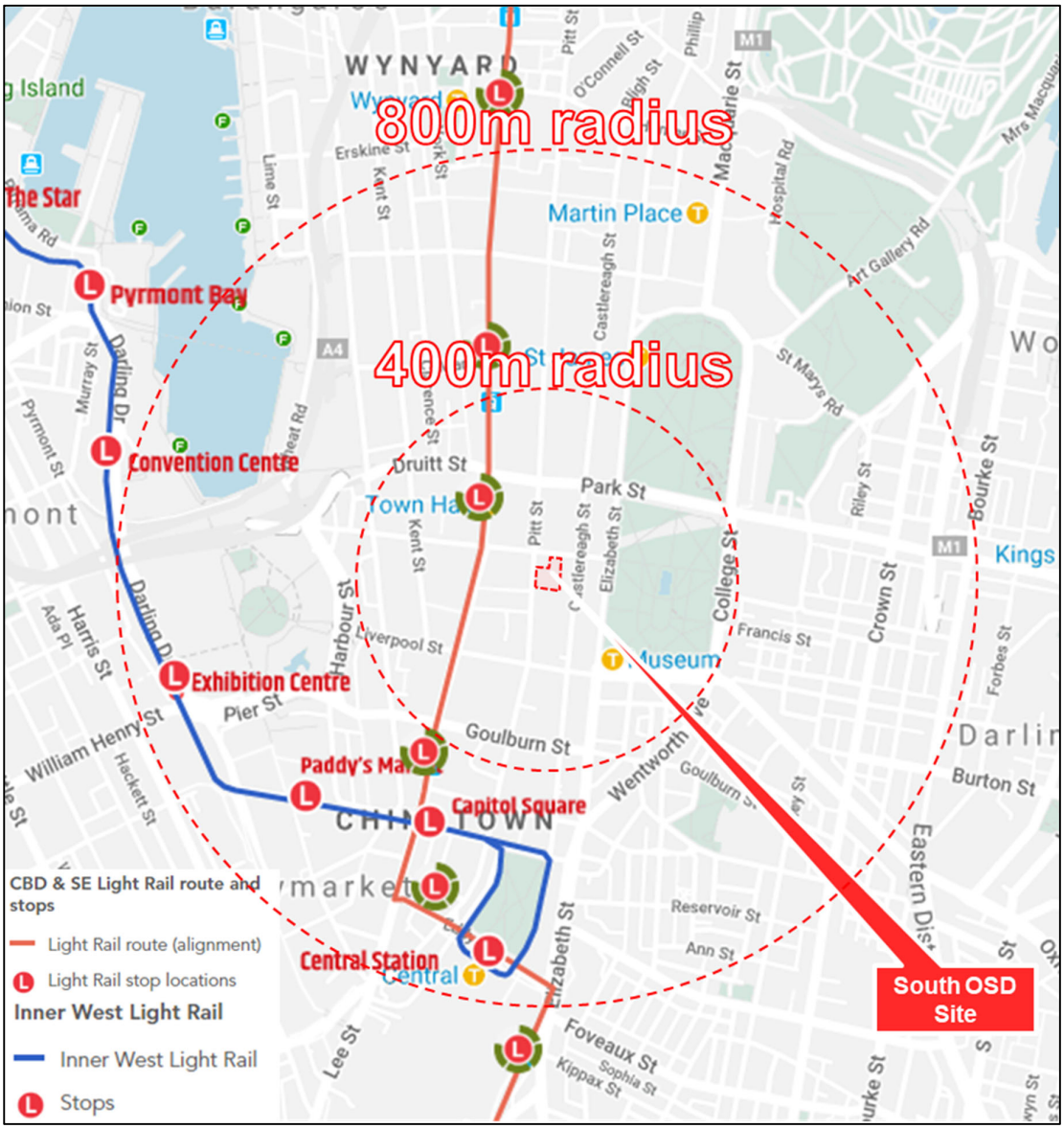


Figure 3-16: Sydney CBD & South East Light Rail (source: Sydney Light Rail Interactive Map)

3.7.4 Ferry Services

The Barangaroo Ferry Wharf is located approximately 1.2km to the north-west of the site. There are currently two ferry lines operating at the wharf; Parramatta River line (F3) and Cross Harbour line (F4), as shown in Figure 3-17 and Figure 3-18. There is currently no public transport servicing between site and Barangaroo Ferry Wharf. However, the new Sydney Metro line will have one of the stations at Barangaroo and improves the site accessibility towards the ferry services with two train stops from Pitt Street Station as shown in Figure 3-19. Alternatively, the users could access all the ferry services at Circular Quay on the north via the train services (T2, T3 and T8) as shown in Figure 3-14, or via the new Town Hall light rail stop for the Sydney CBD and South East Light Rail as shown Figure 3-16.

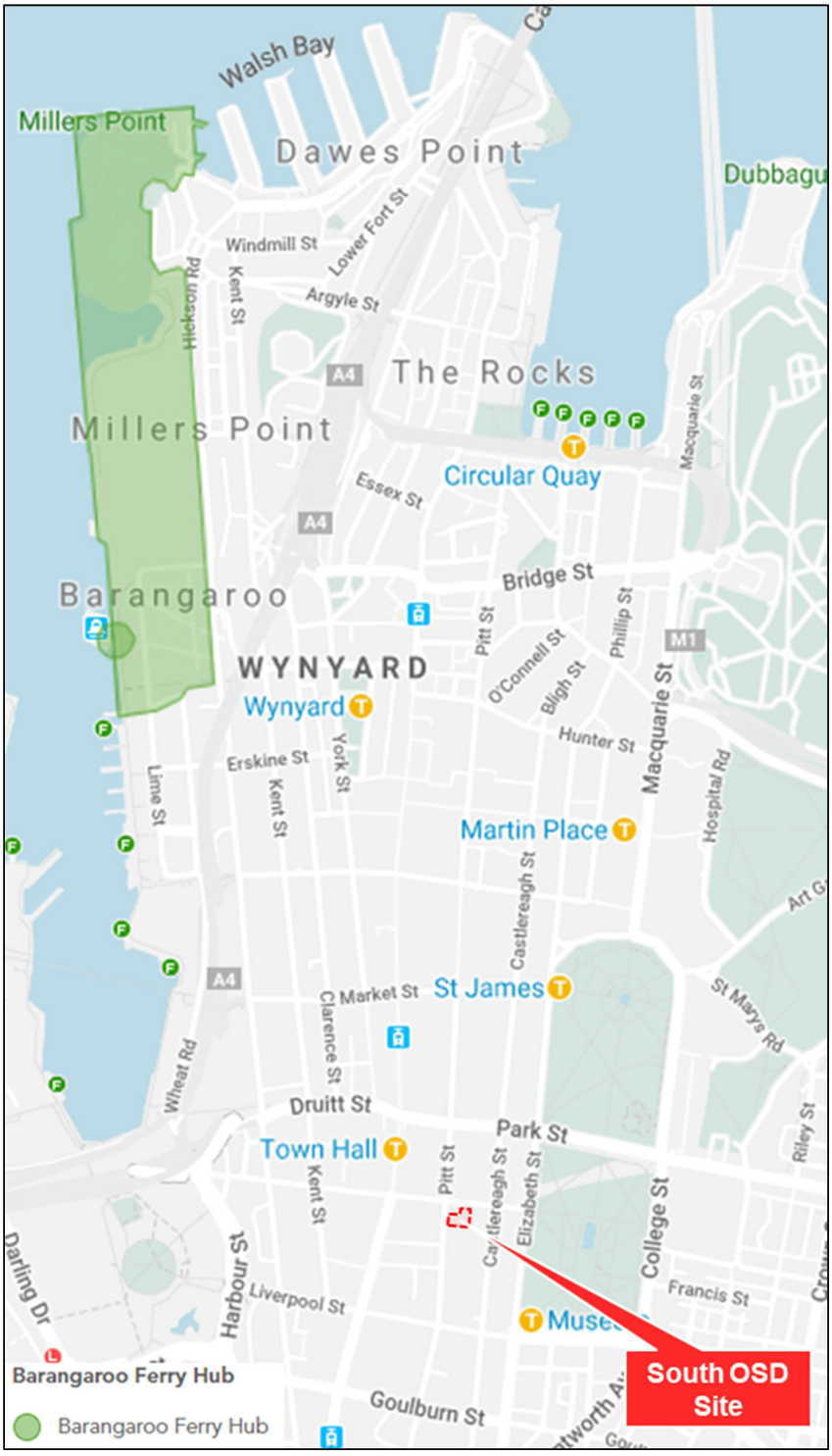


Figure 3-17: Barangaroo Ferry Hub (source: TfNSW Tomorrow Sydney Interactive Map)

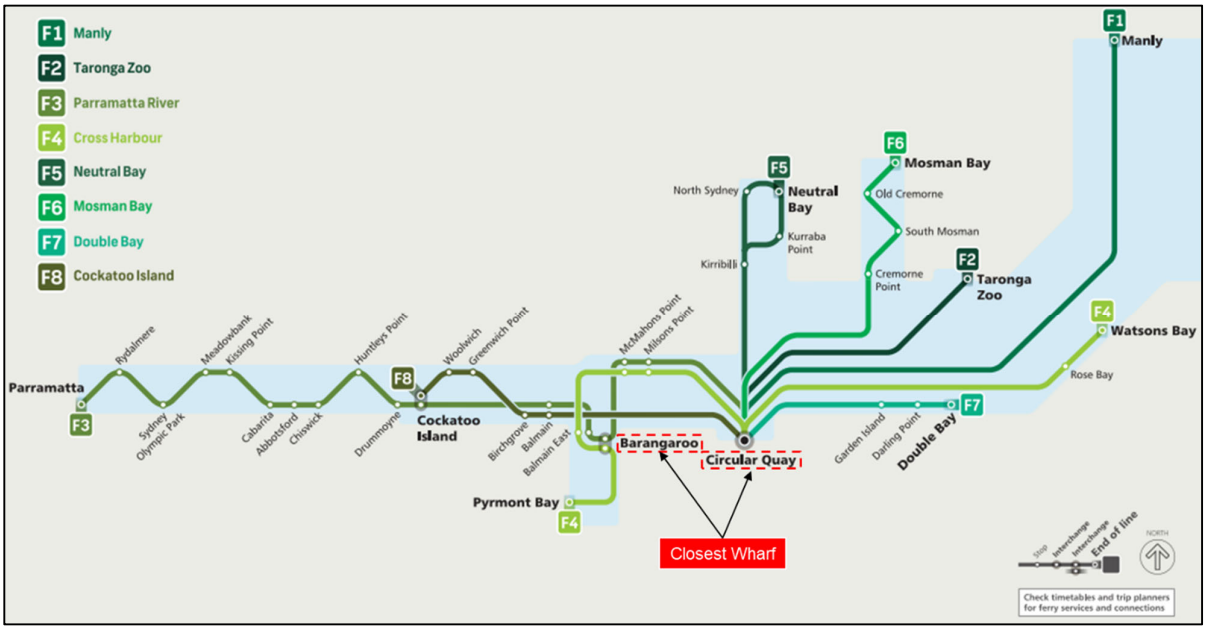


Figure 3-18: Sydney ferry lines (source: TfNSW)

Figure 3-19: Barangaroo Metro Station (source: Pitt Street Over Station Development – Concept State Significant Development Application – Environmental Impact Statement Overview, 23/08/2018)

3.7.5 Cycling

Cycling routes on the surrounding network include separated off-road cycle ways, off-road shared paths and on-road bicycle lanes. Based on the City of Sydney's Cycleway map shown in Figure 3-20, the following infrastructure is provided in the vicinity of site:

- Pitt Street and Castlereagh Street are classified as "direct routes with higher traffic" with no bicycle infrastructure;
- Park Street on the north of site (approximately 180m) is classified as a "direct route with higher traffic" with no bicycle infrastructure;
- Kent Street on the west of site (approximately 280m) is classified as "separated off-road cycleway", with a solid median strip separating on-street cycling lanes and traffic lanes;
- Wilmot Street and Central Street on the southwest of the site (approximately 100m) are classified as "low traffic street or bike lane", with no bike lanes available along the corridor;
- Liverpool Street on the south of the site (approximately 200m) is classified as "separated off-road cycleway", with a solid median strip, separate on-street cycling lanes and traffic lanes begin on the east of Ken Street; and
- Wide shared paths are available within Hyde Park, which are classified as "off-road shared paths".

The "direct routes with higher traffic" adjacent to the site along Pitt Street connects to the "off-street shared path" to the west of Sydney Tower, between the Pitt Street Mall section, and extends to Circular Quay along a "low traffic street or bike lane". Similar infrastructure is also provided circulating the northern suburbs; The Rocks, Miller Points and Barangaroo, via George Street to the west of Pitt Street.

The "separated off-road cycleway" along Kent Street to the west of the site provides the connection to the norther suburbs as well. While for the ride to the south, the facility on Kent Street continues onto Castlereagh Street leading to the Sydney Central Station with an off-street shared path closer to the station.

To reach destinations on the east from the site, Park Street, which is classified as a "direct route with higher traffic" provides the most direct access connecting to numerous "low traffic street or bike lane" corridors, as well as to the Elan Tower on William Street. While to the southwest, similar classification on Liverpool Street provides the accessibility to the local "low traffic street or bike lane" corridors and other cycling facilities connecting to multiple significant destinations such as Sydney high schools, Moore Park, stadiums and others.

To the west, Kent Street provides the access to the off-street shared path on Pyrmont Bridge and continues to the Anzac bridge to Rozelle. While to the southwest, Liverpool Street provides the connectivity towards the cycling facility within the regions.

In addition, substantial numbers of public bicycle parking spaces are available within the City of Sydney as shown in Figure 3-21, with concentrated provision along the corridors that are surrounded by high density developments.

The NSW Government's Sydney City Centre Access Strategy issued in December 2013 has identified that the city centre cycleways will be a significant transport solution for keeping people moving. The strategy has recommended a north-south separated cycleway between Central and Circular Quay that runs along Castlereagh Street to King street then down Pitt Street as the key north-south connectivity, which sits next to the site. This has also been seen as the priority for City of Sydney as outlined in the Cycling Strategy and Action Plan 2018-2030 as shown in Figure 3-22.

The cycleway on the south side of Castlereagh Street opened in September 2015, connecting between Central Station (Hay Street) and Liverpool Street. While the northern section of the cycleway has been deferred due to the Sydney CBD and South East Light Rail construction.

The completion of the cycle network connection along Castlereagh Street will provide direct accessibility for cyclists (employees and visitors) to the site and minimise reliance on private motor vehicles.

Figure 3-20: Sydney cycling map June 2019 version 1.3 (source: City of Sydney)

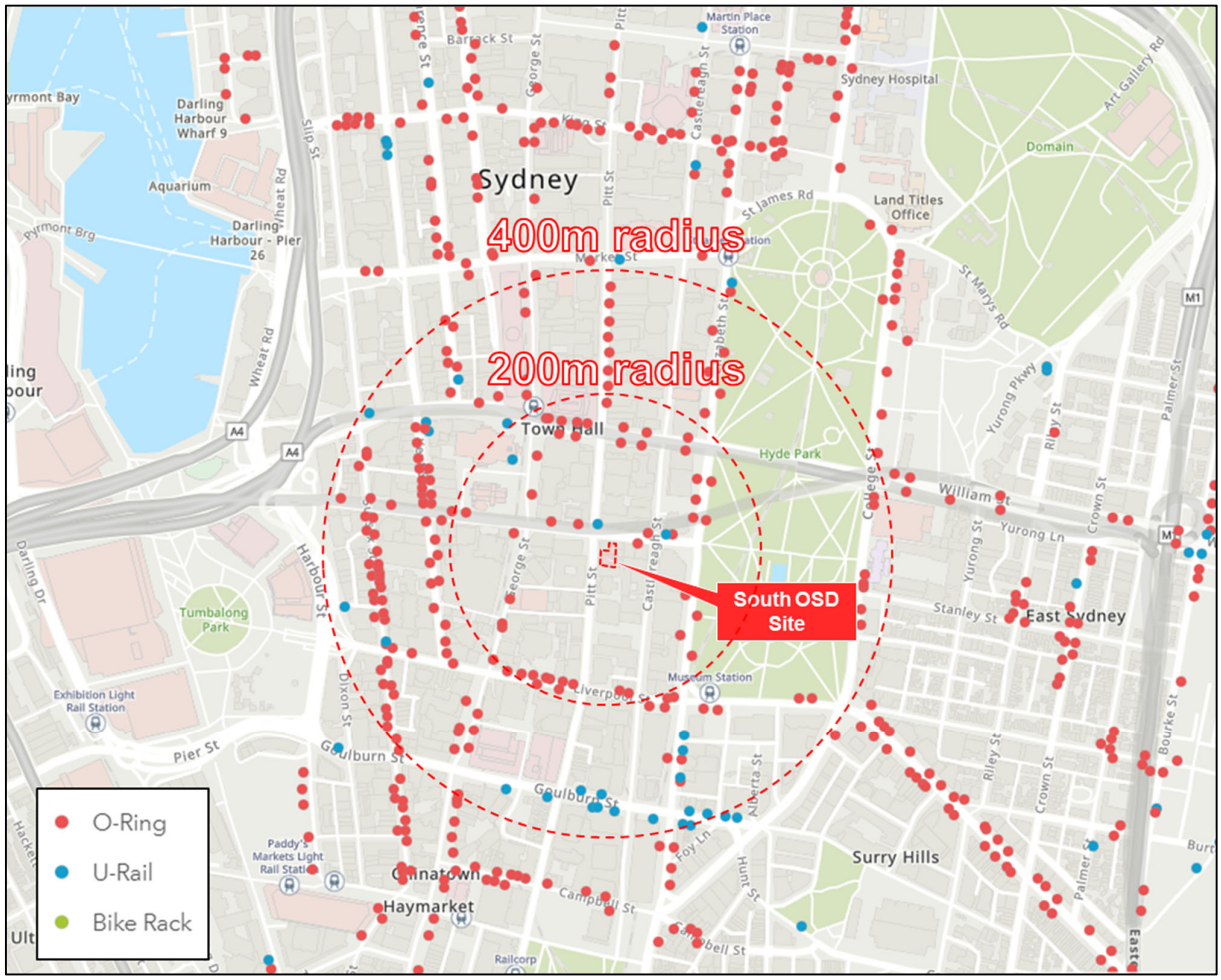


Figure 3-21: City of Sydney bike parking map (source: City of Sydney, last modified 11/07/2019)

Figure 3-22: Cycling Strategy and Action Plan For a more sustainable Sydney, Priority 1 (source: City of Sydney)

3.7.6 Walking Access

The site is surrounded by approximately 3.3m wide footpaths along its frontages, with signalised pedestrian crossing available to the northwest at Bathurst Street / Pitt Street intersection. Similar footpath widths are also available along the surrounding corridors with pedestrian signal protection at signalised intersections, and at the midblock corridors that comprise high pedestrian demand.

The Sydney CBD has high levels of pedestrian density and demand due to the concentrated businesses in the precinct. During peak periods, the pedestrian crossings on the road network can become congested as a result of limited space provided. For the footpaths on the surrounding network of the site, there is significant pedestrian demand, including along the frontages to Pitt Street and Bathurst Street. Both the signalised

intersections on Bathurst Street at Pitt Street and Castlereagh Street have designated signalised pedestrian crossings on all approaches. It is anticipated that with the ongoing implementation of the Sydney City Centre Access Strategy, as well as the future operation of a new Pitt Street Metro Station, there is like to be substantial growth in walking demand on the surrounding footpaths.

The City of Sydney Council and Transport for NSW have been developing strategies to assist with prioritising the users and movements such as allocating sufficient space to support the current demand level, as well the estimated levels of growth in the CBD.

The recently completed Sydney CBD and South East Light Rail includes pedestrianisation of George Street that is estimated to deliver a significant shift in the priority of spatial allocation towards pedestrians, by providing more space for people to walk between Hunter Street and Bathurst Street.

3.7.7 Car Share

The City of Sydney supports car sharing and the available services have been widely used within the Sydney CBD. Car sharing is a convenient, affordable and sustainable transport option for city residents and businesses in comparison to private vehicle ownership. A single car share parking space can reduce the need for up to 12 private parking spaces. The City of Sydney has recorded almost 31,000 residents and businesses who have joined the car share schemes that operate in Sydney, as shown in Figure 3-23, which shows the majority of users are local residents. There are currently three car share operators available within the Sydney CBD, including Car Next Door, Flexicar and GoGet, which have parking spaces in locations shown in Figure 3-24. It is estimated there are approximately 700 car share parking spaces within the City of Sydney.

There are currently five car share bays available located approximately 400m southeast of the site, equating to an estimated 7 minute walking time. Alternatively, users could utilise the future Pitt Street Metro Station to travel to Central Station, where many more car share spaces are available in close proximity to the station.

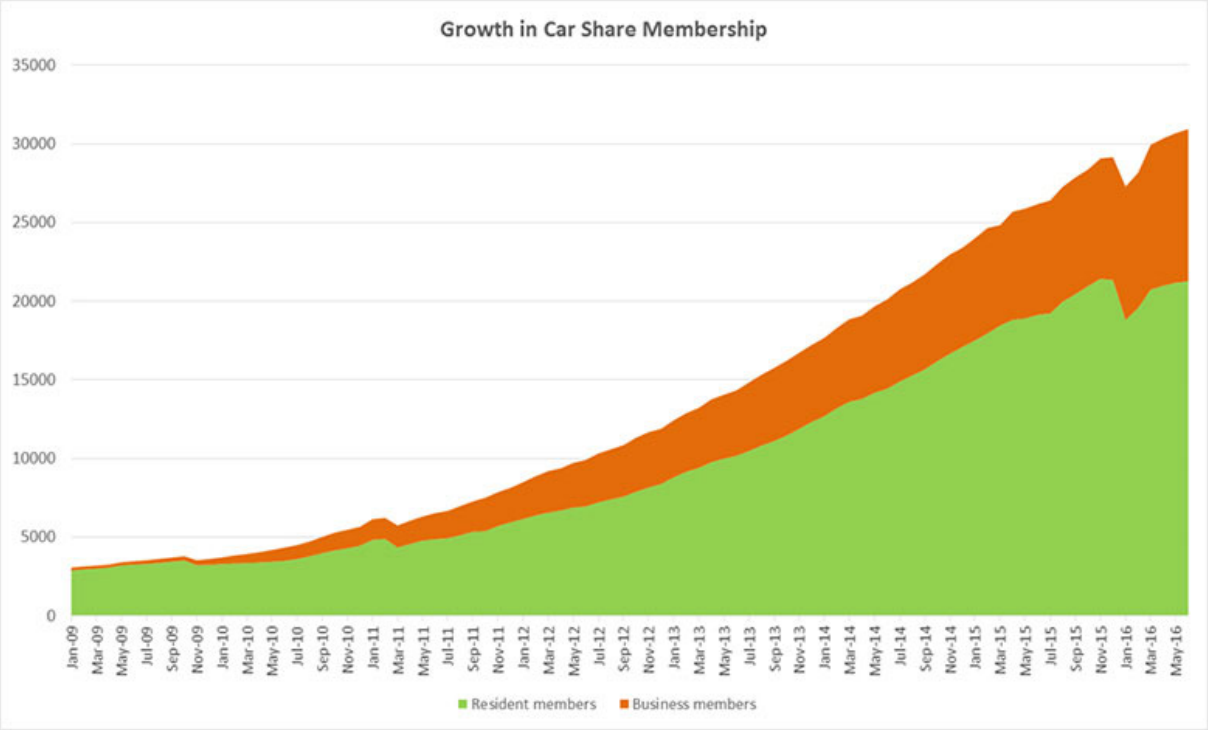


Figure 3-23: Growth in car share membership in Sydney (source: City of Sydney)

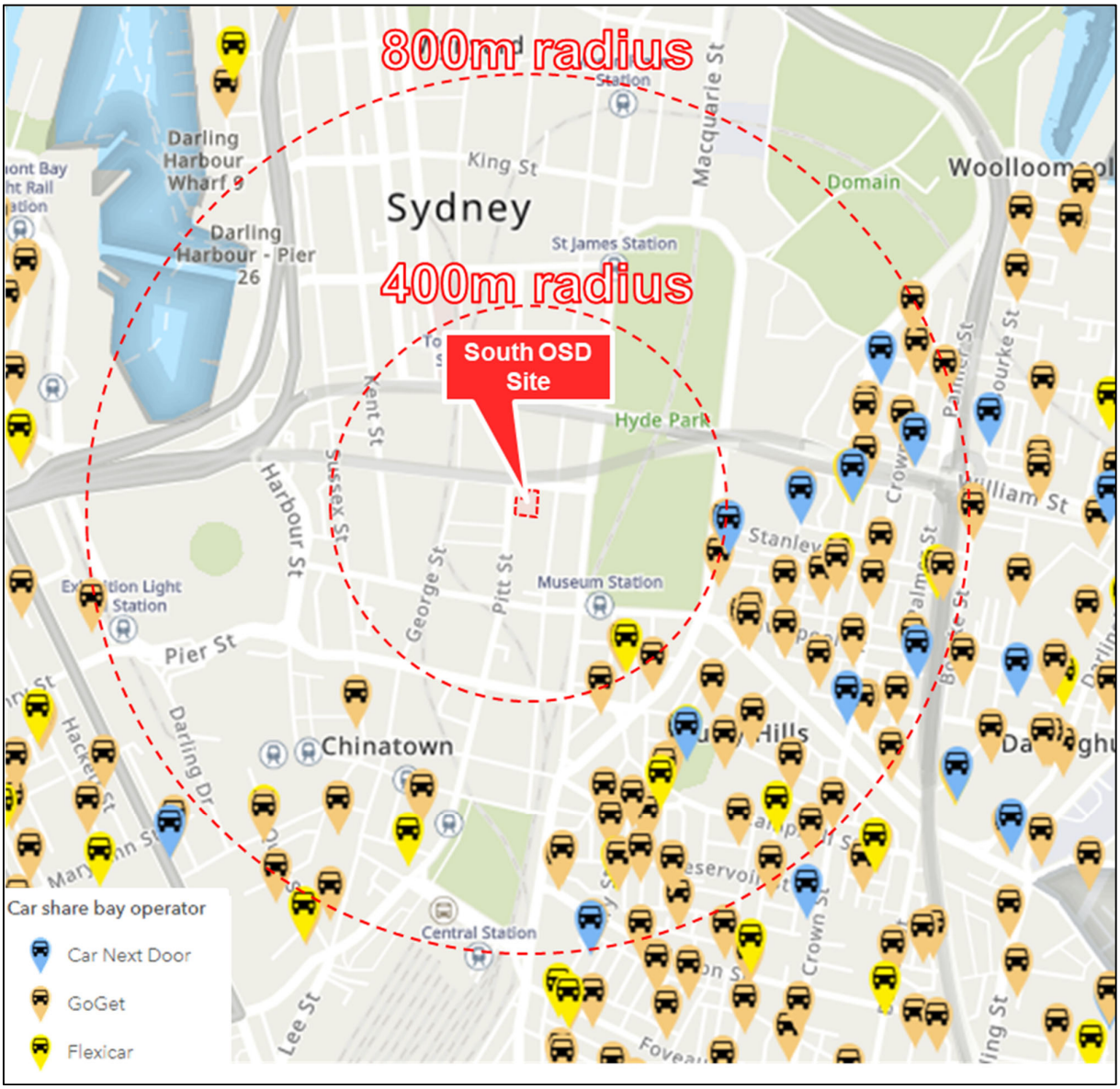


Figure 3-24: Car share bays available in the vicinity of the site (source: City of Sydney car sharing map)

4 Proposed Development

4.1 Overview of Proposed Development

The South OSD is to consist of 39 floor levels of predominantly residential land use, with retail. The development will be built to rent, comprising of the following:

- Residential dwellings:
  - 1 bedroom – 110 units;
  - 2 bedrooms – 118 units; and
  - 3 bedrooms – 6 units.
- Retail (level 2):
  - Gross Floor Area (GFA) – 682m^2.
- Bicycle parking facilities (level 2 and 3):
  - Level 2:
    - 12 bike parking facilities within the retail zone
  - Level 3:
    - 179 tenant bike spaces, made up of 135 dual bike parking / storage lockers and 44 vertical bike lockers; and
    - 12 visitor bike rack spaces.
- Service vehicle parking bays (ground level):
  - 2 Small Rigid Vehicle (SRV) loading bays;
  - 1 courier service bay (B99); and
  - 1 Metro Operational bay (B99).

4.2 Access Arrangement

The lobby entrance on Pitt Street will provide pedestrian access for South OSD residents and visitors, while retail tenancy can be accessed from Bathurst Street, adjacent to the Pitt Street Metro Station access, as shown Figure 4-1.

The Pitt Street South shared loading dock is proposed to have one right-in, one right-out only vehicle access point, located on Pitt Street, as shown in Figure 4-1. The access will lead to the loading area and be restricted to service and authorised vehicles only.

Cyclists will access the residential development through the shared loading dock via a dedicated cycle access door on Pitt Street as indicated in Figure 4-1, sharing with the loading access. Bicycle parking spaces have been provided on level 3 which is only accessible via the goods lifts adjacent to the loading dock as shown in Figure 4-2 and Figure 4-3. Cycling trips that are generated by the retail land use will use the public shared parking spaces on Bathurst Street and dedicated spaces on level 2 as shown in Figure 4-18.

Reflective of the shared loading dock and dedicated cyclist access design, safety measures have been proposed to mitigate any risks, particularly the on-street cyclists who travel in a northbound direction will ride across the vehicle access crossover from Pitt Street to access the development. The proposed design includes awareness improvements to minimise the risk, such as a warning system and convex mirror as per Refer to Figure 4-4. Alternative safety measures have also been explored including pivoting gates that stop pedestrians, alongside speed humps, with the preferred solution being convex mirrors and the use of flashing / audible lights.

This has been included as part of the Green Travel Plan in SMCSWSPS-AUR-OSS-PL-REP-000002.

A detailed hostile vehicle mitigation assessment has been undertaken separately as part of the Pitt Street Integrated Station Design and can be found within the overall Station SSDA application. (CSSI)

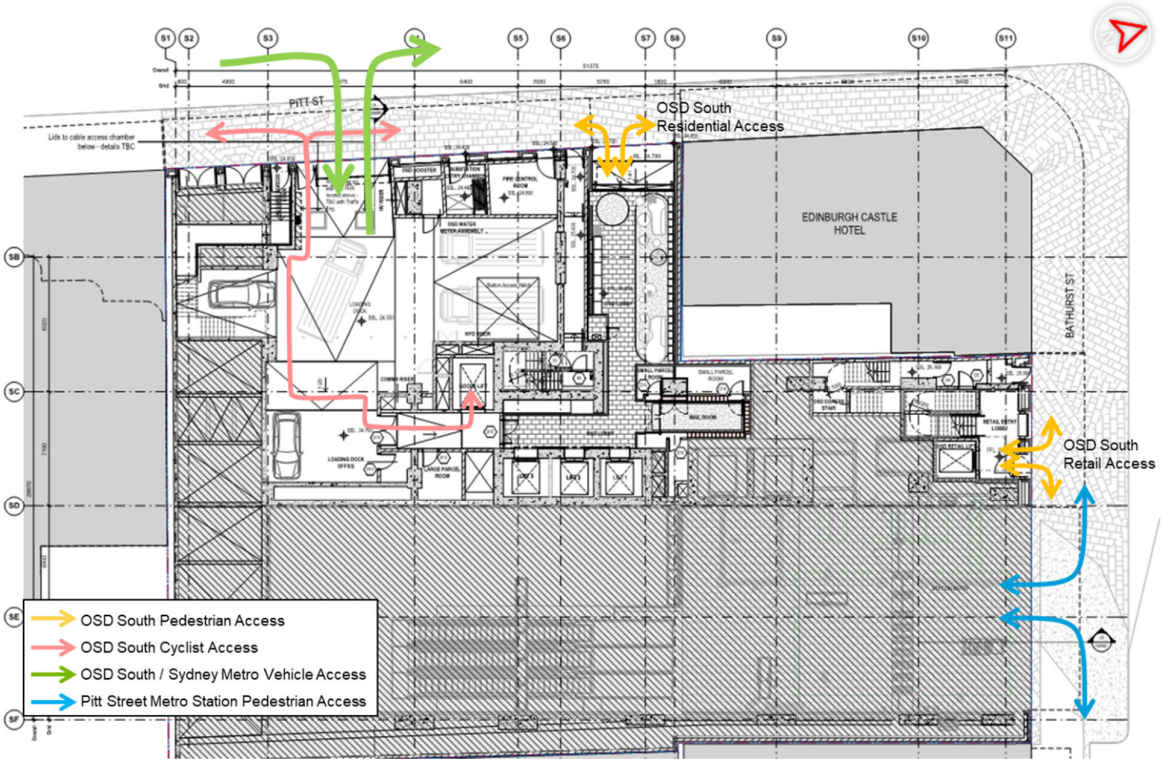


Figure 4-1: South OSD access locations on the ground floor (reference: Bates Smart)

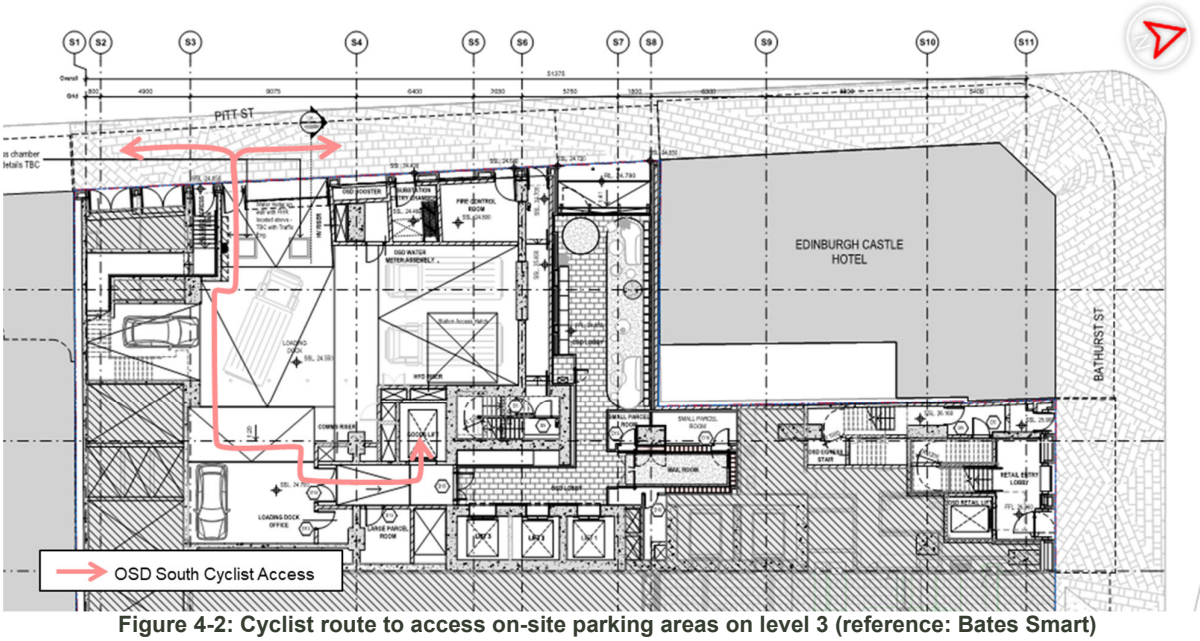


Figure 4-2: Cyclist route to access on-site parking areas on level 3 (reference: Bates Smart)

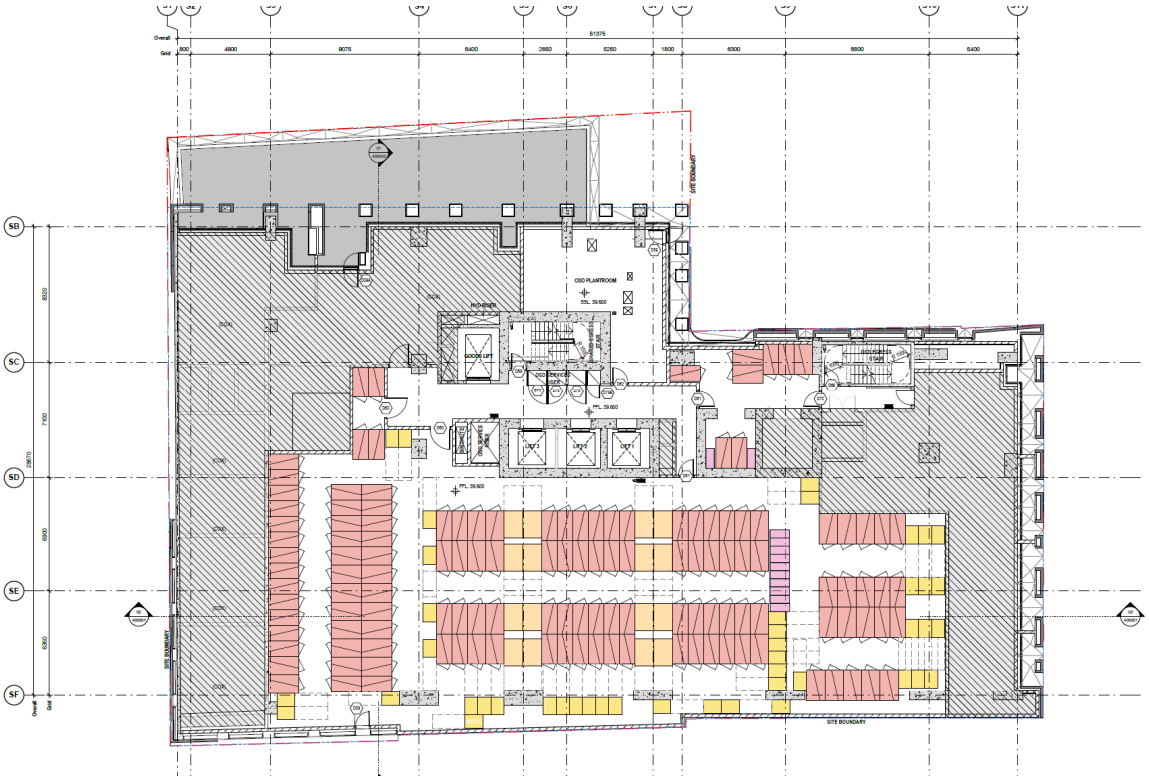


Figure 4-3: Cycle facilities on level 3 (reference: Bates Smart)

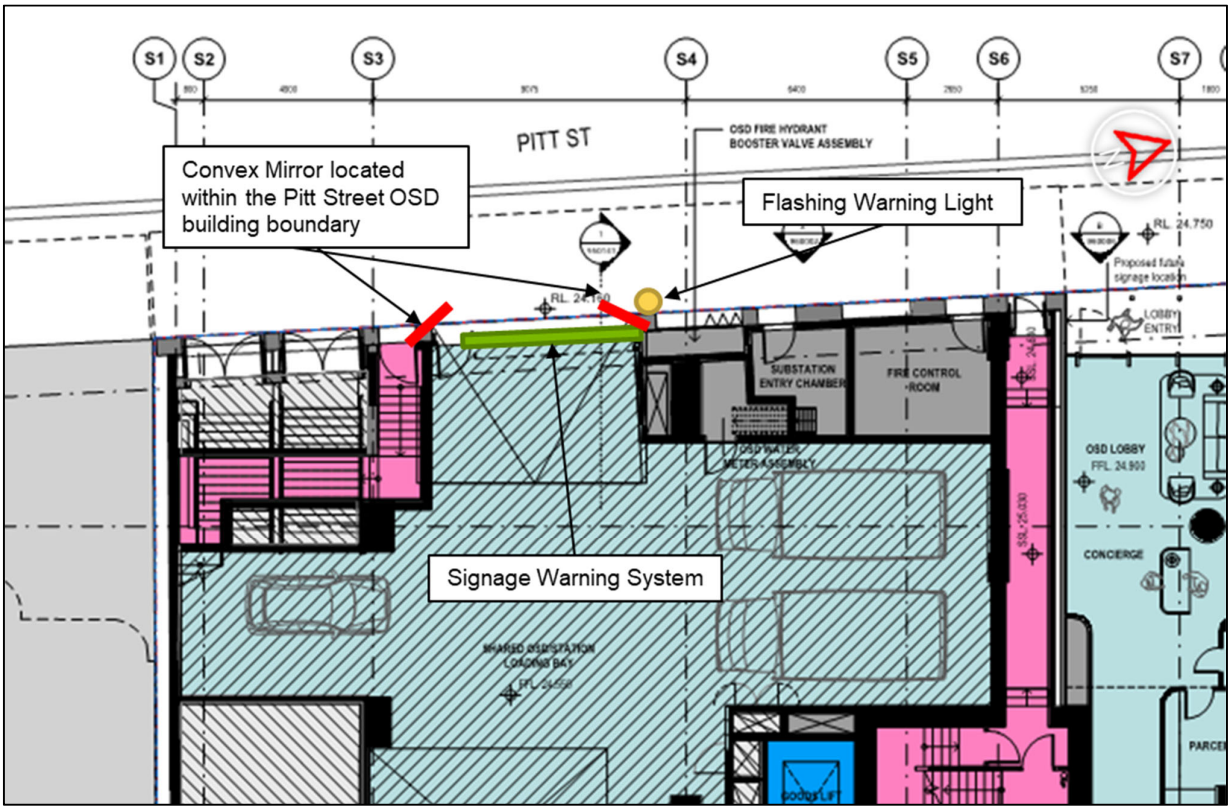


Figure 4-4: Suggested safety\measures at loading dock access (reference: SMCSWSPS-BAT-OSS-AT-DWG-930041 Rev: C)

4.3 Vehicle Parking Provision

The maximum car parking provision allowed for the South OSD development as per the Sydney LEP 2012 Section 7.5 (last updated on 29 November 2019), is summarised in Table 4-1 below.

Table 4-1: Maximum parking provision allowed

Land use	Unit design	Maximum parking rates	Proposed	Maximum parking provision allowed
Multi dwelling housing (Category A)	1 bedroom	0.1 spaces/ unit	110 units	11 spaces
	2 bedrooms	0.7 spaces/ unit	118 units	83 spaces
	3 or more bedrooms	1 space/ unit	6 units	6 spaces
Retail land use (Category D)	GFA	1 space per 90m^2	682m^2	7-8 spaces
			Total	**108 spaces**

As the site is surrounded by numerous multi-modal transport options as illustrated in Section 3.7 and 5.1, private vehicle usage by tenants is estimated to be minimal. The South OSD has been designed to integrate with the Pitt Street Metro Station (high service frequency, with services every 3 minutes) sitting directly beneath the site, which will significantly improve the accessibility to public transport. Furthermore, the South OSD is expecting tenants that will utilise sustainable travel options (public transport and active transport) as their primary transport mode without owning a private vehicle, while their occasional vehicle transport needs can be accommodated by taxi / ride-share, car share (see Section 3.7.7) and car rental (see Section 5.7) in the vicinity, as well as the nearby available public parking facilities (see Section 3.4). Encouraging active transport usage is further documented as part of the Green Travel Plan in Appendix A.

As a result, South OSD has excluded any tenant / visitor vehicle parking provision within the development, in order to encourage more sustainable transport choices. This means that the development is below the maximum 108 vehicle parking spaces allowed.

4.4 Loading Dock and Service Vehicles

The South OSD loading dock will provide a total of four on-site service vehicle bays with the bays designed to mainly accommodate the vehicle types below:

- 2 x Small Rigid Vehicle (SRV); and
- 2 x light commercial vehicles (B99, 99th percentile of class of cars).

It is understood the Sydney LEP 2012 has been referred as the main policy for the site to comply with. However, as no specification for service vehicle parking provision is outlined in the Sydney LEP 2012, the developments loading capacity has been determined by reviewing the recommendations from the Sydney Development Control Plan (DCP) 2012 to ensure adequate spaces are provided on site without any adverse impact onto the external road network. According to the Sydney DCP 2012 Schedule 7.8.1, the recommended service vehicle parking provision is as summarised in Table 4-2.

Table 4-2: Minimum service parking provision

Land use	Service vehicle parking rates	Proposed	Minimum service parking provision required
Residential	1 space for the first 50 dwelling units	50 units	1 space
	0.5 spaces for every 50 dwelling units or part thereafter	184 units	2 spaces
Shop	1 space per 350m^2	682m^2	2 spaces
		Total	**5 spaces**

Allocation of spaces is as follows;

- One of the spaces (light commercial vehicle B99) will be allocated for Pitt Street Metro Station uses only. Sydney Metro assessed the station loading and servicing needs and the result of this assessment was for one light commercial vehicle.
- The remaining three delivery spaces are for servicing retail and residential requirements of OSD South.

Based on the service loading for South OSD retail requiring a minimum of two loading bays, it has been determined that the current arrangement provides sufficient capacity to meet the loading requirement for retail. Furthermore, there is only one retail tenancy proposed.

As the loading dock is shared between retail and residential (noting the development is a build-to-rent), the residential loading will be managed by the onsite loading dock manager to manage retail and residential loading peak times for example, the use of the loading dock by the residential tenants will be booked in through the dock manager to reduce the potential for conflict.

Residential usage of the loading dock is likely to occur by the resident, for example prior to hiring a furniture removalist vehicle, or by a furniture removalist company (noting that the booking to use the loading dock will still be made by the resident) who has access to a furniture removalist vehicle. All future residents will be advised within their welcome pack that the loading dock can only cater to a maximum SRV sized vehicle which is no greater than a 6.4m sized vehicle in overall length and 3.3m in overall height. As more than 97% of dwellings are 1- or 2-bedroom apartments and aimed at the rental market it is considered that the majority of residents moving in or out of the complex would require smaller trucks and are likely to choose to move themselves, due to more frequent need to move than if home owners. Although furniture truck sizing can vary, for non-specialist furniture removal, SRV trucks are the largest vehicles that can be hired under a standard driver's licence. Therefore a SRV size vehicle is likely to be the most common form of removal truck used by residents.

The *TfNSW – Sydney Coordination Office of Planning and Freight* undertook a quantitative study and assessment (Pitt Street North Docking Activity Assessment) of the potential demands for the Pitt Street North OSD loading facilities that are located as shown in Figure 4-5, and the analysis was undertaken on 280 dwellings units and 1,500 m^2 of commercial land use. This development would have similar operation to the proposed South OSD in that it has similar site characteristics, and will also be integrated with the Pitt Street Metro Station. The assessment has forecast the service arrival profile and potential bays required as shown in Figure 4-6 and Figure 4-7 respectively. From the forecast profiles, it is identified that that the maximum loading bays required are less than four bays (approximately 3.3 bays), with a peak demand of 8 vehicles / hour. It should be noted that the residential dwellings (234 units) and retail area (682m^2) for South OSD are less than the assessment assumptions making the OSD South loading dock appropriately designed to meet the typical loading demand.

Therefore, the loading bay provision within South OSD is considered adequate to service the typical activities or the residential tenants and retail tenants' requirements.

Figure 4-5: Pitt Street OSD (source: Pitt Street Over Station Development – Concept State Significant Development Application – Environmental Impact Statement Overview, 23/08/2018)

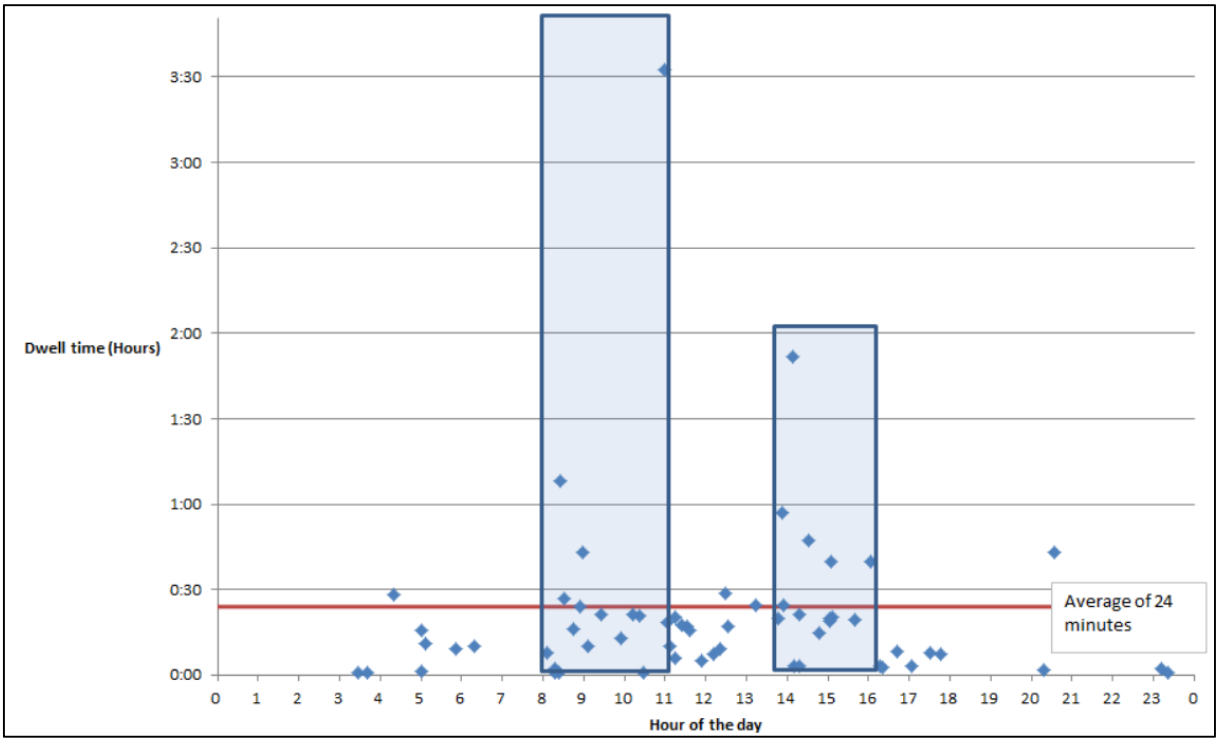


Figure 4-6: Forecast hours of loading dock activity profile (source: Pitt Street North Dock Activity Assessment – Draft Version 2, 9 April 2018)

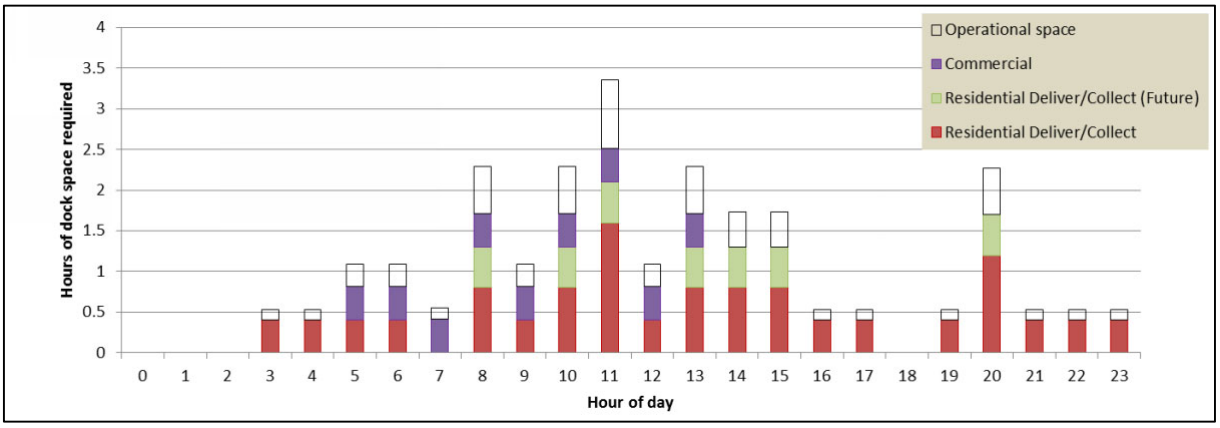


Figure 4-7: Forecast loading bay occupancy (source: Pitt Street North Dock Activity Assessment – Draft Version 2, 9 April 2018)

The loading dock is estimated to be receive the following services via those bays, but not limited to:

- Grocery deliveries (regularly);
- Goods deliveries for retail (weekly);
- Furniture delivery (prior to opening and rarely occur after opening);
- Waste collection (daily);
- Cleaning and maintenance service (regularly);
- Building maintenance service (occasionally);
- Mail and parcel delivery (irregular and non-manageable); and
- Metro transformer replacement service (emergency).

A Delivery Service Plan for South OSD has been included in Appendix A which summarises the key elements relevant to the Stage 2 SSD DA submission.

4.4.1 Swept Paths Analysis

Access from Pitt Street into the propose shared loading dock is via forward in and forward out movements. Swept path analysis has been undertaken to assess a 5.2m length B99 vehicle and a 6.4m length SRV.

Figure 4-8 to Figure 4-10 illustrates the proposed loading dock design can adequately accommodate the proposed vehicle movements to service the loading dock. To accommodate an SRV accessing the western loading bay (bay 1) the vehicle will be required to undertake a three-point turn to exit forward out. This is considered acceptable as there is sufficient visibility for driver and the movement can be achieved. The swept paths show that the vehicles do not require more than three points turn to manoeuvre in and out from the bays. It should be noted that the Pitt Street Metro Station vehicle (B99) is able to reverse into the allocated parking area when the loading bays are vacant.

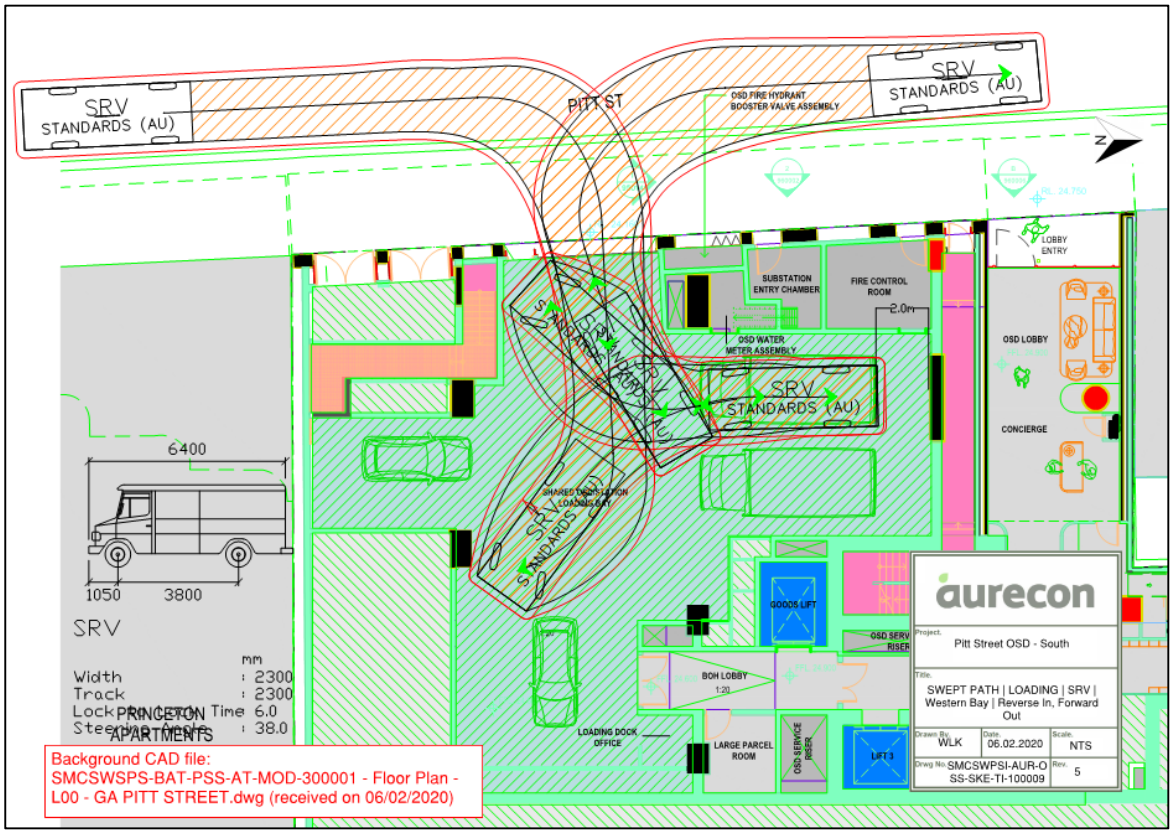


Figure 4-8: Vehicle swept path analysis for the SRV western bay – reverse in and forward out from loading bays (once inside loading dock)

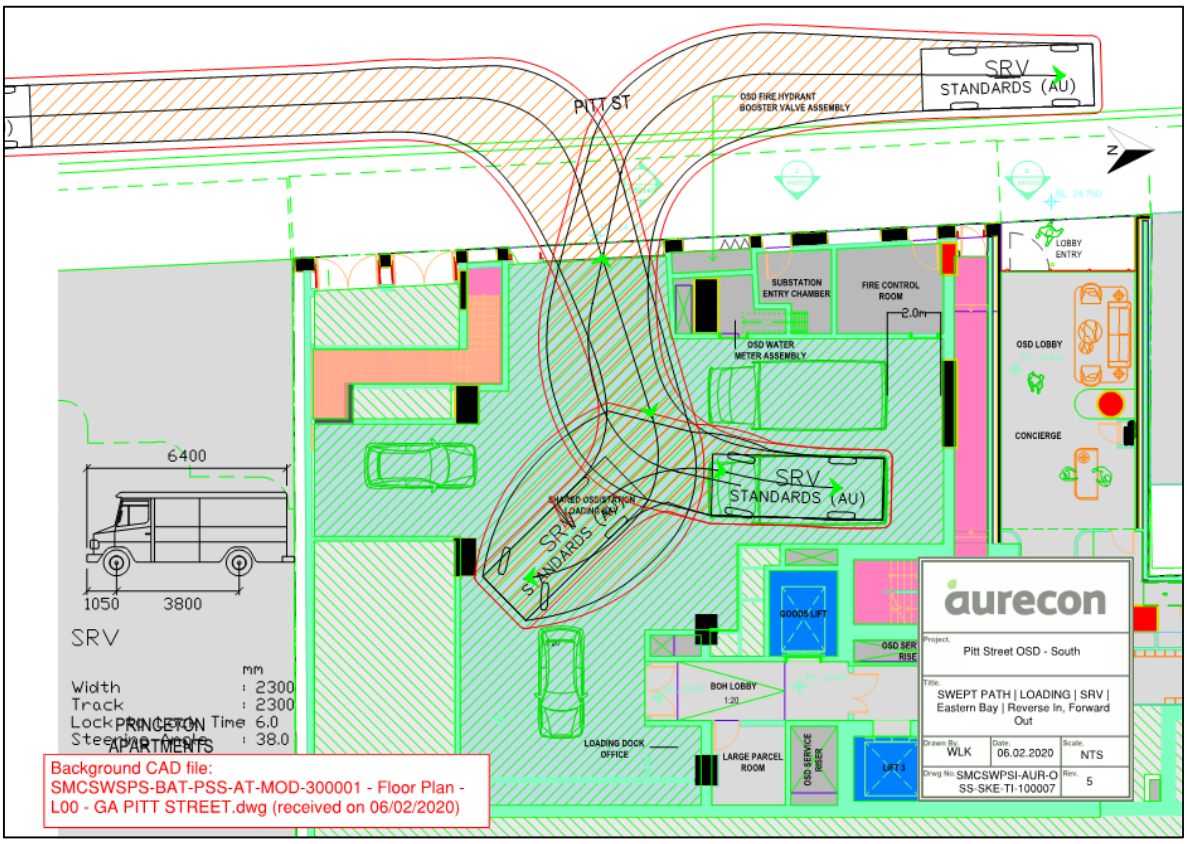


Figure 4-9: Vehicle swept path analysis for the SRV Eastern Bay – forward in and reverse out from loading bays (once inside loading dock)

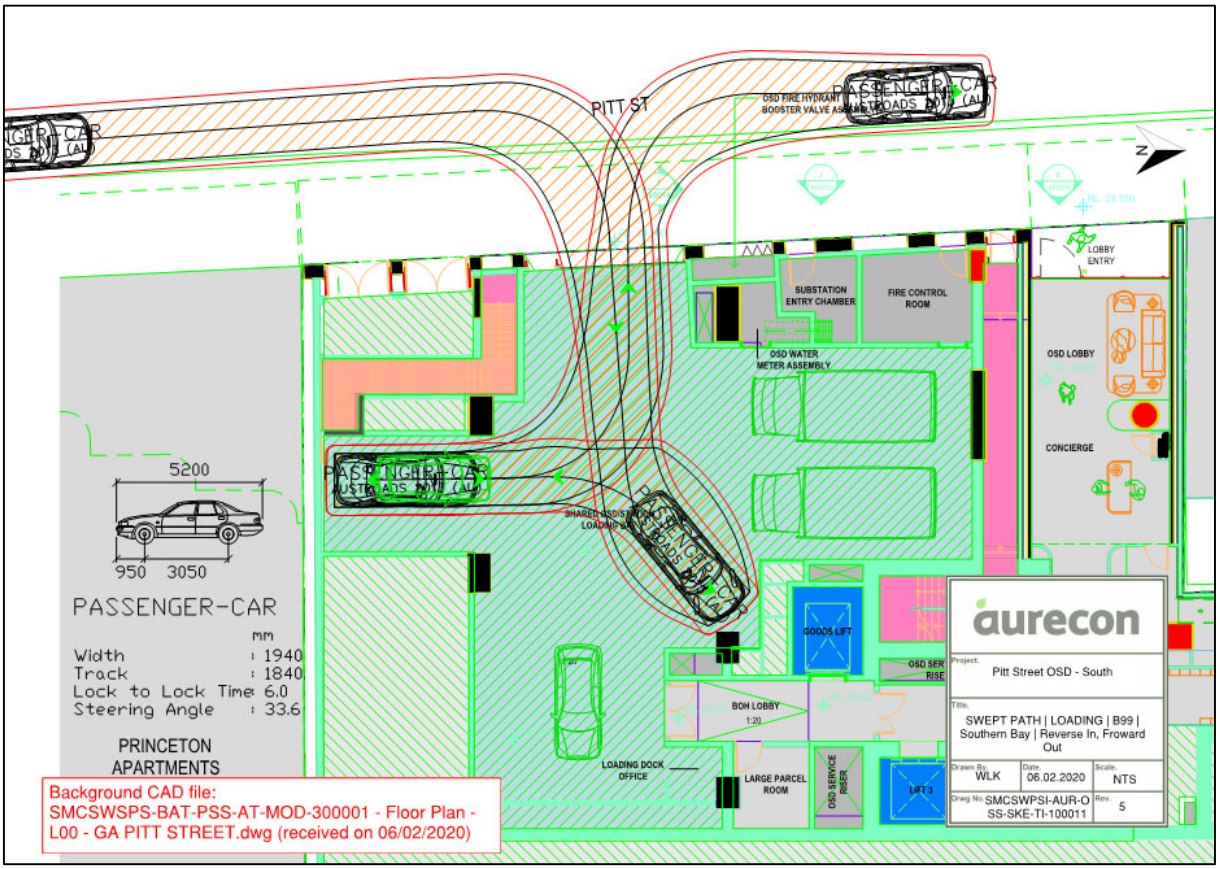


Figure 4-10: Vehicle swept path analysis for the B99 southern service bay – forward in and reverse out from the loading bays (once inside loading dock)

Vertical Clearance for Vehicle Access into the Loading Dock

Figure 4-11 illustrates a vertical swept path associated with an SRV sized vehicle accessing the loading dock. The maximum length of an SRV vehicle is 6.4m and height is 3.3m. Clearance into the loading dock is limited to 3.5m meeting the minimum AS 2890.2 requirements.

As recommended in AS2890.1:2004 – Parking Facilities Part 1: Off-street car parking, a minimum of 2.2m height between floor and any overhead obstruction is required for standard passenger vehicles and light vans. The stair adjacent to the B99 southern service bay has a headroom of approximately 2.6m height as shown in Figure 4-12, which is the limiting headroom within the loading bay area. Therefore, the design is considered to provide sufficient headroom clearance.

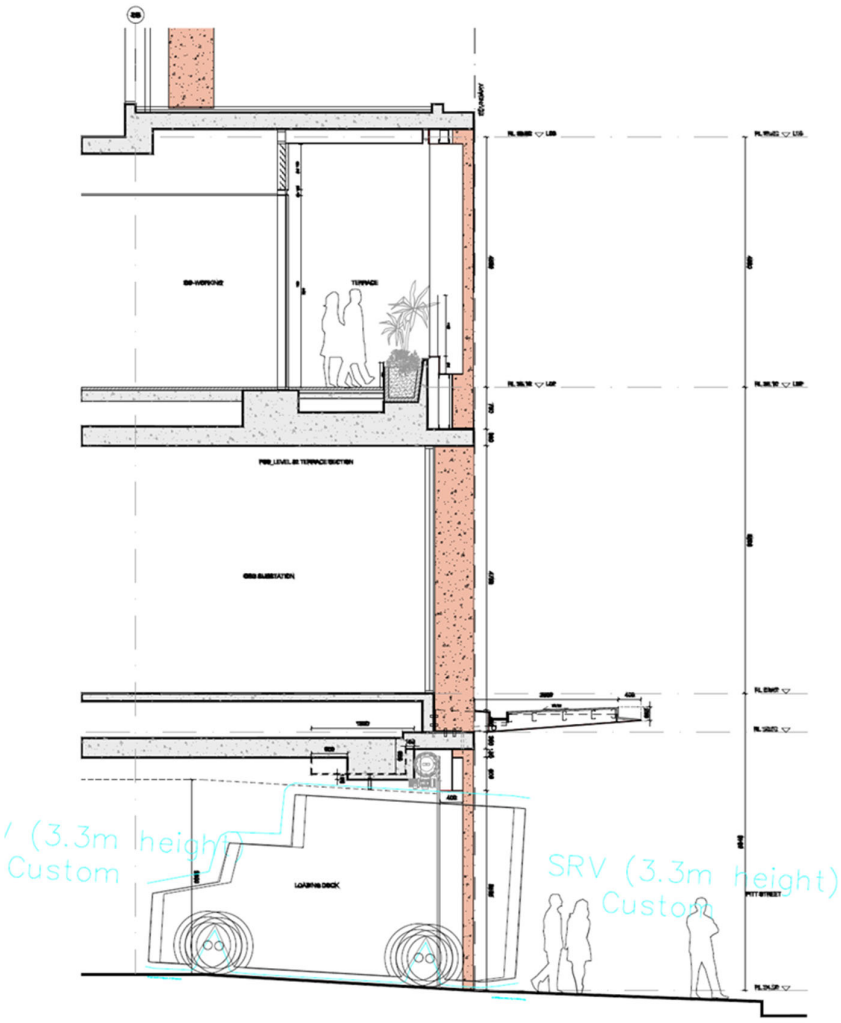


Figure 4-11: Pitt Street South Vertical Swept Path into the loading dock (reference: Bates Smart)

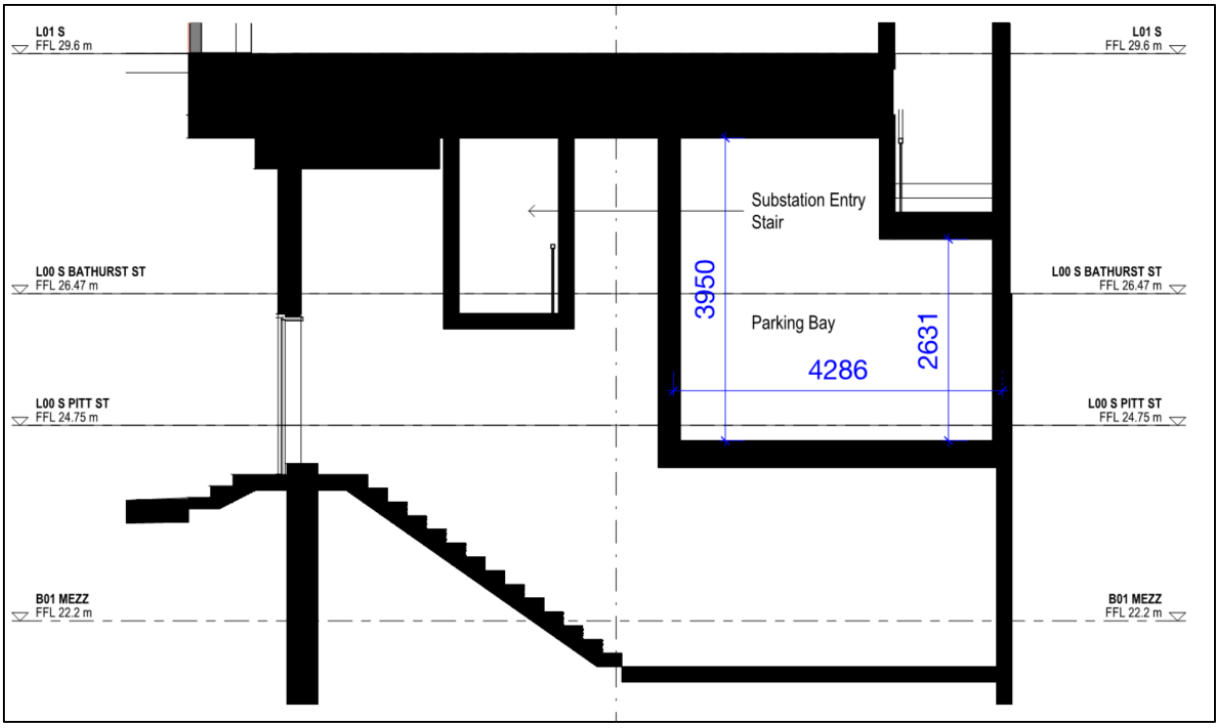


Figure 4-12: Cross section A elevation view between level B01 Mezz and level L01 (reference: Bates Smart)

4.4.2 Sydney Metro Station Loading Requirements

Sydney Metro has assessed the Pitt Street South Station loading and servicing needs and the result of this assessment was for one dedicated light commercial vehicle (B99) which has been provided. The Sydney Metro Operation bay (refer to Figure 4-13 highlighted green) will be occasionally occupied to undertake maintenance services for the Pitt Street Station. Swept path movements in and out of the Sydney Metro bay is shown in Figure 4-14. For the service occasion that requires major possession, for example a transformer replacement, the possession will be undertaken outside of peak periods and on street level due to the limited height space within the loading dock. This limited height is due to the combined height of a MRV / SRV truck and the station transformer. However, such services are extremely rare, and the operation will be well planned for prior to service to ensure the impact on the surrounding can be kept at minimal.

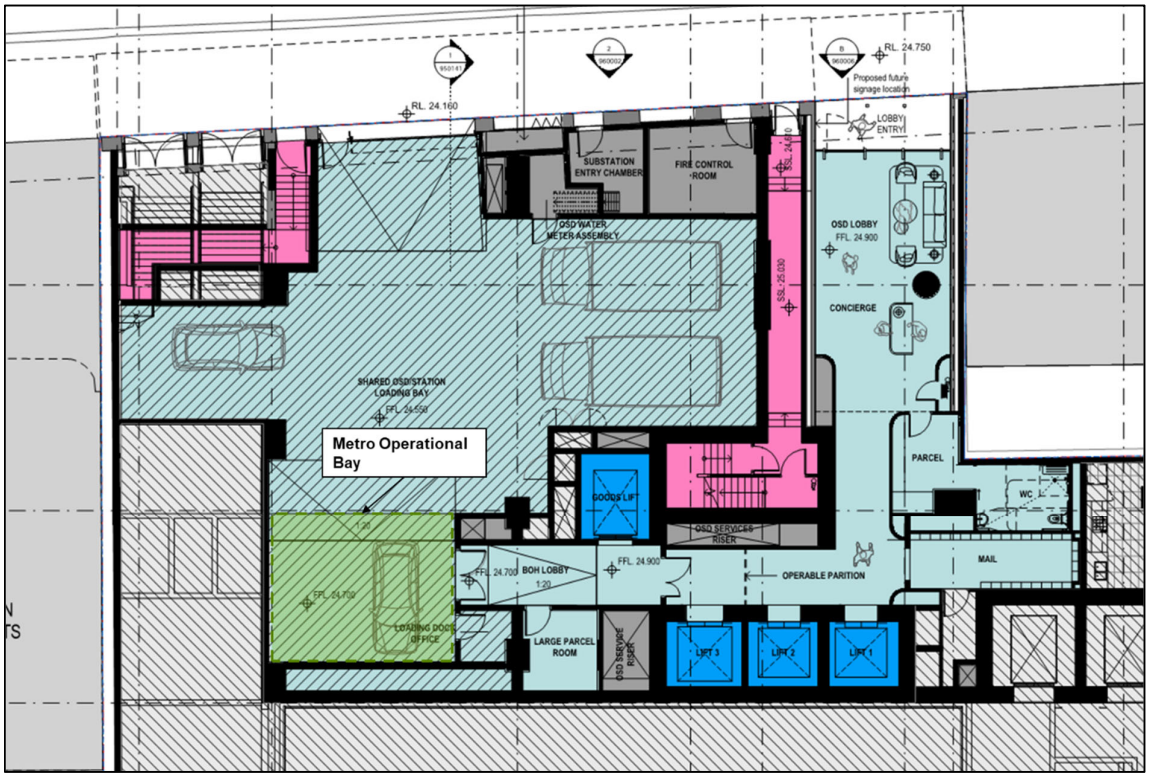


Figure 4-13: Metro operational bay within the shared loading dock area (reference: Bates Smart)

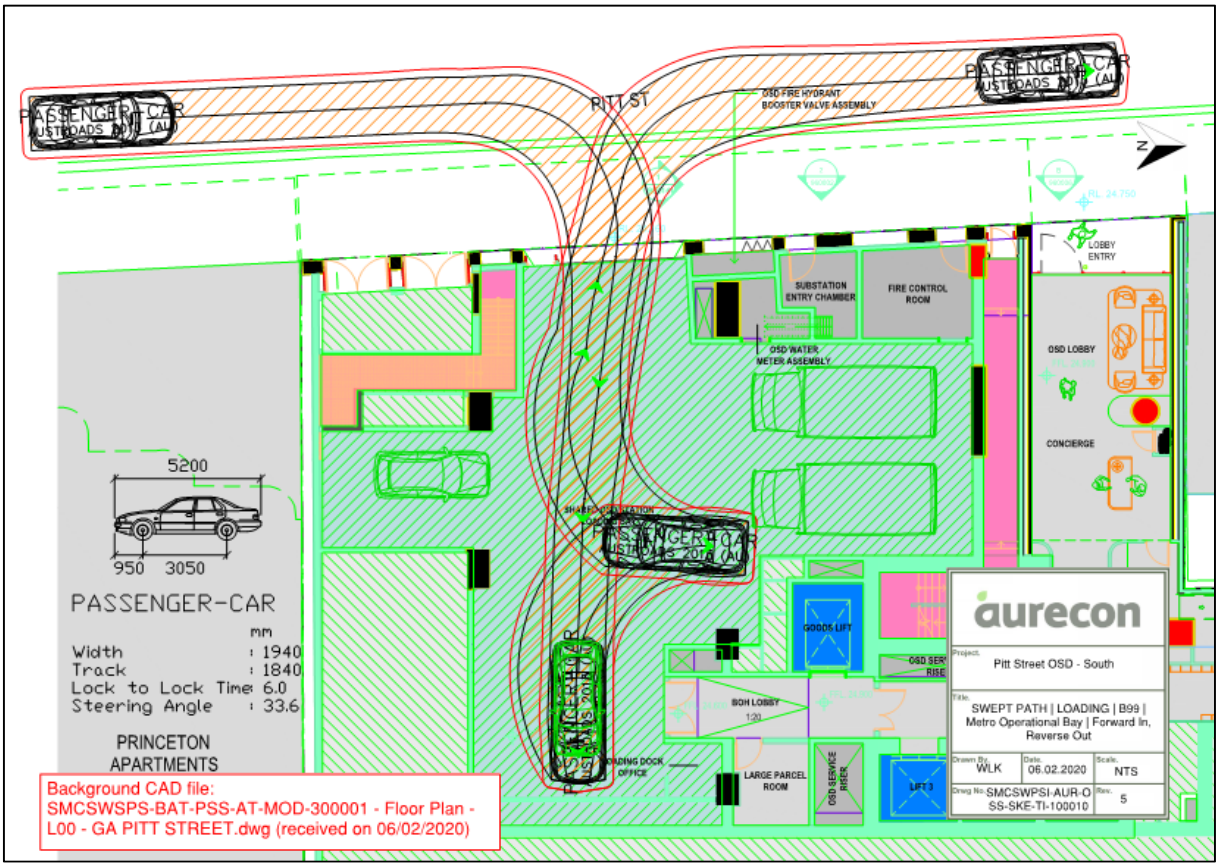


Figure 4-14: Vehicle swept path analysis for the B99 Sydney Metro service bay – forward in and reverse out from the loading bays (once inside loading dock)

4.4.3 Waste Collection

A detailed Waste Management Plan prepared by TTM can be found in SMCSWSPS-TTM-OSS-PL-REP-000001. As outlined within the Waste Management Plan, refuse collection will be undertaken by private collectors on-site within the loading dock using small rigid vehicle (SRV) with a typical frequency of 3 to 7 collections per week. Waste vehicles are anticipated to use both the SRV loading bays to undertake waste collection and a vehicle swept path articulating this is shown in Figure 4-15.

As referenced within the Waste Management Plan prepared by TTM (refer to document SMCSWSPS-TTM-OSS-PL-REP-000001), 2.0m clearance is recommended to be provided from the northern wall within the shared loading dock to the SRV loading bays, and the swept paths into the individual loading bays (once inside the loading dock) should be undertaken in reverse-in and forward-out movements. As noted, waste collection for the OSD residential and retail will be via a private waste contractor.

To accommodate the waste vehicle movement into the loading bays, two bays (bays 1 and 2) will be required to be occupied. In this situation the vehicle will not be restricted by the dedicated parking lines. Access will also be restricted while waste collection is being undertaken on the site. All activity will be managed by the loading dock manager and outlined within the Delivery Service Plan. Once parked a 2.0m clearance has been allowed for behind the waste vehicle. Access to the South OSD waste storage / refuse is shown in Figure 4-16. Further information on the operations associated with waste is outlined in the Waste Management Plan.

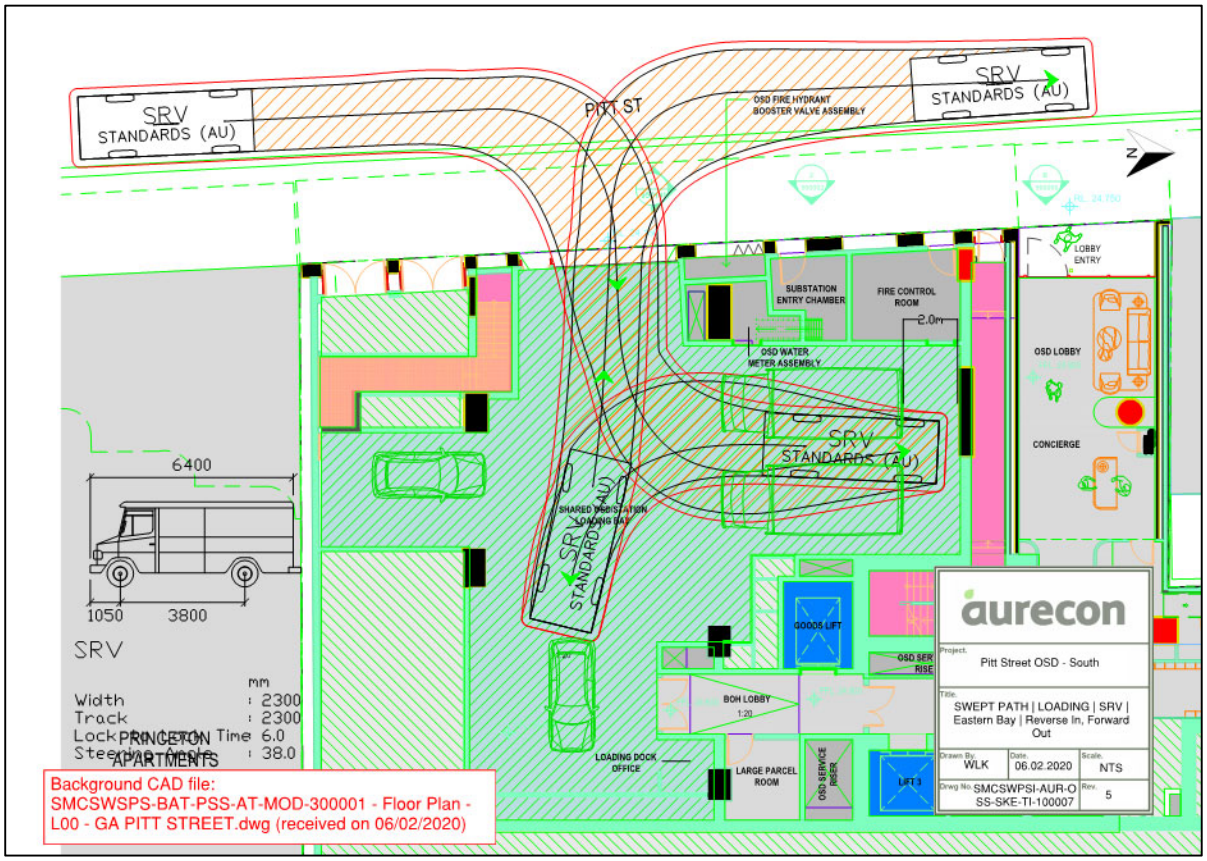


Figure 4-15: Vehicle swept path analysis for the SRV eastern bay during waste collection – reverse in and forward out from loading bays (once inside loading dock)

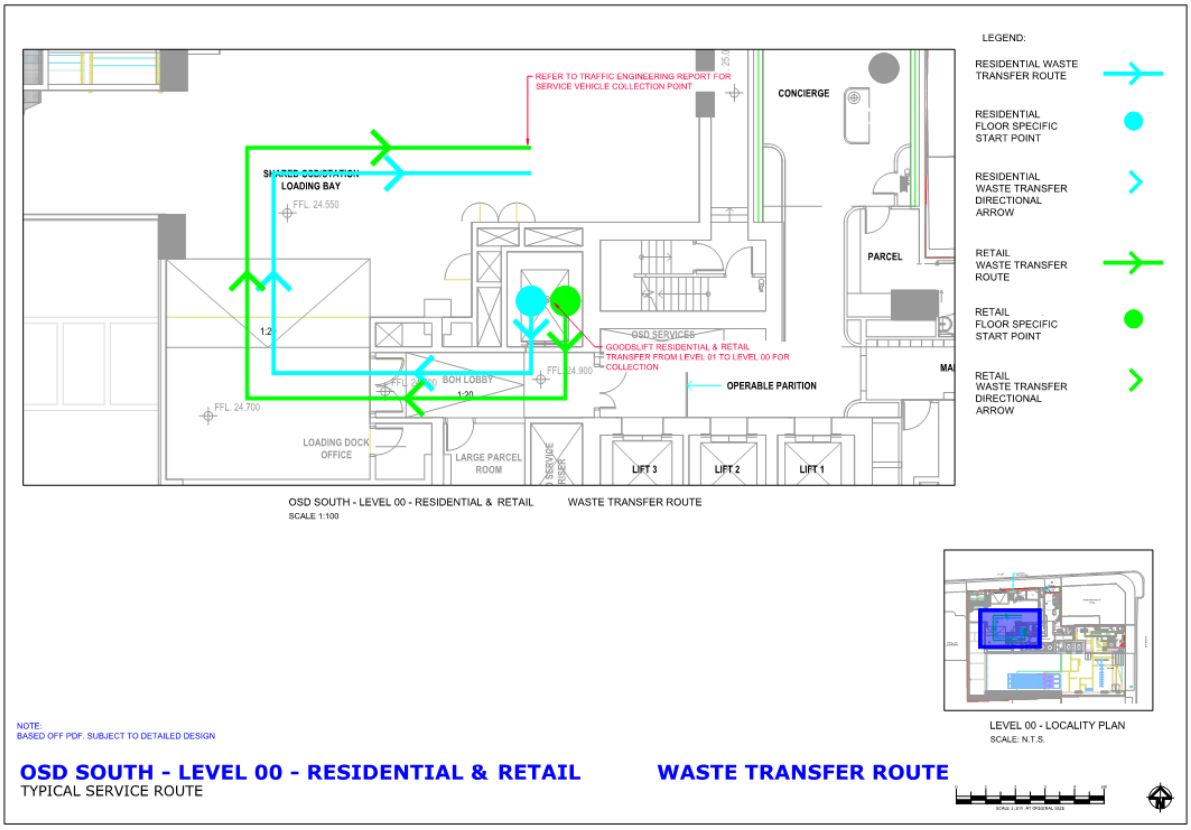


Figure 4-16: Waste Transfer Route – extract from the Waste Management Plan for LOC (Reference: SMCSWSPS-TTM-OSS-PL-REP-000001-B)

4.5 Bicycle Parking Facilities

It is understood the Sydney LEP 2012 has been referred as the main policy for the site to comply with. As no specification for bicycle vehicle parking provision is outlined in the Sydney LEP 2012 , the City of Sydney Design Control Plan (DCP) 2012 has been reviewed to assess the bicycle parking provisions required for the South OSD development (refer to Table 4-3). In assessing the minimum requirements, it should be noted the DCP minimum requirements have been created for a traditional residential Build to Sell (BtS) apartment building which is different to a Build-to-Rent (BtR) apartment building operationally. A BtR development is specifically designed as a rental development and owned and operated by a unified management. The South OSD development has been designed to comply with Greenstar requirements, as described in SMCSWSPS-CUN-OSS-PL-REP-000001 and SMCSWSPS-CUN-OSS-PL-REP-000002 which have been submitted as part of the overall development application and SSDA submission.

Table 4-3: Sydney DCP 2012 bicycle parking provision required

Land use	Bicycle parking space rates	Proposed	Minimum service parking provision required	Proposed Provision
Residential	Residents – 1 per dwelling	234 units	234 space	**Level 2:** 12 dedicated bike parking spaces within the retail zone **Level 3:** 135 dual bike and storage cages, 44 vertical bike lockers, and 12 visitor bike spaces
	Visitor – 1 per 10 dwellings		24 spaces	
Shop	Employees – 1 per 250m^2	682m^2	3 space	
	Customers – 2 plus 1 per 100m^2		9 spaces	
		Total	**270 spaces**	**203 spaces**

The South OSD provides 203 bicycle spaces within the development of which the 191 cycle facilities located on Level 3 are shown in Figure 4-17 and Figure 4-18. The remaining 12 dedicated parking spaces are located within the retail zone on Level 2. The South OSD has a shortfall of 67 spaces (55 tenant and 12 visitor spaces) compared to the DCP bicycle parking requirements outlined in Table 4-3. However, considering that there are no specific DCP requirements for a BtR facility, and as noted in SMCSWSPS-CUN-OSS-PL-REP-000001 and SMCSWSPS-CUN-OSS-PL-REP-000002 compliance with the Greenstar requirements have been achieved. An overview of BtR provisions can be found within the following document. (SMCSWSPS-OXF-OSS-PL-REP-000001)

In addition to the visitor bike parking provided within the development on level 2 and 3, visitors to the South OSD building will be able to utilise the 10 off-site bicycle parking spaces on the south of Bathurst Street (see Figure 4-18) that will be shared between the development and the general public / adjacent developments. Hence, the South OSD is considered to have adequate visitor bicycle parking provision and complies with the Greenstar requirements.

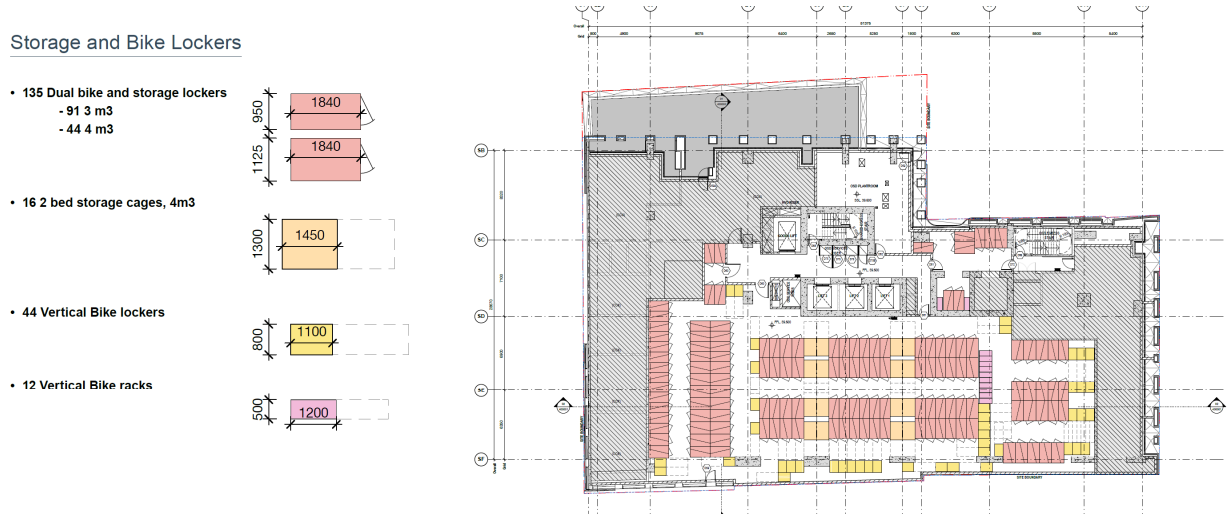


Figure 4-17: On-site bicycle parking provision on level 3 (Reference: Bates Smart)

Access to the tenant cycling storage facilities is via the loading dock where a safe path of travel. This is shown in Figure 4-19.

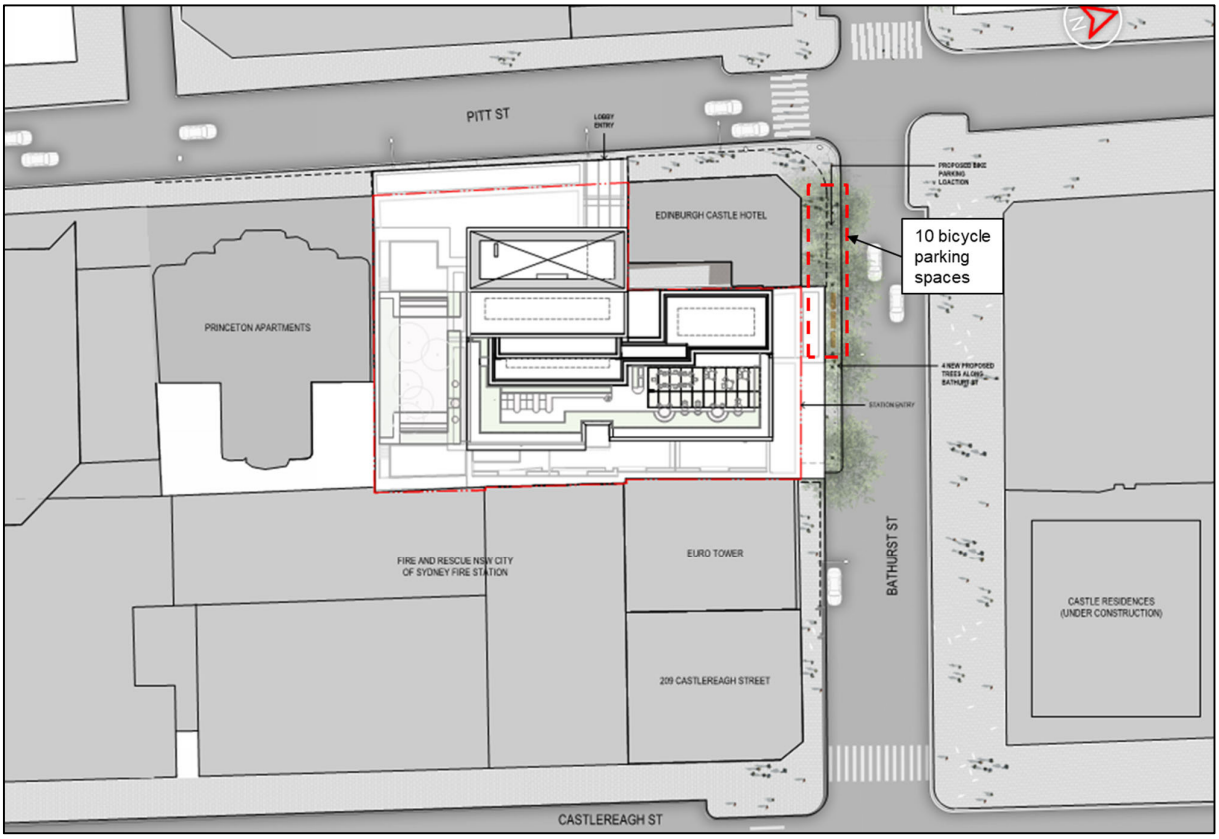


Figure 4-18: On-street public bicycle parking provision (Reference: Bates Smart)

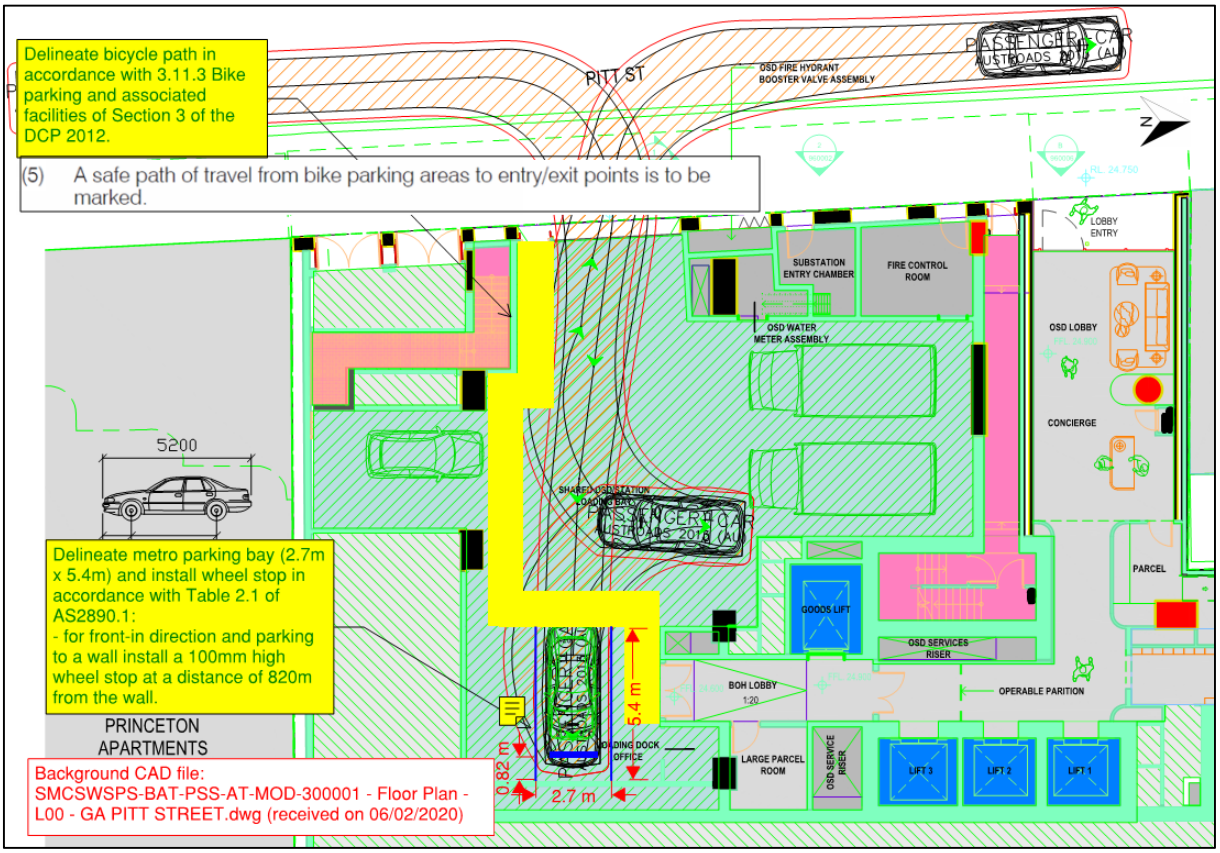


Figure 4-19: Bike parking access proposed via the loading dock (dedicated door)

5 Transport Assessment

This section outlines the discussions on the transport impact resulting from the development, as well as the integration with the surrounding transport infrastructure.

5.1 Mode Share

The potential mode share for the site is likely to have similar mode splits as the current trend observed in the surrounding developments, however, it is estimated to fluctuate in association with the development infrastructure (i.e. vehicle and bicycle parking provision) and future proposed changes (i.e. public transport accessibility and frequency). While it is noted that the active and public transport facilities within the City of Sydney have been well developed, these are constantly improving to match the growth in demand and to maintain high usage and reliability.

With the existing parking provisions and restrictions within the CBD, people are encouraged to travel in and around Sydney via sustainable transport, as evidenced by the ABS 2016 Census data (see Section 3.7), where a considerably high proportion of commuters (88%) who live within Sydney are using sustainable transport to travel to work, which includes bus (11%), train (25%), tram (1%), ferry (<1%), walk (50%) and bicycle (1%). While the remaining 12% of commuters travel to work via private vehicle or taxi.

The site is surrounded and accessible to numerous public transport facilities and sustainable transport options. It is noted that currently some of the facilities that have been identified are outside the comfortable walking distance (400m), these can still be accessed via other intermediate public transport services such as train, bus and tram to reduce the walking distance. Additionally, the development has provided a significant amount of bicycle parking spaces and lockers for tenants to encourage cycling. Thus, a similar transport mode share as the current trend (high usage of public and active transport) can be estimated from the South OSD.

It should be noted that the new Pitt Street Metro Station that sits beneath the site and the new Sydney CBD and South East Light Rail (see Figure 3-16) in close proximity will increase the coverage and accessibility to public transport such as by replacing the needs on intermediate travel mode based on existing infrastructure.

As no parking will be provided within the South OSD development, the mode share for car as a driver is estimated to be generated from occasional use for specific trips, via car share (see Section 5.6) and car rental (see Section 5.7). The proportion is, however, anticipated to be considerably less than the current trend (9%). This reduction is likely to shift towards the public transport, given the high accessibility available at the site.

Similarly, the primary transport mode for visitors and customers are likely to be via sustainable transport, with a similar mode share as work trips. However, travel by private vehicle is likely to be slightly higher, given the visitors and customers might not be accustomed and familiar with the surrounding infrastructure, in particular for people who lived outside the City of Sydney. The proportion is estimated to be not substantial in comparison with overall transport demand from the development, where it is surrounded by good sustainable transport facilities.

Overall, with the parking control planned in the vicinity (maximum parking rates recommended by the Sydney LEP 2012) and the very high accessibility to public transport and walkable destinations, a substantial proportion of work trips generated by the South OSD development are estimated commute via public transport and active travel modes.

5.2 Traffic generation and road network impacts

As the development will not include any tenant / visitor parking provision, it is expected the site to only generate traffic from the loading dock and pick-up and drop-off trips. As discussed in Section 4.4, the development is forecast to generate approximately 8 service trips / hour during the loading dock peak periods.

The pick-up and drop-off demand is unlikely to be substantial, given the ABS 2016 Census indicated only 2% of commuters who lived within Sydney arrive at work via car as a passenger. This equates to approximately 8 trips to be generated from the development during peak periods, assuming one person per bedroom. It is understood that the pick-up and drop-off trips can be generated by multi-trip purposes from the South OSD (i.e. visitors, shoppers etc), the trips are, however, believed to be insignificant given the surrounding alternative transport options available, particularly in the typical weekday peak periods where public transport will be operating at its peak frequency, and high traffic congestion will place significant time penalties on private vehicle travel. Therefore, it is assumed the development will only generate approximately 8 – 16 pick-up and drop-off trips during the peak periods.

Based on the above assumptions and estimated activities, the South OSD is estimated to only attract and generate approximately 16 – 24 vehicle trips during the peak hours. This level of traffic generation is highly unlikely to have any substantial impact on the surrounding road network.

5.3 Pedestrian Assessment

The existing and potential future pedestrian infrastructure within Sydney CBD is as illustrated in Section 3.7.6. As most of the trips generate from the site is estimated to be via walking or alternative transport required to walk from/to the site (see Section 5.1), the pedestrian demand is therefore estimated to be the main generator directly from the development.

According to the RMS Guide to Traffic Generating Developments, it is estimated that the proposed development (high density residential within Sydney Metropolitan Area) will generate approximately 739 trips during weekdays and 110 trips in the peak periods, with daily trip rates of 2.05 persons per bedroom and peak hour trip rates of 0.3 persons per bedroom.

A modelling assessment was initially undertaken by Metron and updated by Aurecon to reflect the latest station and precinct design to analyse the potential impact. The assessment was documented in the *Pedestrian Modelling Report*, dated 28 January 2020. The modelling assessment has included the pedestrian trip generation and movements that are likely to result from the Pitt Street Metro Station and OSD developments (including the North OSD and South OSD). The assessment had assumed the development to generate approximately 70 person trips during the analysed peak periods, and it is 40 person trips less than the current development design. The impact on the overall assessment results are, however, to be unsubstantial.

The pedestrian modelling assessment has included a review of the footpath capacity of the network within the vicinity of the Pitt Street Metro station. This includes the pedestrian entry / exit points within the South OSD development on Bathurst Street and Pitt Street.

The analysis has adopted a 2036 peak hour scenario with 0.85% annual background growth forecast from 2015 existing demands. The impact and operation conditions of the footpaths are measured as Fruin Pedestrian Level of Service (LoS) Criteria in two aspects; walkway and queueing, as illustrated in Table 5-1. The outputs were assessed against the design requirement of a minimum performance of LoS C. The Pedestrian Modelling report submitted as part of the Pitt Street Station SSDA (SMCSWSPS-AUR-ALL-TF-REP-000001) can be cross referenced for further information.

Level of service	Description (for queuing areas, walkways and stairways)
A	Free circulation.
B	Uni-directional flows and free circulation. Reverse and cross-flows with only minor conflicts.
C	Slightly restricted circulation due to difficulty in passing others. Reverse and cross-flows with difficulty.
D	Restricted circulation for most pedestrians. Significant difficulty for reverse and cross-flows.
E	Restricted circulation for all pedestrians. Intermittent stoppages and serious difficulties for reverse and cross-flows.
F	Complete breakdown in traffic flow with many stoppages.

Table 5-1: Level of service description (source: London Underground – Station Planning Standards and Guidelines 2012 Edition)

The outputs were assessed against the design requirement of a minimum performance of LoS C. The result outputs for the surrounding network are as presented in Figure 5-1 and Figure 5-2 for the AM peak and similarly Figure 5-3 and Figure 5-4 for the PM peak.

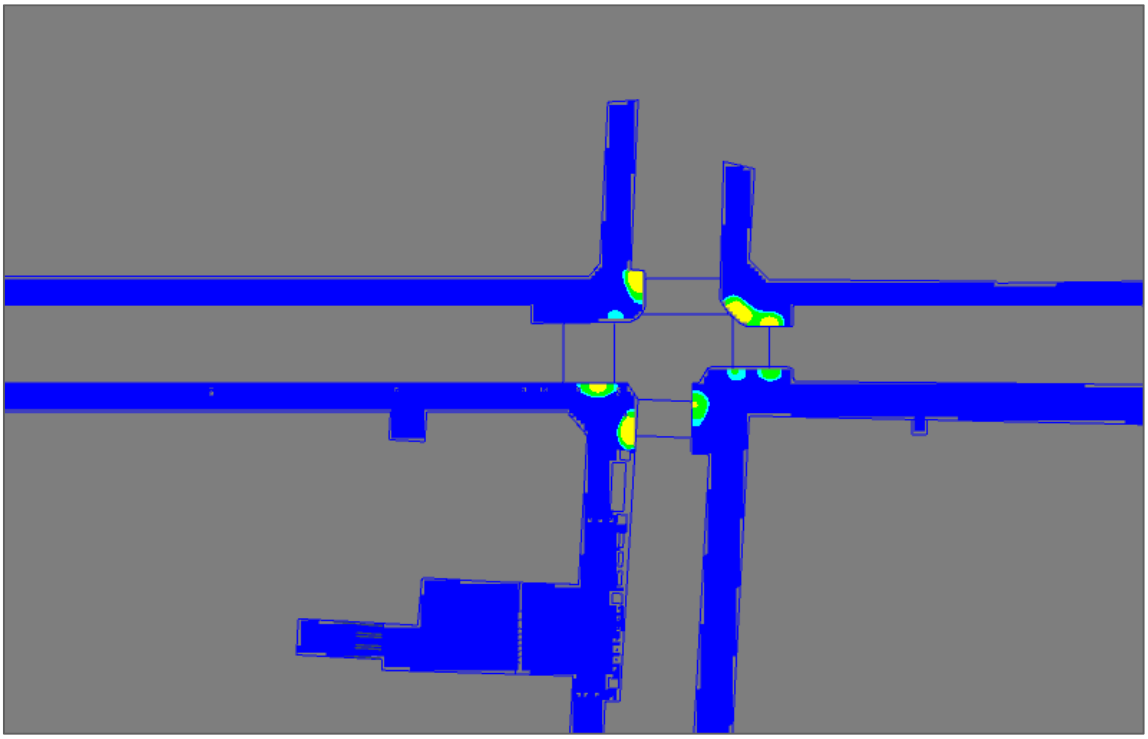


Figure 5-1: Pitt Street Precinct Area – Pitt St / Bathurst St Intersection Level of Service (2036 AM) - Fruin Queuing LoS Map

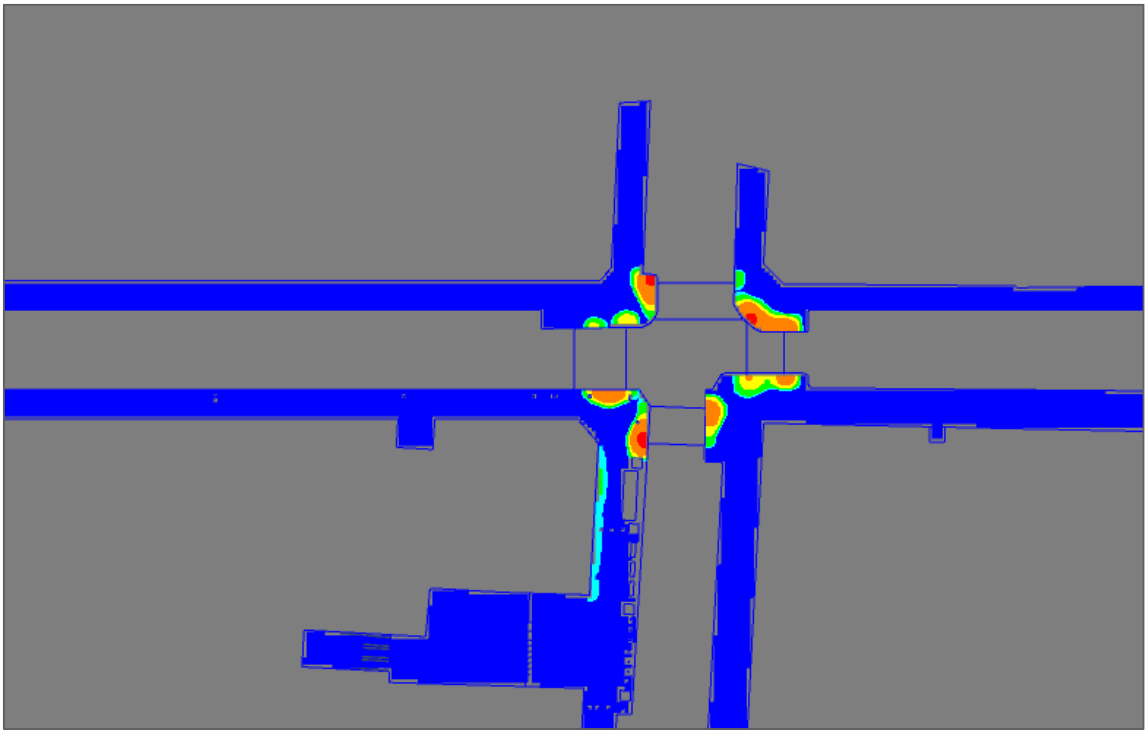


Figure 5-2: Pitt Street Precinct Area – Pitt St / Bathurst St Intersection Level of Service (2036 AM) - Fruin Walkways LoS Map

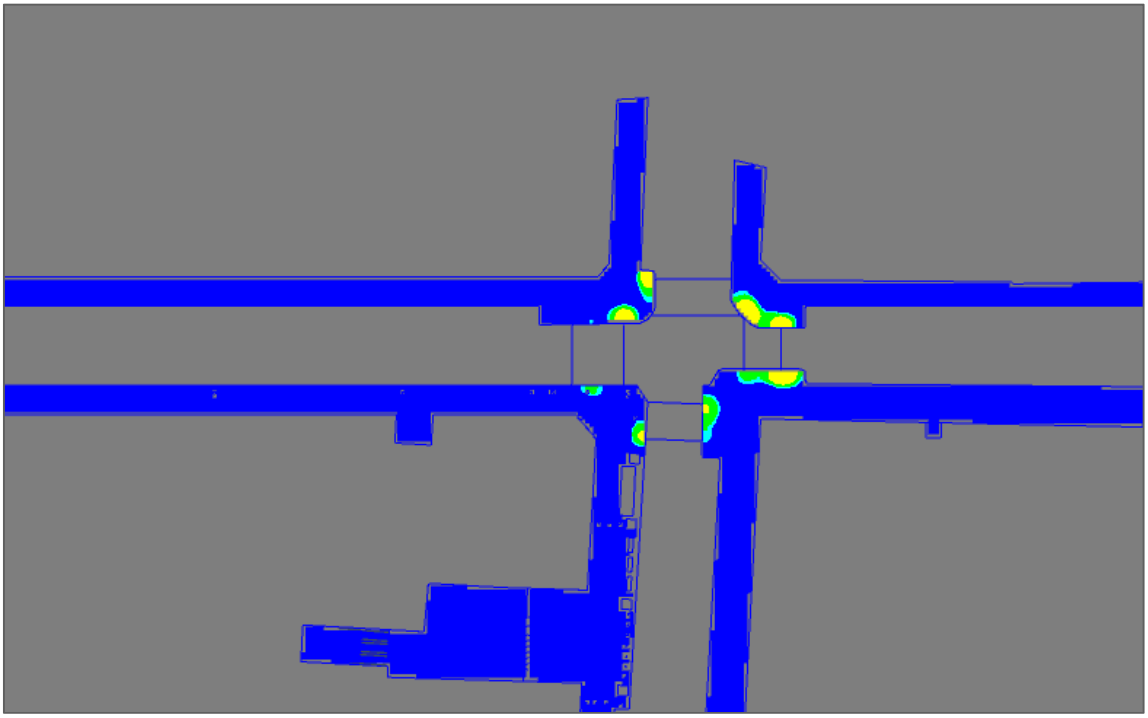


Figure 5-3: Pitt Street Precinct Area – Pitt St / Bathurst St Intersection Level of Service (2036 PM) - Fruin Queuing LoS Map

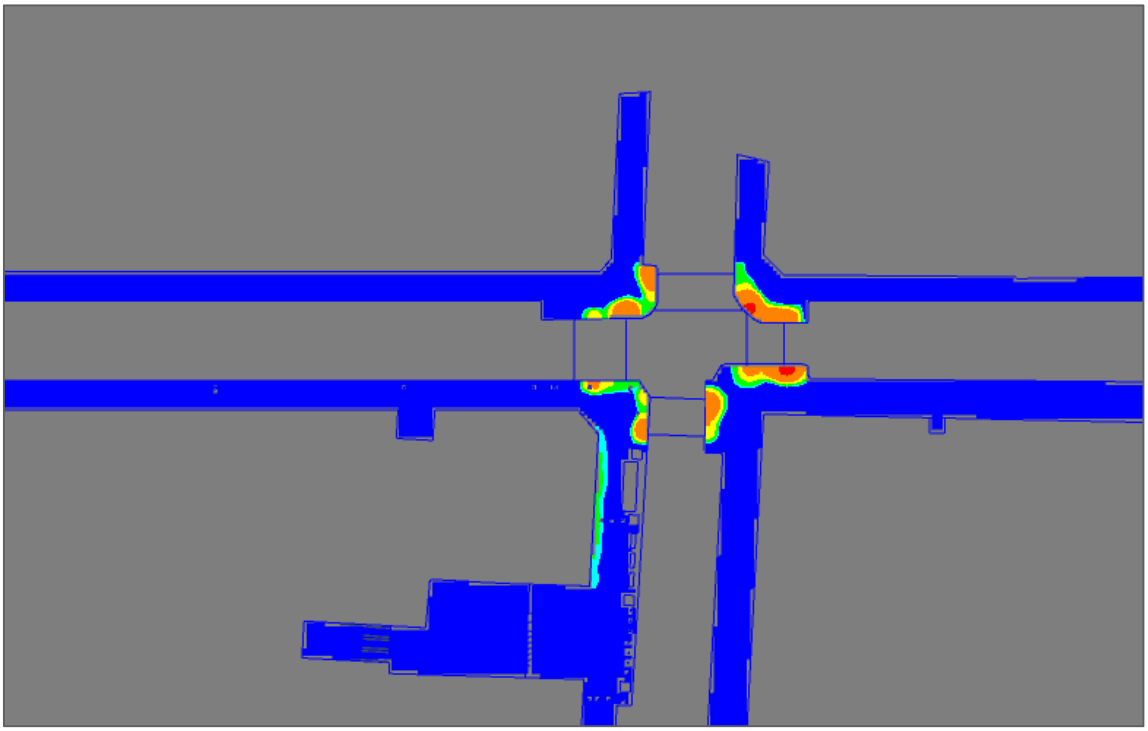


Figure 5-4: Pitt Street Precinct Area – Pitt St / Bathurst St Intersection Level of Service (2036 PM) - Fruin Walkways LoS Map

From the AM and PM peak queueing analysis, it identified that pedestrians experience up to Queueing LoS D and the highest level occurs at the Bathurst Street / Pitt Street and Pitt Street / Park Street intersections. The report has suggested that the high densities could be reduced by modifying the signal cycle times and optimising the signal phasing, or alternatively by widening the footpaths, noting that the Bathurst Street / Pitt Street intersection has been widened to 7.0m.

For the AM and PM peak walkway analysis, the footpaths along the corridors are observed to generally experience Walkways LoS A to LoS C. While at some isolated areas, the pedestrians experience drops to LoS D. Overall the pedestrian performance is considered satisfactory and the South OSD development

entries are not estimated to affect footpath operations in the immediate surrounds, or the Metro station operations.

5.4 Public Transport Assessment

As illustrated in Section 3.7, the South OSD site is currently highly accessible by public transport, and accessibility to public transport will be further increased with the new Pitt Street Metro Station underneath the development. Therefore, the development is considered to offer high levels of public transport accessibility and connectivity.

5.5 Cycling Assessment

The site is situated within the centre of Sydney CBD which presently has good cycling facilities, which will be further enhanced following construction of the planned cycling facilities, with the most notable of these the cycleway along Castlereagh Street. A Green Travel Plan has been prepared and documented as part of SMCSWSPS-AUR-OSS-PL-REP-000002 to encourage and ensure the residents and retail tenants are aware of the alternative transport options that are available within the vicinity of the site.

5.6 Car Share Assessment

As illustrated in Section 3.7.7, there are only five car share bays available within a comfortable walking distance (400m) from the site. In the wider network (>400m), there are more care share bays available, particularly on the east as shown in Figure 5-5. While tenants can walk to the car share bays that are within 800m, they can also utilise the convenient public transport options surrounding the site such as buses and trains, as an intermediate connection to the car share bays (i.e. walk-train-car share). Figure 5-5 has schematically shown the routes that are available for tenants to use as part of their journey to reach the most convenient car share sites. With Pitt Street Metro Station part of the new metro train line, the site will gain direct access to high frequency train services which will improve the car share coverage and journey time.

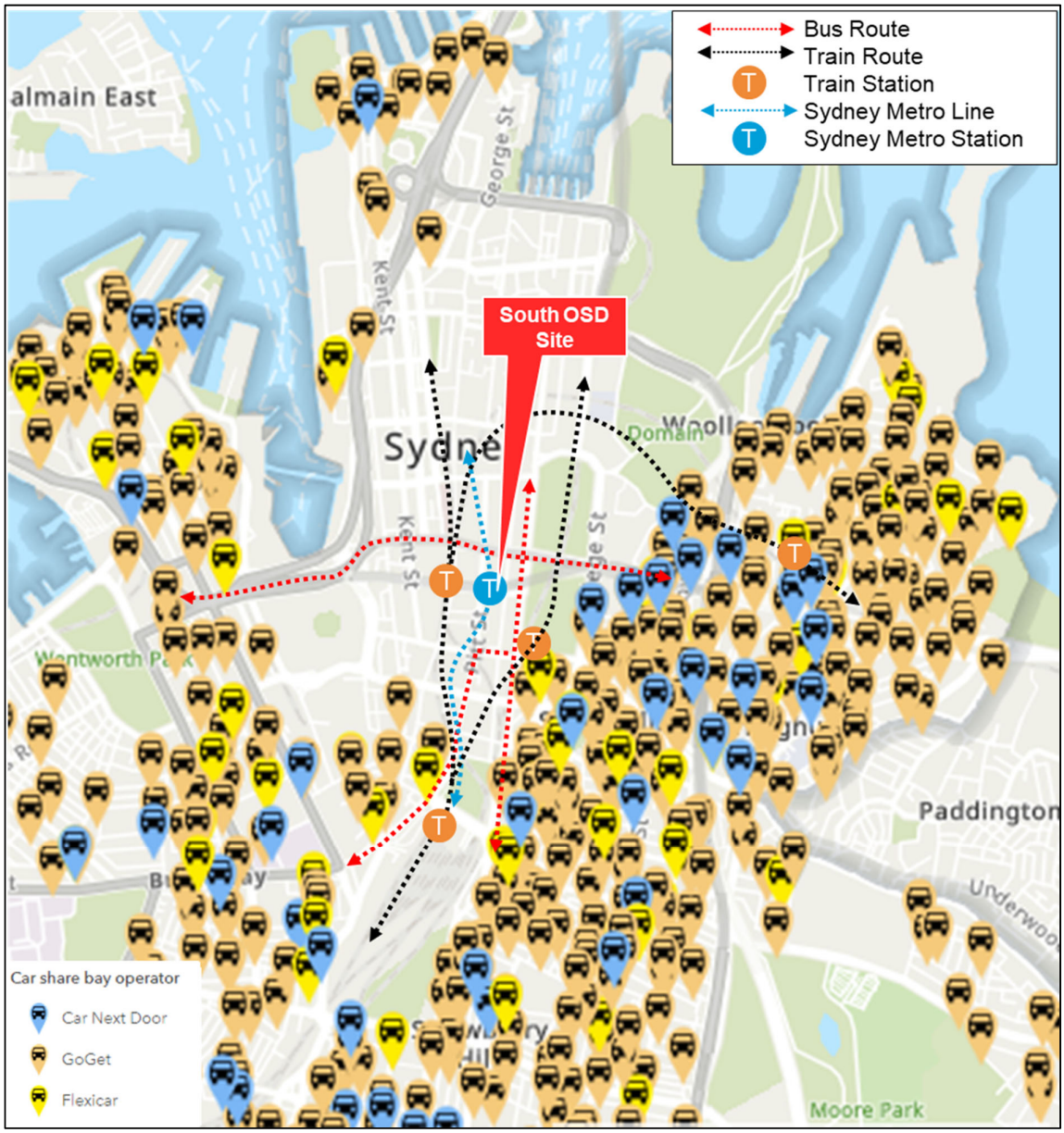


Figure 5-5: Car shares available within City of Sydney (source: City of Sydney Car Sharing Map)

5.7 Car Rental Assessment

The development will not provide any parking provision as the estimated tenant demographic will have a high demand for alternate transport, with private vehicle ownership estimated to be close to zero. However, the occasional private vehicle needs still should be accommodated by either car share (Section 5.6) or car rental, both of which are available within the vicinity as shown in Figure 5-6. For car share users, there are always dedicated bays available within the City of Sydney, whereas the car rental requires the driver to look for parking. As outlined in Section 3.4, there are numerous public on-street and off-street parking spaces available for drivers for either temporary or overnight parking. Therefore, the irregular and infrequent car driving demand can be met by the businesses and facilities in close proximity to the site.

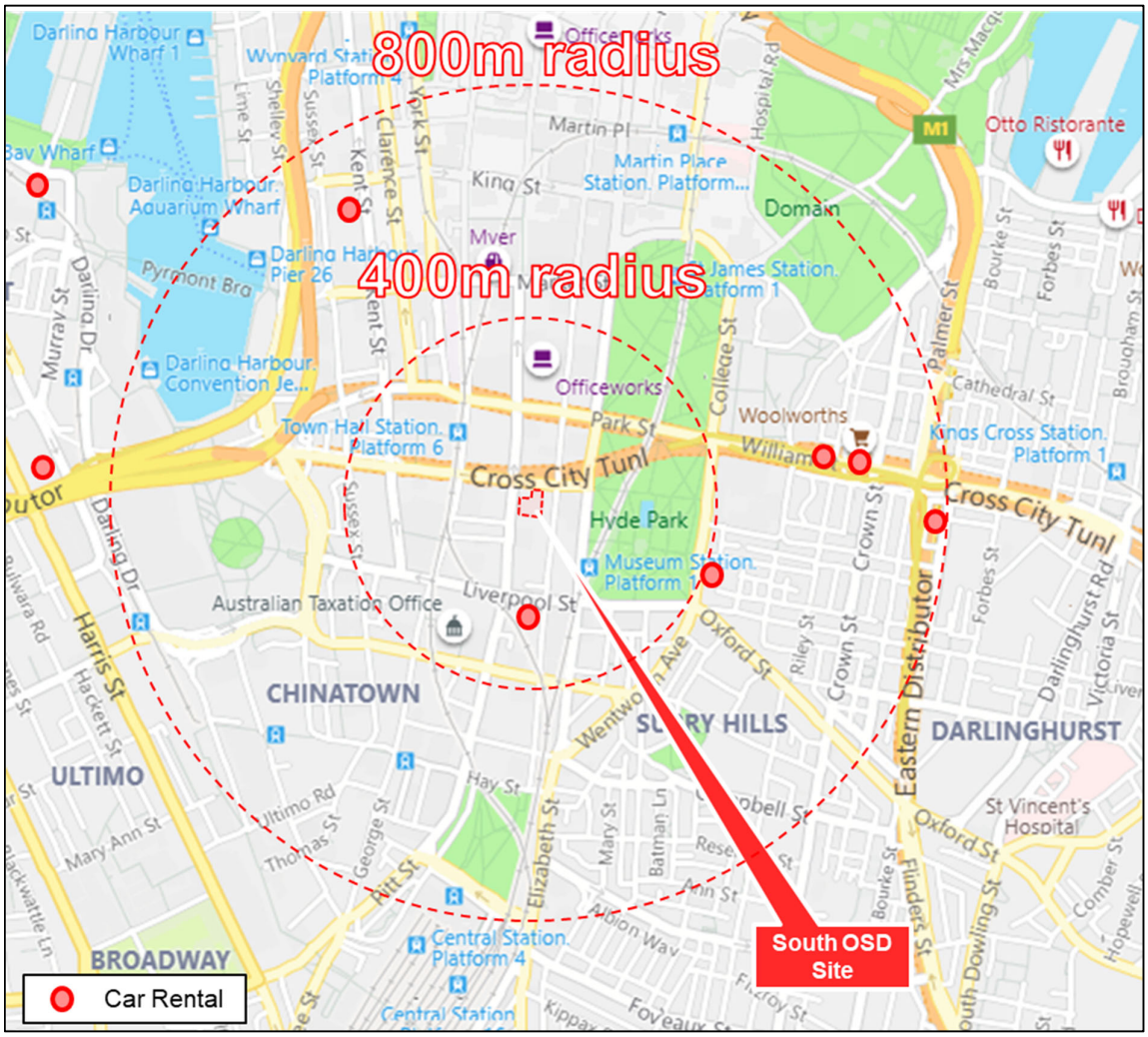


Figure 5-6: Car rental available within the vicinity of the site (basemap: Bing Map)

5.8 Taxi facilities and pick-up / drop-off operation

As described in Section 3.5, existing taxi ranks are available at the site's frontage; along both Bathurst Street and Pitt Street. These can be used to facilitate any pick-up and drop-off demand from the site. Rideshare services such as Uber and Ola can also be accessed from the site via the adjacent on-street public facilities on the adjacent corridors. As shown in Figure 5-8, there are parking spaces, loading zones and mail zones spaces available on all surrounding road corridors.

In addition to rideshare trips, food delivery services are also estimated to be generated by the residential development. The delivery services via car and motorcycle can utilise the on-street parking facilities, while courier cyclists will utilise the area in front of the main entry lobby for pick up and delivery (refer to Figure 5-7).

Private vehicle delivery is unlikely to be substantial in comparison with delivery services via cycling, given the road network within the Sydney CBD is extremely busy and most corridors have been enforced with low travel speed limits.

Therefore, with the available public parking and loading spaces available, the development is unlikely to result in any substantial impact on the surrounding road corridors such as queuing or substantial congestion.

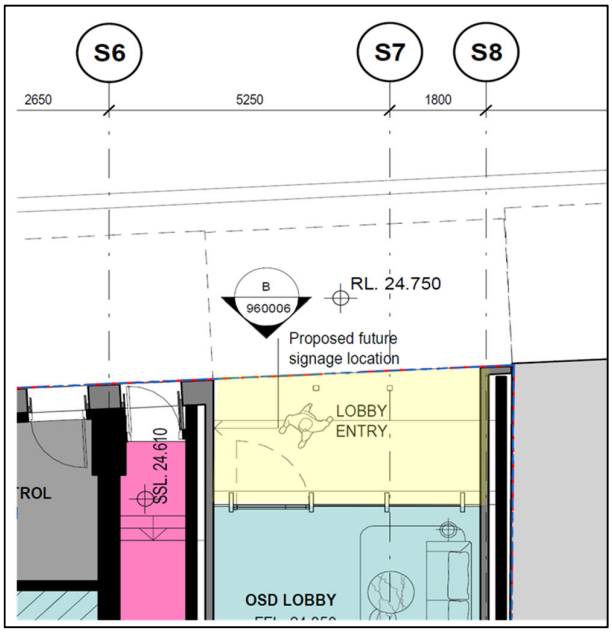


Figure 5-7: Pitt Street South cycle courier location (Reference: Bates Smart)

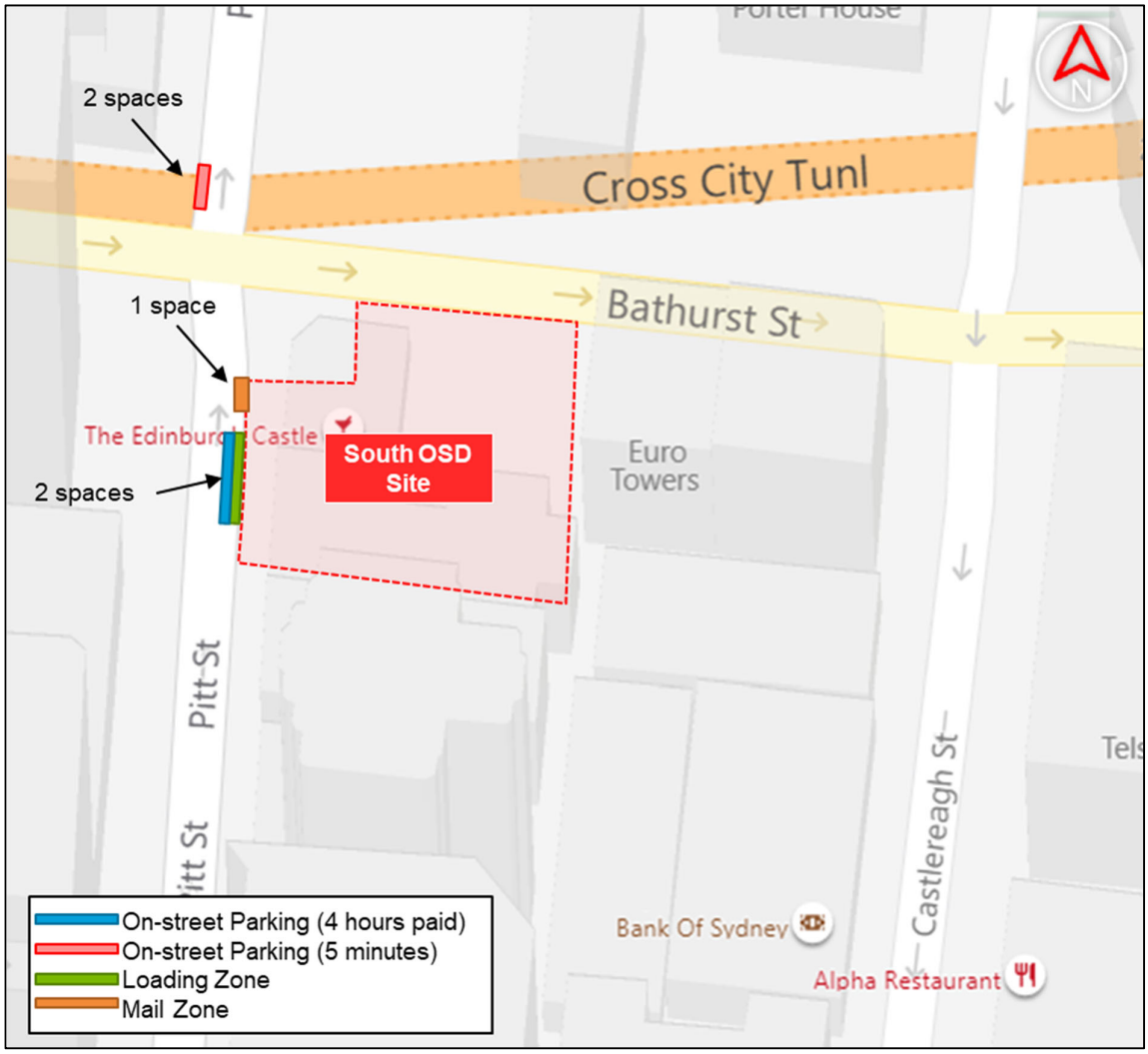


Figure 5-8: On-street public parking and loading facilities available at the site's frontage (basemap: Bing Map)

5.9 Safety Assessment

As discussed in Section 4.2, it is identified that the proposed vehicle access into the shared loading dock will potentially pose some safety risks to pedestrians and cyclists, particularly the on-street cyclists that might ride across the vehicle access crossover from Pitt Street to access the development. In order to minimise the risk, a warning system is proposed to be installed to alert the surrounding pedestrians and cyclists of incoming and outgoing commercial vehicles from the loading dock. In addition, convex mirrors can be installed within the building property boundary at the loading dock access to improve the drivers visibility of the footpath prior to exiting the access, and vice versa for the pedestrians to have better visibility of exiting vehicles.

Alternative safety measures have been explored including pivoting gates that stop pedestrians, alongside speed humps, and the preferred solution was convex mirrors and the use of flashing / audible lights.

For potential hostile vehicles, a detailed assessment has been undertaken separately to identify the potential risks and provided some measures to mitigate the risks. This can be found within the overall SSDA application.

6 Summary and Conclusion

The aim of this study was to assess the transport related impacts of the development; Pitt Street South OSD. The development comprises of 234 dwellings, 682m^2 of retail space, 203 tenant and visitor bicycle parking spaces, and four service bays in a dedicated loading dock area.

The following summarises the transport impacts of the development:

- **Public Transport:** The site is situated within the centre of Sydney CBD and is accessible (within 400m radius) to high frequency public transport services including buses and trains. With the Pitt Street Metro Station that will be directly beneath the site, it will significantly shorten the travel distance to public transport services for tenants and visitors, with an average service frequency of 3 minutes throughout the day. The recently opened Sydney CBD and South East Light Rail service has one of its stops (Town Hall) within 400m of the development. This will provide another public transport option for the development. Overall, the site is accessible to numerous public transport options and is estimated to be the primary travel mode for most tenants and visitors.
- **Cycling:** According to City of Sydney's Cycleway map, the site is adjacent to Pitt Street and Bathurst Street, that both are classified as "direct routes with higher traffic". These routes are considered to be the most direct route to access major land use in the CBD, and provide connection to other cycling infrastructure. There are numerous public bicycle parking spaces provided within the Sydney CBD, as well as in close proximity to the development. This is estimated to encourage the use of bicycles by tenants of the development for short trips within City of Sydney.
- **Bicycle Parking:** The South OSD will provide 203 bicycle parking spaces comprising of 135 dual bike and storage lockers, 44 vertical bike lockers and 12 visitor bike racks on level 3 and 12 bike storage facilities in the retail zone, which meets Greenstar requirements. Additionally, there will be 10 off-street bicycle spaces on the south of Bathurst Street, adjacent to the site, to be shared among the development and the public.
- **Pedestrians:** Assessment of the Pedestrian access to the South OSD Development has been undertaken as part of the Pitt Street Metro Development Application which formed part of the Critical State Significant Infrastructure (CSSI) submission. The dynamic pedestrian modelling integrated the metro station, the precinct and both the North and South OSD development. The report has concluded that the pedestrian level of service is generally satisfactory.
- **Private Vehicle Provision:** The development will not provide any parking provision for the tenants and visitors. The demand can be accommodated by the on-street parking spaces and a number of public car parks in the vicinity (within 400m), with approximately 3,700 parking spaces available for the site. It is identified that there are some public car parks that operate for 24 hours, providing approximately 1,400 parking spaces. However, for the occasional private vehicle requirements, tenants are able to utilise the businesses available within Sydney CBD such as car share and car rental services. These services are accessible via walking (for services within 400m of the site) and public transport (for services more than 400m from the site).
- **Traffic:** The development is estimated to generate approximately 16 – 24 vehicle trips during the road network peak periods. With this minimal number of trips, the development is unlikely to have any material impact on the adjacent road network.
- **Loading Dock Provision and Operation:** The South OSD development will provide four loading dock spaces and will be managed by a loading dock manager through a booking system. An assessment was undertaken to review the additional spaces to meet Sydney DCP 2012 and it was determined the proposed design provides for sufficient capacity to meet the maximum typical demand for the proposed land use of 8 vehicles during the peak hour. The development has also been designed to accommodate the estimated peak demand within the shared loading dock and not be reliant on, on-street parking as part of the day to day operations for the Station and OSD tenants. While there are existing loading zone spaces available on the surrounding road network in close proximity to the site, the need to use the existing on-street facilities is expected to be rare.

Appendix A: Service Delivery Plan

Pitt Street South OSD

Service Delivery Plan

(Appendix A)

Pitt Street Developer South Pty Ltd

Reference: 507262

Revision: C

24 August 2020

aurecon

Bringing ideas to life

Document control record

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Approval			
Author signature		Approver signature	
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Contents

1 Introduction

The purpose of this document is to provide context associated with the service delivery plan for South OSD as defined during the Pitt Street Over Station Development South Stage 2 Design process. The information provided in SMCSWSPS-AUR-OSs-PL-REP-000001 provides detailed information to the referenced information provided in this Service Delivery Plan.

1.1 The Site

The site is located within the Sydney CBD, on the corner of Bathurst Street and Pitt Street. It has two separate street frontages, Pitt Street to the west and Bathurst Street to the north. The area surrounding the site consists of predominantly residential high-density buildings and some commercial buildings, with finer grain and heritage buildings dispersed throughout.

The site has an approximate area of 1,710sqm and is now known as Lot 10 in DP 1255507. The street address is 125 Bathurst Street, Sydney as shown in Figure 1-1.

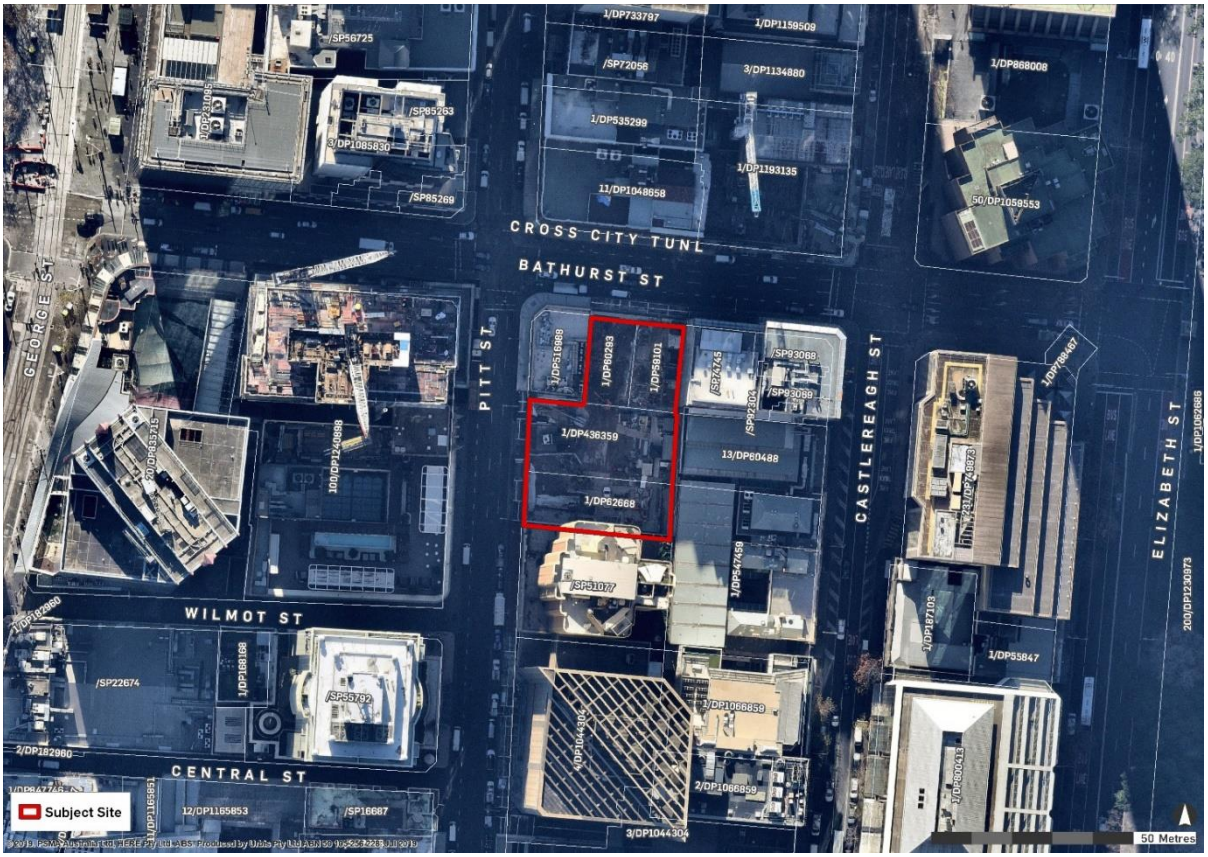

Figure 1-1: Location Plan (Reference: Urbis)

2 South OSD Vehicle Access

2.1 South OSD Vehicle Access Overview

The South OSD is proposed to have one right-in, right-out only vehicle access point, located on Pitt Street, as shown in Figure 2-1. This access will lead to the loading area and as such will be restricted to service and authorised vehicles only. Bike access will occur through the loading dock via a dedicated cycle access door.

The lobby entrance on Pitt Street will provide pedestrian access for South OSD residents and visitors, while retail area can be accessed from Bathurst Street, adjacent to the Pitt Street Metro Station access, as shown Figure 2-1.

Cyclists will access the residential development through the loading dock via a dedicated cycle access door on Pitt Street as indicated in Figure 2-1, sharing with the loading access.

As the pedestrian and cyclist access is proposed to be located close to the vehicle access to the south, the users are exposed to some safety risks, particularly the on-street cyclists who travel in a northbound direction will ride across the vehicle access crossover from Pitt Street to access the development. Hence, it is suggested some awareness improvements be implemented in the area to minimise the risk, such as a warning system and convex mirror as shown in Figure 3-7.

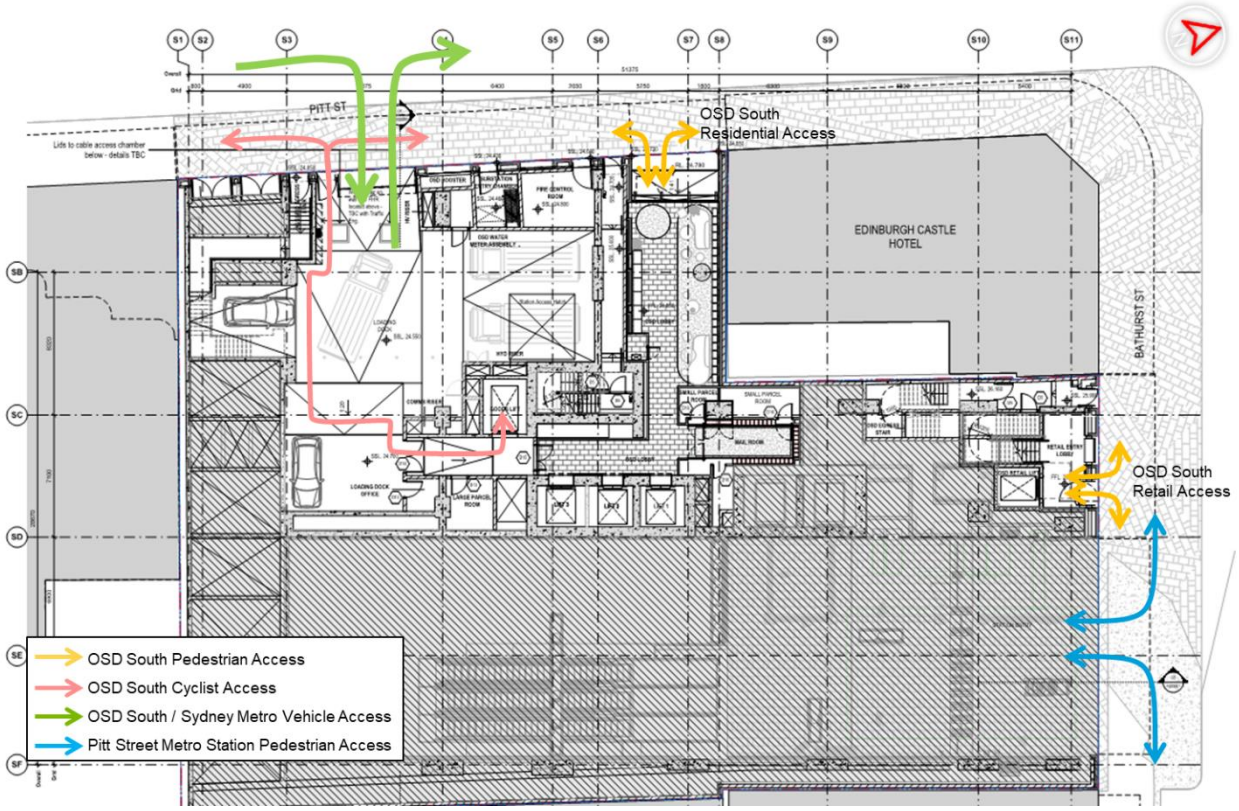

Figure 2-1: South OSD access locations on the ground floor (drawing no: SMCSWSPS-BAT-PSS-AT-DWG-910041)

2.2 Loading Dock and Service Vehicles

With reference to Figure 2-2, the South OSD loading dock will provide a total of four on-site service vehicle bays with the bays designed to mainly accommodate the vehicle types below:

- 2 x Small Rigid Vehicle (SRV); and
- 2 x light commercial vehicles (B99, 99th percentile of class of cars). One of these bays is a dedicated Sydney Metro bay.

Figure 2-2: South OSD Loading Dock (reference: Bates Smart)

The loading dock is estimated to be receive the following services via those bays, but not limited to:

- Grocery deliveries (regularly);
- Goods deliveries for retail (weekly);
- Furniture delivery (prior to opening and rarely occur after opening);
- Waste collection (daily);
- Cleaning and maintenance service (regularly);
- Building maintenance service (occasionally);
- Mail and parcel delivery (irregular and non-manageable); and
- Metro transformer replacement service (emergency).

2.3 Metro Loading

The Metro Operation bay (see Figure 2-3) will be occasionally occupied to undertake maintenance services for the Pitt Street Station. For the service occasion that requires major possession, for example a transformer replacement, the possession will be undertaken outside of peak periods and on street level due to the limited height space within the loading dock. This limited height is due to the combined height of a MRV / SRV truck and the station transformer. However, such services are extremely rare, and the operation will be well planned for prior to service to ensure the impact on the surrounding can be kept at minimal.

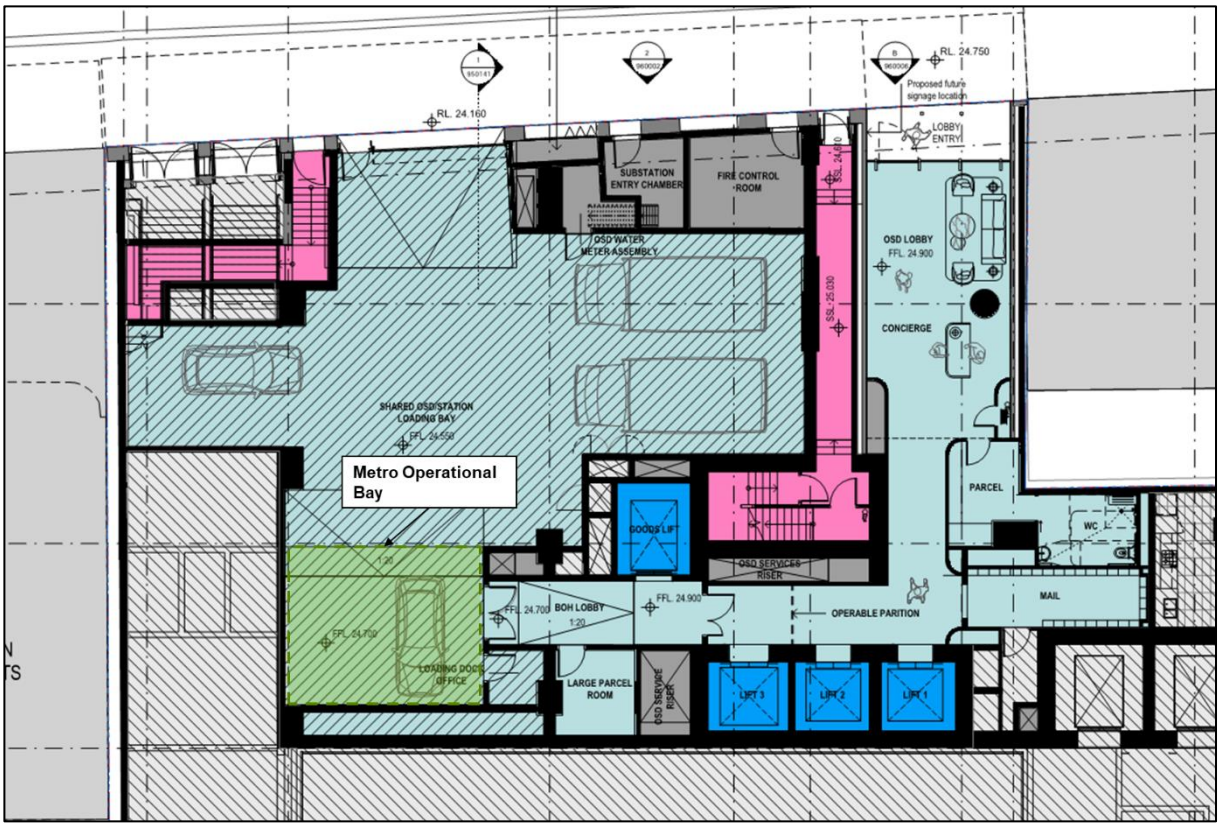

Figure 2-3: Metro operational bay at loading dock area

2.4 Waste Management

For waste management requirements, refer to the Waste Management Plan in SMCSWSPS-TTM-OSS-PL-REP-000001.

2.5 Furniture Trucks

Furniture trucks are likely to be used by residents to move in and out of the residential apartments. As part of the ‘move in’ and ‘move out’ packs, residents need to be advised the furniture truck size limitation to a vehicle no greater than 6.4m (SRV vehicle).

3 Loading Dock Management

The Delivery Service Plan will be managed by a dedicated on-site loading dock master through an integrated loading dock digital system, notifying when deliveries are arriving and the time allocations for each specific loading requirement. To assist with the development of the Delivery Service Plan, a high-level assessment has been undertaken for the loading dock.

The South OSD loading dock is used by two customer types: the residents and the retail tenants. For both user groups, access to the loading dock will need to be booked in advanced via a dedicated booking system. For this, the following governing principles are recommended to be incorporated as part of the loading dock Delivery Service Plan:

- Prioritise the arrival of residential tenants during dedicated time periods, such as over weekends when residents are likely to be moving in and out of the apartments. This time period to be determined by the loading dock manager.
- Outside of the dedicated time periods allocated to residential tenants, the loading dock will be prioritised for general loading for retail and waste management activities.
- Waste management will need to be prioritised such that both SRV loading bays are available for the waste collection vehicle for the nominated time period as provided in the Waste Management report and further consulted with the City of Sydney upon operation.

To understand the maximum capacity of the loading dock, it is assumed that each individual vehicle requires approximately 5 minutes to undertake the action of parking in the nominated parking bay and has then been allocated 25 minutes for loading requirements. As there are three dedicated parking bays for all South OSD loading usage (two SRV and one B99 bay), this equates to a maximum of 6 vehicles accessing the loading dock per hour (which includes parking time). Based on studies undertaken of similar sized loading docks (refer to main South OSD Traffic and Transport Accessibility Report SMCSWSPS-AUR-OSS-PL-REP-000002), the peak loading time is generally in the morning between 8:00am and 11:00am and again between 2:00pm and 4:00pm, with an average dwell time of 24 minutes. As such, during this 5-hour time period a total of 30 loading vehicles (excluding waste) may undertake loading activities.

If loading is required for a longer period for a particular bay, it is suggested that this is scheduled in for periods of the day when the regular demand to use the loading dock is reduced and additional time may be more easily accommodated.

Increasing the loading dock operating hours allows for additional vehicles to access the loading dock, which may be required to manage peak periods of operation or during times where bays are potentially unavailable due to Metro loading requirements.

A combination of various time allocations for loading vehicles may be possible such that a different time allocation is provided for the two SRV bays compared to the single B99 bay.

3.1 Booking System

A digital booking system will be implemented to manage loading dock operations. This section to be updated by the loading dock manager once the formal loading dock booking system is known.

3.2 Swept Path Analysis

A swept path analysis was undertaken for a 5.2m length B99 vehicle and a 6.4m length SRV. As advised by the waste management plan (refer to document SMCSWSPS-TTM-OSS-PL-REP-000001), 2.0m clearance should be provided from the northern wall to the SRV loading bays, and the swept paths should be undertaken in reverse-in and forward-out movements. While for SRV undertaking forward-in and reverse-out movements, it has been advised that the service vehicles will occupy two bays within the loading area. Therefore, the vehicle will not be restricted by the dedicated parking lines. It has also been advised that the access will be restricted while waste collection is being undertaken on the site. This will be managed by the loading manager and incorporated in the Delivery Service Plan.

Figure 3-1 to Figure 3-4 illustrate that the design layout can adequately accommodate the designed vehicle movement to service the loading dock. However, the SRV accessing the western loading bay, will be required to undertake a three point turn upon exit. This is considered acceptable as there is sufficient visibility and the movement is achievable. The swept paths show that the vehicles do not require more than three points turn to manoeuvre in and out from the bays. It should be noted that the Pitt Street Metro Station vehicle (B99) is able to reverse into the allocate parking area when the loading bays are vacant.

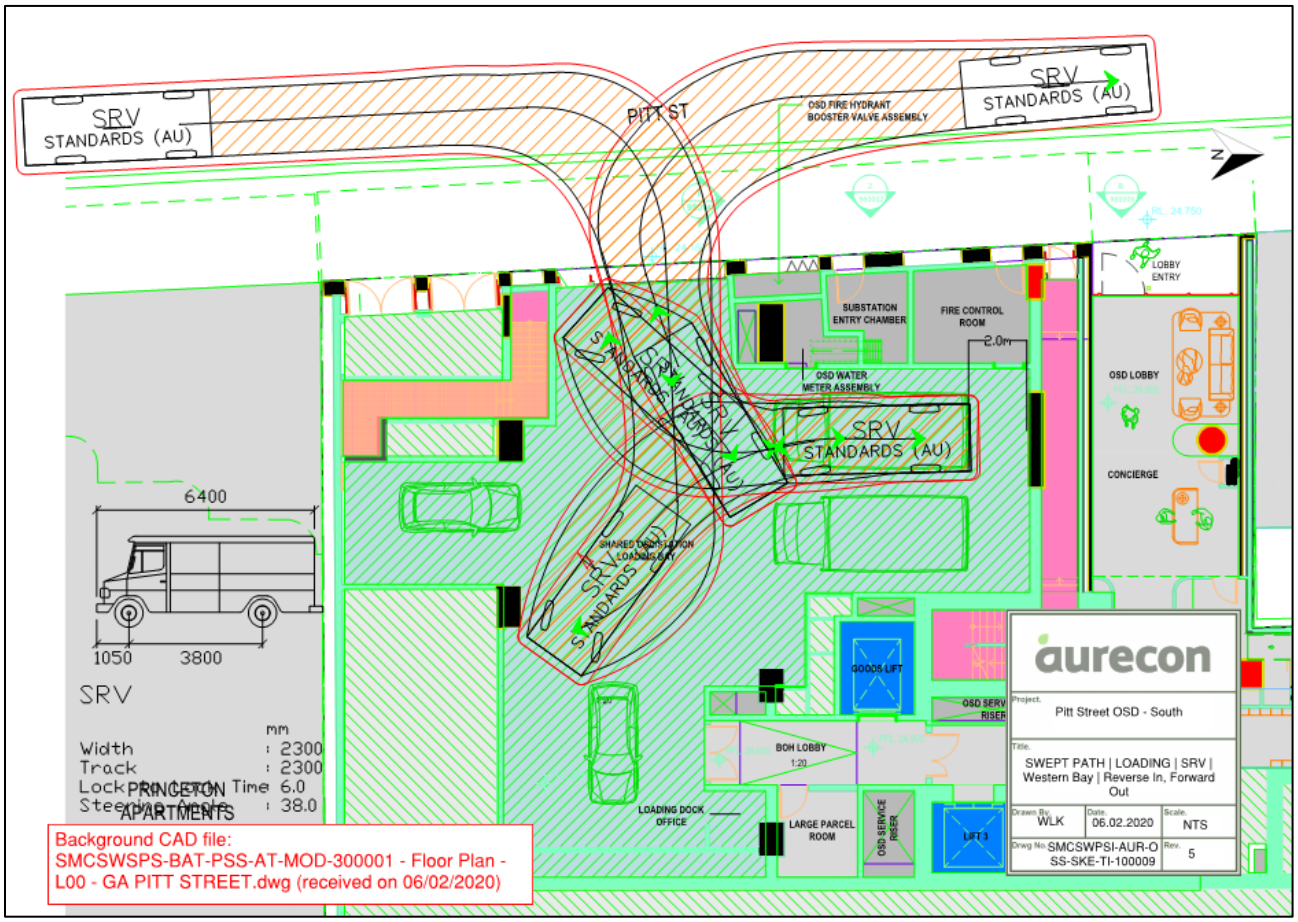

Figure 3-1: Vehicle swept path analysis for the SRV western bay – reverse in and forward out from bay

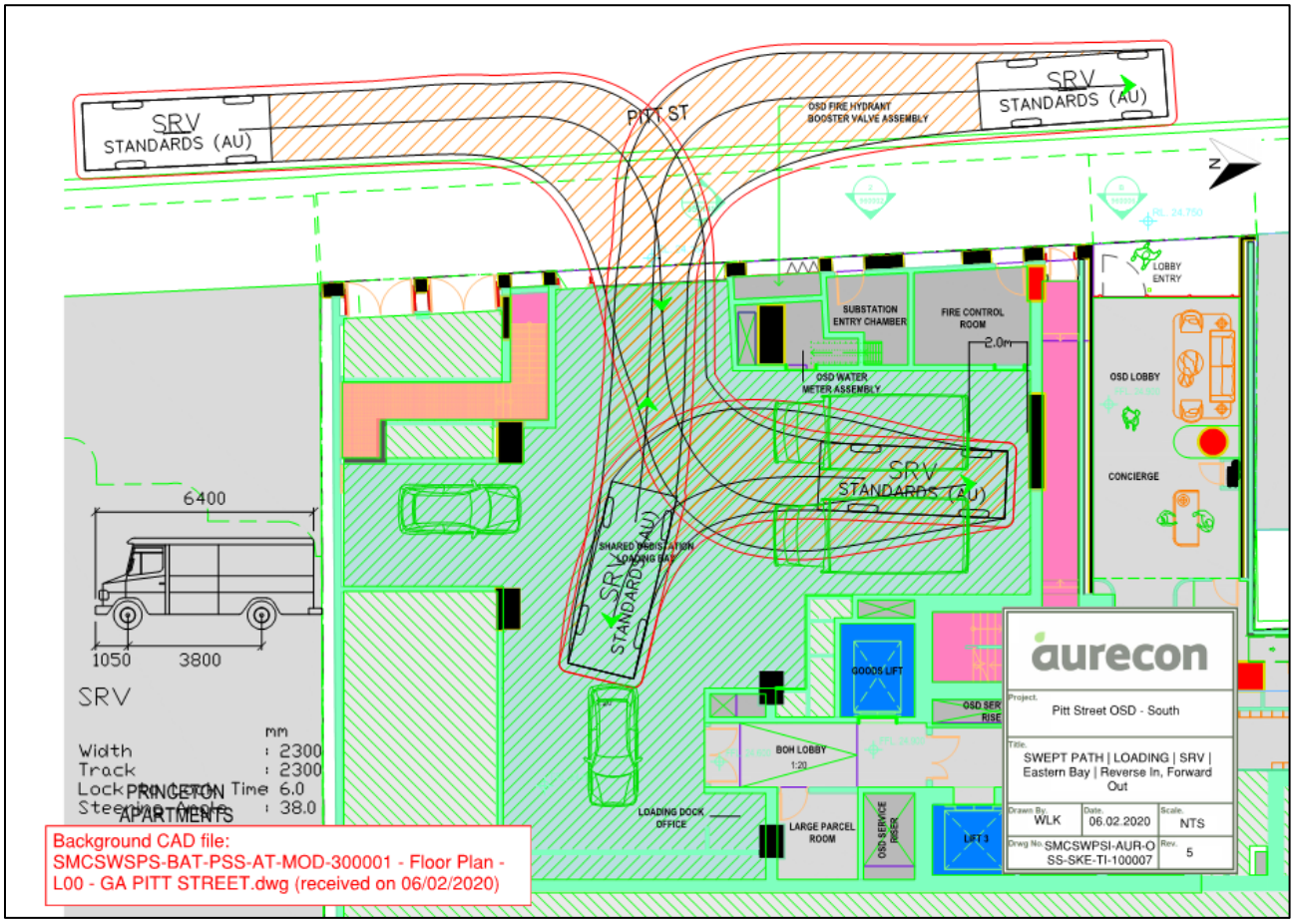

Figure 3-2: Vehicle swept path analysis for the SRV eastern bay – reverse in and forward out from bay

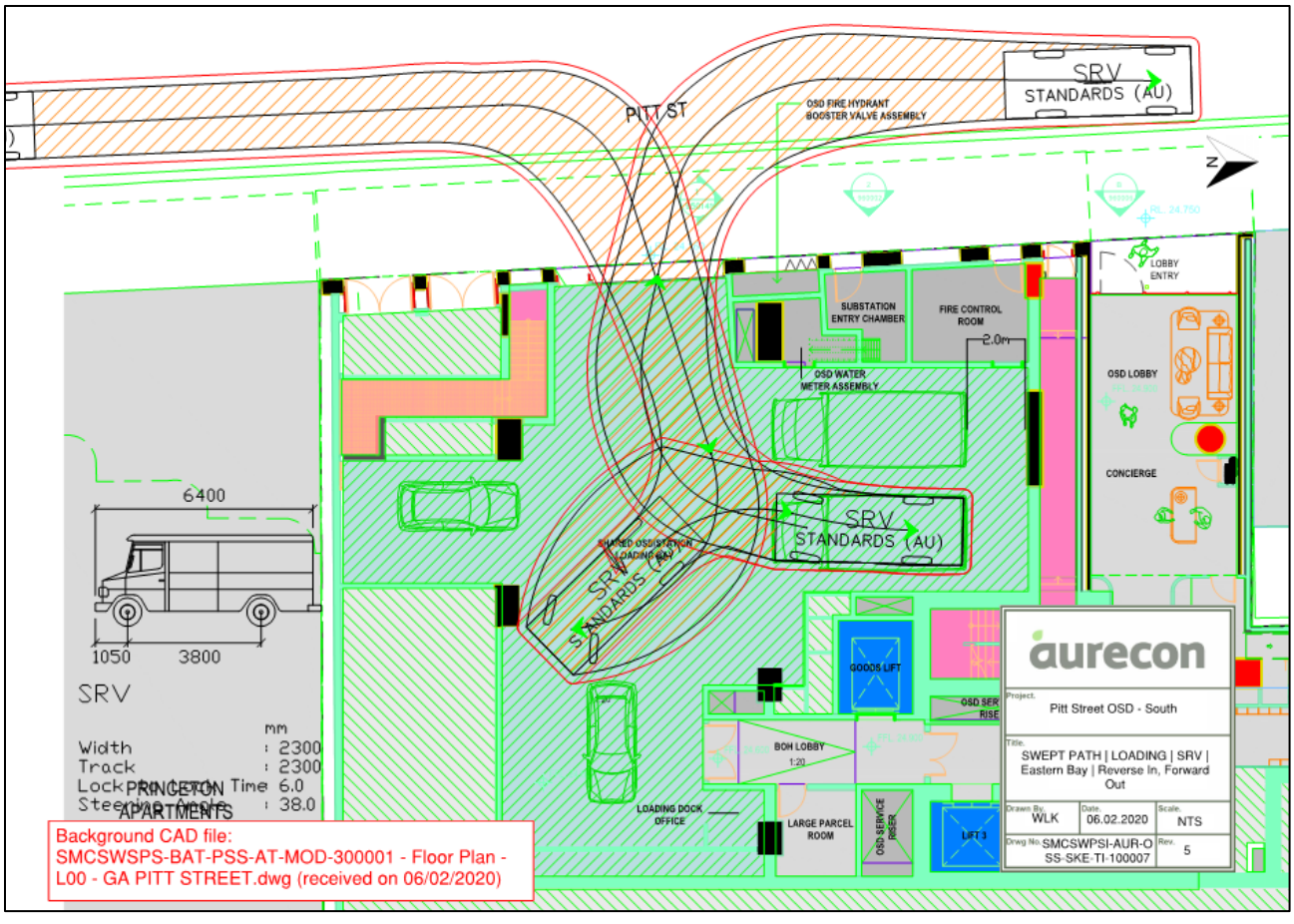

Figure 3-3: Vehicle swept path analysis for the SRV – forward in and reverse out from loading area

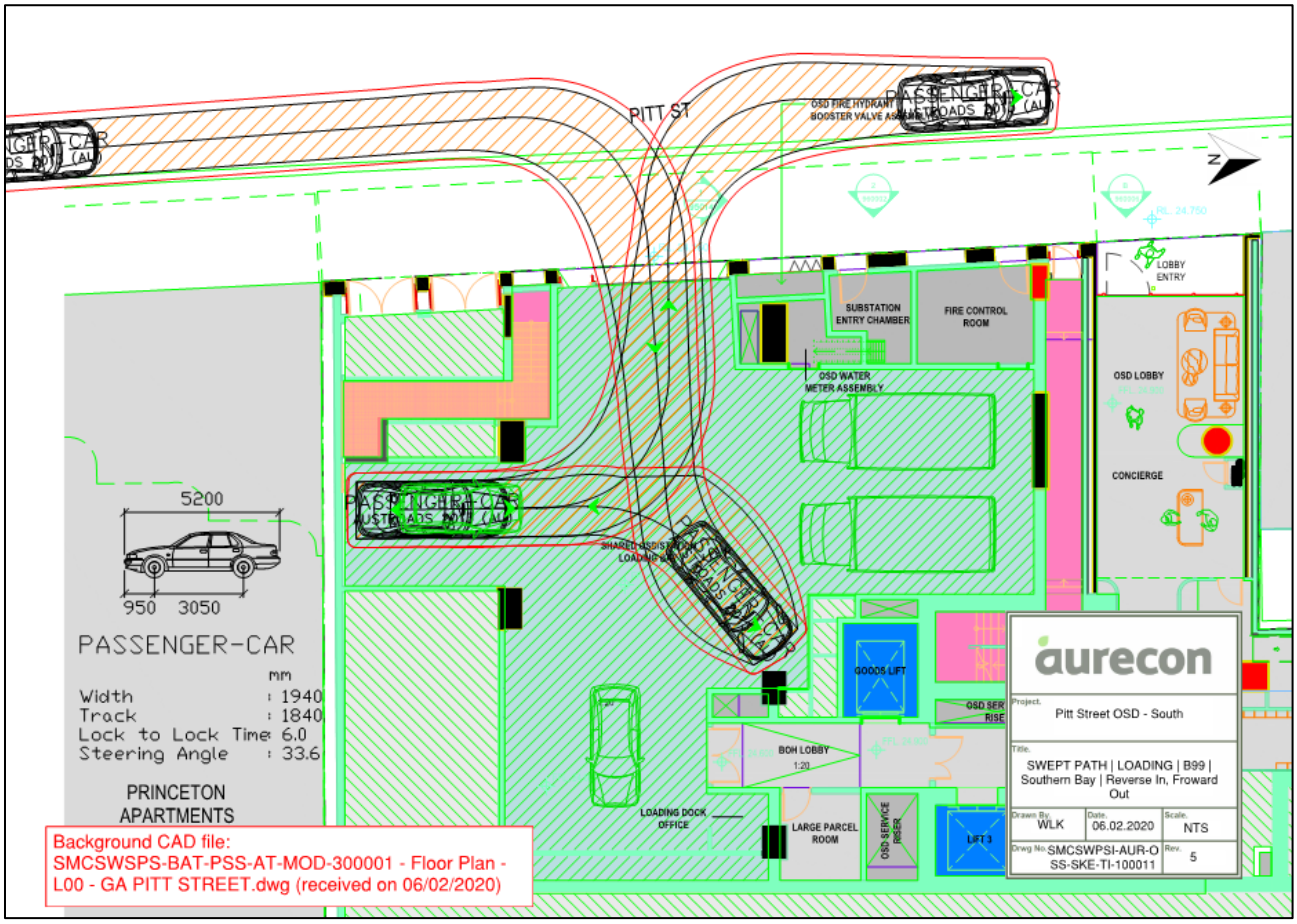

Figure 3-4: Vehicle swept path analysis for the B99 southern service bay – forward in and reverse out from bay

Vertical Clearance for Vehicle Access

Figure 3-5 shows a vertical swept path associated with an SRV sized vehicle accessing the loading dock. The maximum length of an SRV vehicle is 6.4m and height is 3.3m. Clearance into the loading dock is limited to 3.5m meeting the minimum AS 2890.2 requirements.

As recommended in AS2890.1:2004 – Parking Facilities Part 1: Off-street car parking, a minimum of 2.2m height between floor and any overhead obstruction is required for standard passenger vehicles and light vans. The stair adjacent to the B99 southern service bay has a headroom of approximately 2.6m height as shown in Figure 3-6 , which is the limiting headroom within the loading bay area. Therefore, the design is considered to provide sufficient headroom clearance.

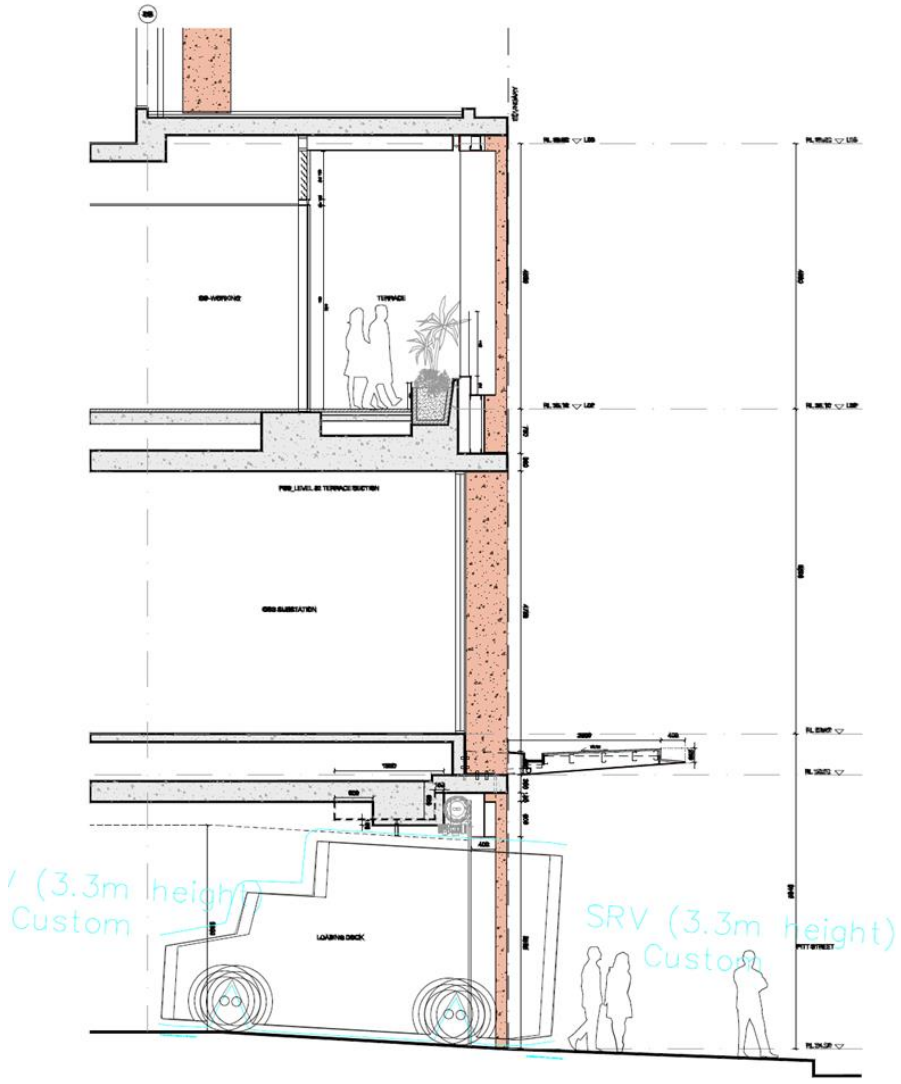

Figure 3-5: Pitt Street South Vertical Swept Path into the loading dock

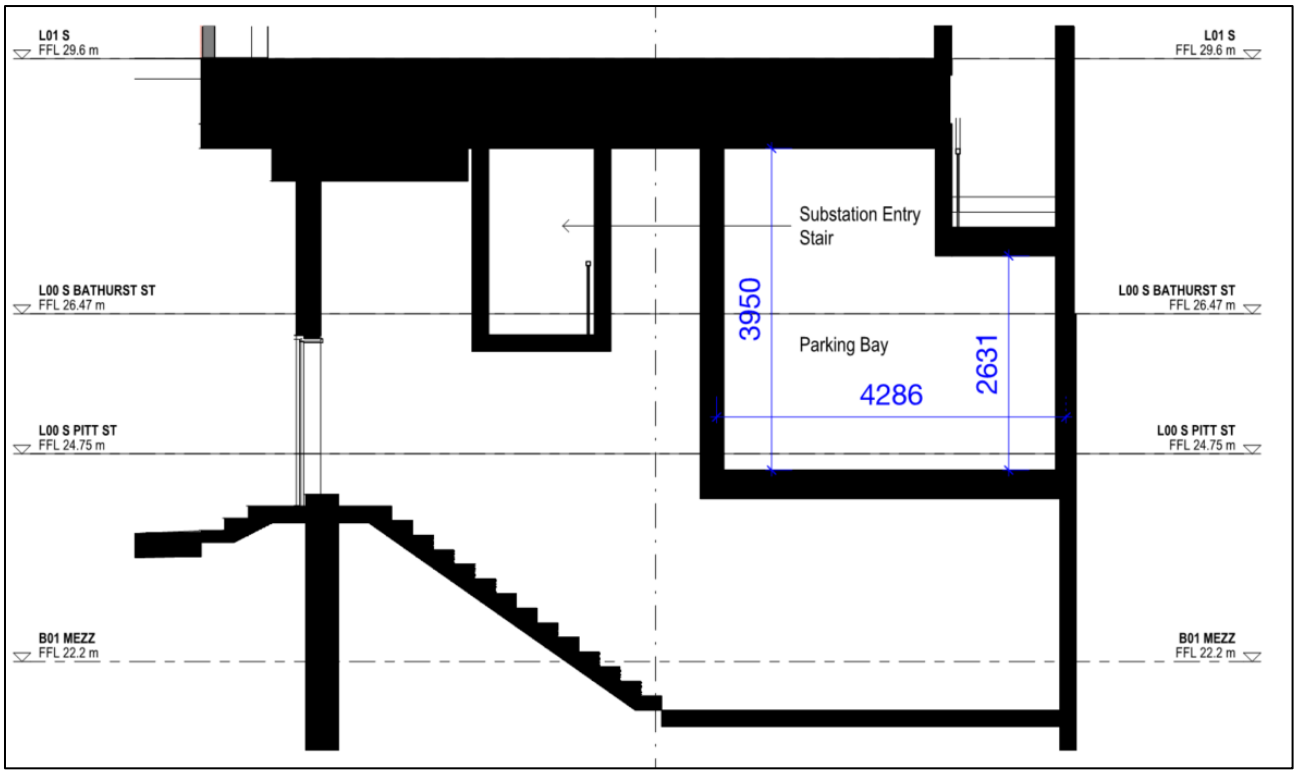

Figure 3-6: Cross section A elevation view between level B01 Mezz and level L01

3.3 Safety Considerations

It is identified that the loading dock vehicle access will potentially pose some safety risks to pedestrians and cyclists, particularly the on-street cyclists that might ride across the vehicle access crossover from Pitt Street to access the development. In order to minimise the risk, a warning system is proposed to be installed to alert the surrounding pedestrians and cyclists of incoming and outgoing commercial vehicles from the loading dock. In addition, convex mirrors can be installed within the building property boundary at the loading dock access to improve the drivers visibility of the footpath prior to exiting the access, and vice versa for the pedestrians to have better visibility of exiting vehicles.

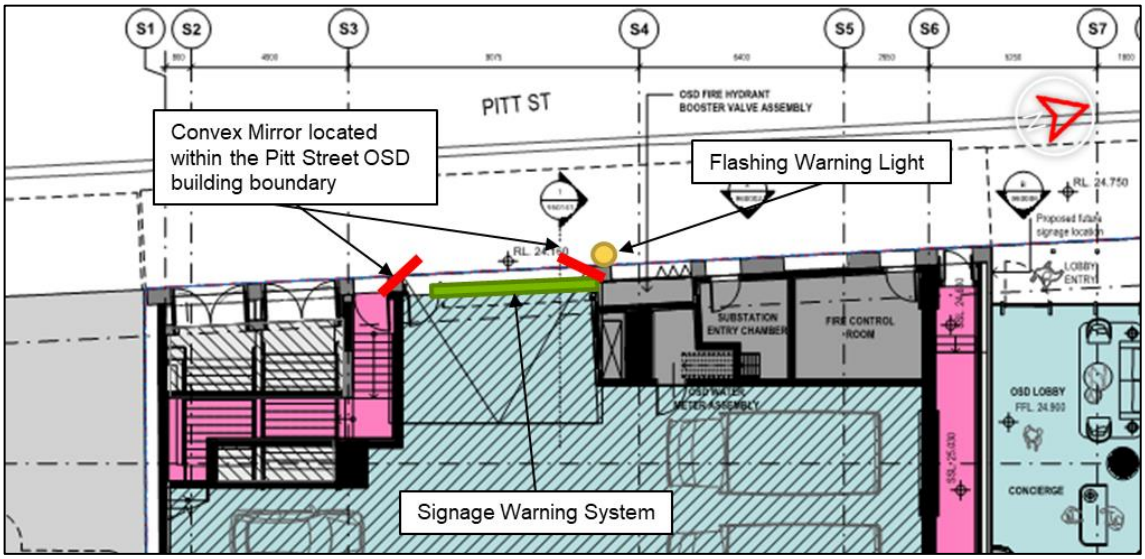

Figure 3-7: Suggested safety\measures at loading dock access (reference: SMCSWSPS-BAT-OSS-AT-DWG-930041 Rev: C)

4 Contingency Response to Potential Incidents

A number of potential incidents may limit the operation of the loading dock. These are shown in Table 4-1.

Table 4-1: Contingency Responses for Potential Incidents at South OSD

Incident	Impact	Response
Blocked Access to the Loading Dock	A vehicle has broken down within the loading facility limiting access to the loading dock, including a specific bay.	If the vehicle is broken down in a particular bay, then all vehicles scheduled to use that particular bay will need to be notified immediately. Towing of the vehicle may be required.
Blocked Access to Loading Dock	Loading Dock not available.	Towing Service to be called immediately to remove the vehicle. Any scheduled deliveries will need to be rescheduled to following when the broken-down vehicle is removed.
Delivery outside of nominated booking time	Vehicle blocking access to the loading dock.	If a bay is available, dock master to allow vehicle to undertake required loading in available bay. If a bay is not available, vehicle to schedule in time when bay is available.
Loading taking longer than time limit	Arrival and delay of consecutive vehicles arriving to the loading dock.	If time is available, the bay may be utilised for the extra time required. If it is impacting the operations of other vehicles, then the loading dock master is to decide if this vehicle is to vacate the bay, or notify the next vehicle to come at a different time slot.

Furthermore, a contingency parking shortfall can be accommodated by the loading zones available on the adjacent road corridors as shown in Figure 4-1.

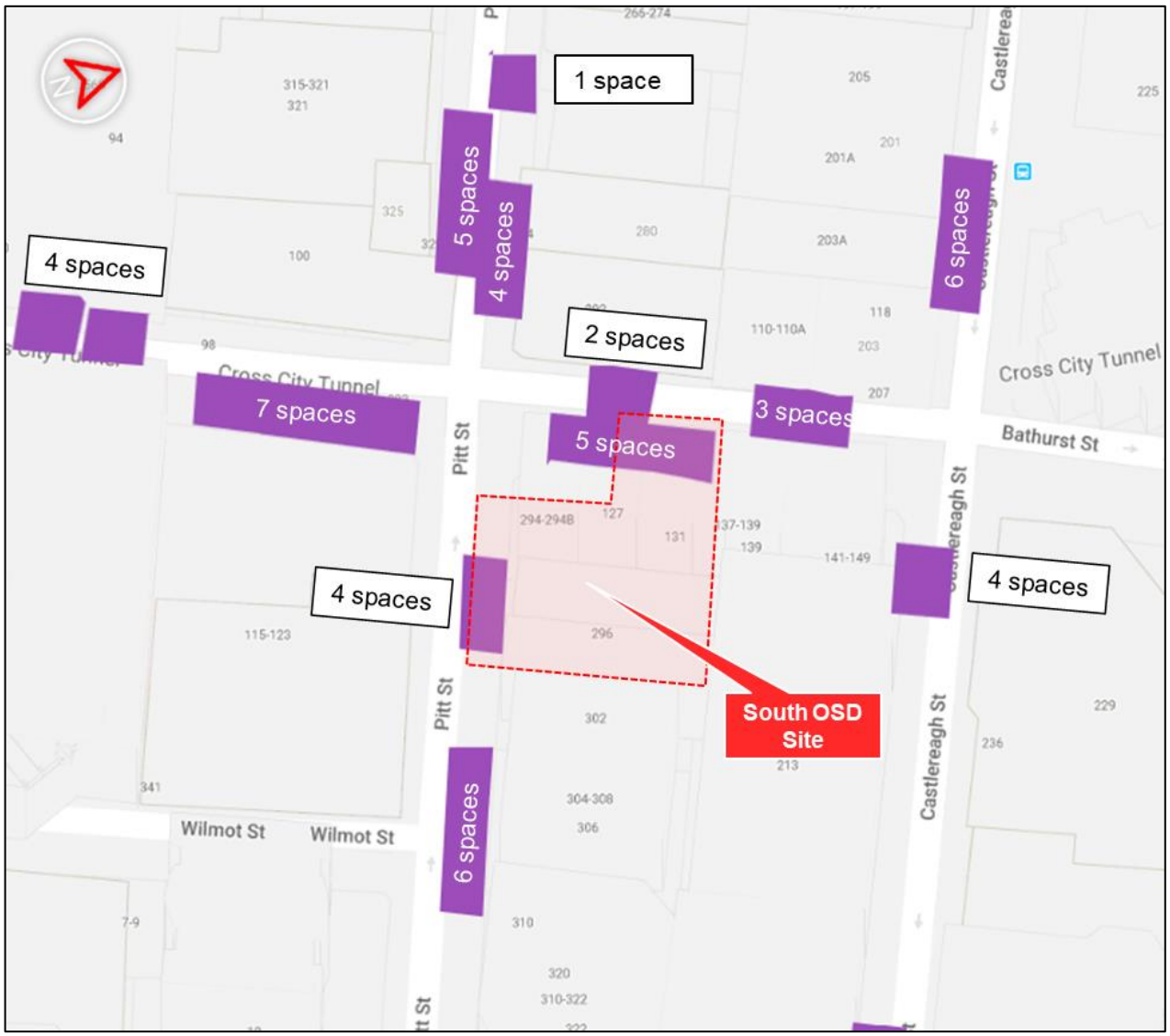

Figure 4-1: Nearby loading zones to South OSD (Source: TfNSW Tomorrow's Sydney Interactive Map, updated on 30/08/2018)

5 Next Steps

As the building becomes operational, the Delivery Service Plan will be updated accordingly to reflect any changes within the site, in particular as the commercial and retail tenants become known. This Service Deliver Plan is recommended to be updated once the Loading Dock master is appointed for South OSD.

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