

# **TRANSPORT AND TRAFFIC IMPACT ASSESSMENT REPORT**

APPENDIX T





# Sydney Metro City & Southwest Pitt Street North Over Station Development

## Transport and Traffic Impact Assessment Report

<b>Applicable to:</b>	Sydney Metro City & Southwest
<b>Author:</b>	The Transport Planning Partnership Pty Ltd
<b>Owner</b>	Sydney Metro
<b>Status:</b>	Final
<b>Version:</b>	# 5
<b>Date of issue:</b>	August 2018
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# 1. Purpose of this report

## 1.1. Background

This report supports a concept State Significant Development application (concept SSD Application) submitted to the Department of Planning and Environment (DPE) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The concept SSD Application is made under section 4.22 of the EP&A Act.

Sydney Metro is seeking to secure concept approval for a mixed use tower above the northern portal of Pitt Street Station, otherwise known as the over station development (OSD). The concept SSD Application seeks consent for a building envelope and its use for residential accommodation, visitor accommodation and commercial premises, maximum gross floor area (GFA), pedestrian and vehicular access, circulation arrangements and associated car parking as well as the strategies and design parameters for the future detailed design of development.

Sydney Metro proposes to construct the OSD as part of an integrated station development package, which would result in the combined delivery of the station, OSD and public domain improvements. The station and public domain elements form part of a separate planning approval for Critical State Significant Infrastructure (CSSI) approved by the Minister for Planning on 9 January 2017.

As the development is within a rail corridor, is associated with railway infrastructure and is for the purposes of residential or commercial premises with a Capital Investment Value of more than \$30 million, the project is State Significant Development (SSD) pursuant to Schedule 1, clause 19(2)(a) of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). The full extent of the proposed development is also State Significant Development by virtue of clause 8(2) of the SRD SEPP.

This report has been prepared to respond to the Secretary's Environmental Assessment Requirements (SEARs) issued for the concept SSD Application for Pitt Street North on 30<sup>th</sup> November 2017 which state that the Environmental Impact Statement (EIS) is to address the following requirement:

*Transport, Traffic, Parking, and Access*

## 1.2. Overview of the Sydney Metro in its context

The New South Wales (NSW) Government is implementing *Sydney's Rail Future*, a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future (Transport for NSW, 2012). Sydney Metro is a new standalone rail network identified in *Sydney's Rail Future*.

Sydney Metro is Australia's biggest public transport project, consisting of Sydney Metro Northwest, which is scheduled for completion in 2019 and Sydney Metro City & Southwest, which is scheduled for completion in 2024.

Sydney Metro West is expected to be operational in the late 2020s. (Refer to **Figure 1**).



**Figure 1:** Sydney Metro alignment map

Sydney Metro City & Southwest includes the construction and operation of a new metro rail line from Chatswood, under Sydney Harbour through Sydney’s CBD to Sydenham and on to Bankstown through the conversion of the existing line to metro standards.

The project also involves the delivery of seven new metro stations, including at Pitt Street. Once completed, Sydney Metro will have the ultimate capacity for 30 trains an hour (one every two minutes) through the CBD in each direction - a level of service never seen before in Sydney.

On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham application as a Critical State Significant Infrastructure project (reference SSI 15\_7400), hereafter referred to as the CSSI Approval.

The CSSI Approval includes all physical work required to construct the CSSI, including the demolition of existing buildings and structures on each site. Importantly, the CSSI Approval also includes provision for the construction of below and above-ground structures and other components of the future ISD (including building infrastructure and space for future lift cores, plant rooms, access, parking and building services, as relevant to each site). The rationale for this delivery approach, as identified within the CSSI Application, is to enable the ISD to be more efficiently built and appropriately integrated into the metro station structure.

The EIS for the Chatswood to Sydenham component of the Sydney Metro City & Southwest project identified that the OSD would be subject to a separate assessment process.

Since the CSSI Approval was issued, Sydney Metro has lodged four modification applications to amend the CSSI Approval as outlined below:

- Modification 1- Victoria Cross and Artarmon Substation which involves relocation of the Victoria Cross northern services building from 194-196A Miller Street to 50 McLaren Street together with inclusion of a new station entrance at this location referred to as Victoria Cross North. 52 McLaren Street would also be used to support construction of these works. The modification also involves the relocation of the substation at Artarmon from Butchers Lane to 98 – 104 Reserve Road. This modification application was approved on 18 October 2017.
- Modification 2- Central Walk which involves additional works at Central Railway Station including construction of a new eastern concourse, a new eastern entry, and upgrades to suburban platforms. This modification application was approved on 21 December 2017.
- Modification 3 - Martin Place Station which involves changes to the Sydney Metro Martin Place Station to align with the Unsolicited Proposal by Macquarie Group Limited (Macquarie) for the development of the station precinct. The proposed modification involves a larger reconfigured station layout, provision of a new unpaid concourse link and retention of the existing MLC pedestrian link and works to connect into the Sydney Metro Martin Place Station. It is noted that if the Macquarie proposal does not proceed, the modification (if approved) would be surrendered. This modification application was approved on 22 March 2018.
- Modification 4 - Sydenham Station and Sydney Metro Trains Facility South which incorporated Sydenham Station and precinct works, the Sydney Metro Trains Facility South, works to Sydney Water's Sydenham Pit and Drainage Pumping Station and ancillary infrastructure and track and signalling works into the approved project. This modification application was approved on 13 December 2017. Given the modifications, the CSSI Approval is now approved to operate to Sydenham Station and also includes the upgrade of Sydenham Station.

The remainder of the City & Southwest project (Sydenham to Bankstown) proposes the conversion of the existing heavy rail line and the upgrade of the existing railway stations along this alignment to metro standards. This portion of the project, referred to as the Sydenham to Bankstown Upgrade, is the subject of a separate CSSI Application (No. SSI 17\_8256) for which an Environmental Impact Statement was exhibited between September and November 2017 and a Response to Submissions and Preferred Infrastructure Report was submitted to the NSW Department of Planning & Environment (DPE) in June 2018 for further exhibition and assessment.

### 1.3. Planning relationship between Pitt Street Station and the OSD

While the northern portal of Pitt Street Station and the OSD will form an integrated station development, the planning pathways defined under the *Environmental Planning and Assessment Act 1979* require separate approval for each component of the development. In

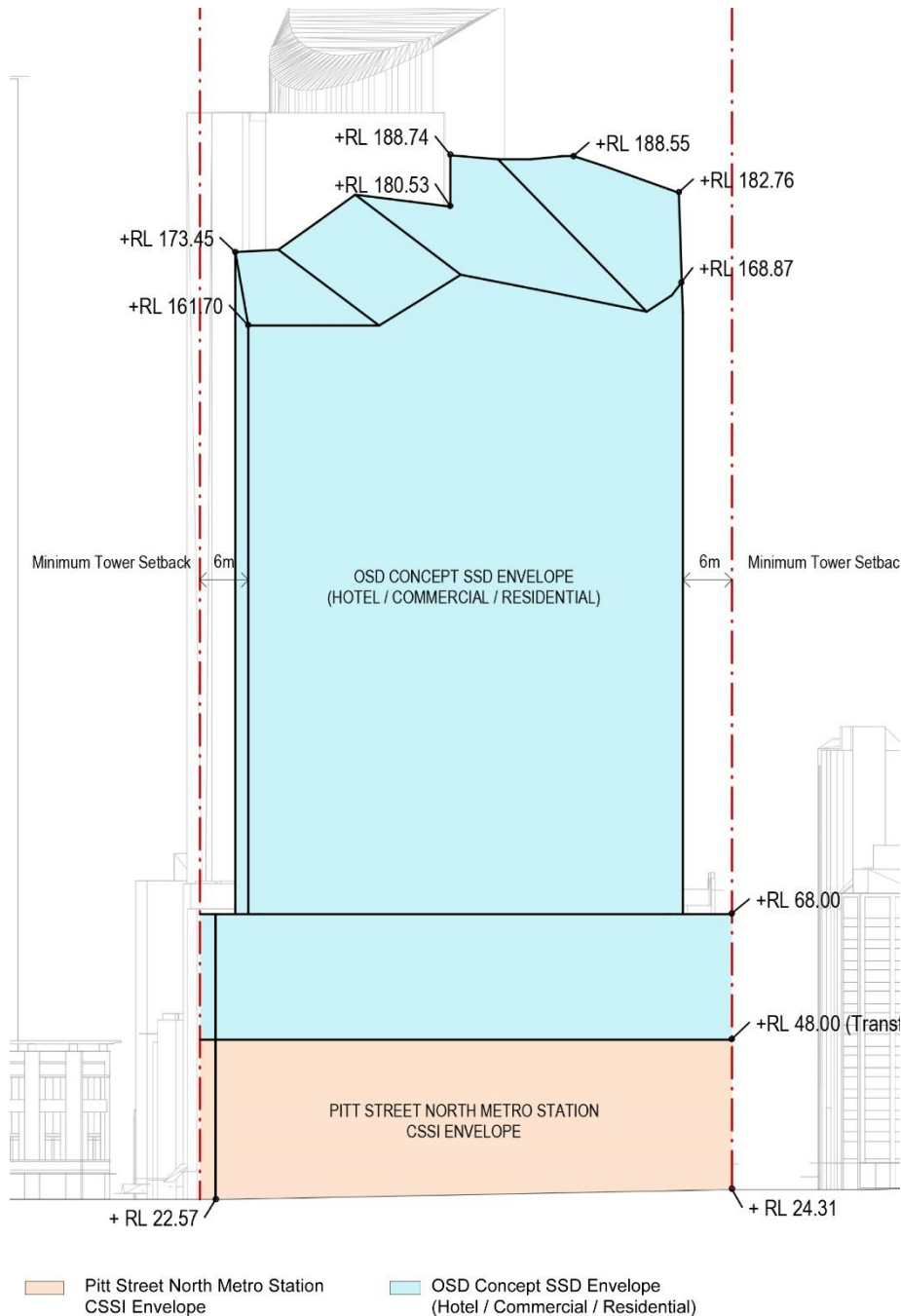


this regard, the approved station works (CSSI Approval) are subject to the provisions of Part 5.1 of the EP&A Act (now referred to as Division 5.2) and the OSD component is subject to the provisions of Part 4 of the EP&A Act.

For clarity, the approved station works under the CSSI Approval included the construction of below and above ground structures necessary for delivering the station and also enabling construction of the integrated OSD. This included but is not limited to:

- demolition of existing development
- excavation
- station structure including concourse and platforms
- lobbies
- retail spaces within the station building
- public domain improvements
- station portal link (between the northern and southern portals of Pitt Street Station)
- access arrangements including vertical transport such as escalators and lifts
- structural and service elements and the relevant space provisioning necessary for constructing OSD, such as columns and beams, space for lift cores, plant rooms, access, parking, retail and building services.

The vertical extent of the approved station works above ground level is defined by the 'transfer slab' level (which for Pitt Street North is defined by RL 48.00), above which would sit the OSD. This delineation is illustrated in **Figure 2** below.



**Figure 2:** Delineation between station and OSD

The CSSI Approval also establishes the general concept for the ground plane of Pitt Street Station including access strategies for commuters, pedestrians and workers. In this regard, pedestrian access to the station would be from Park Street and the OSD lobbies would be accessed from Pitt Street, Park Street and Castlereagh Street.

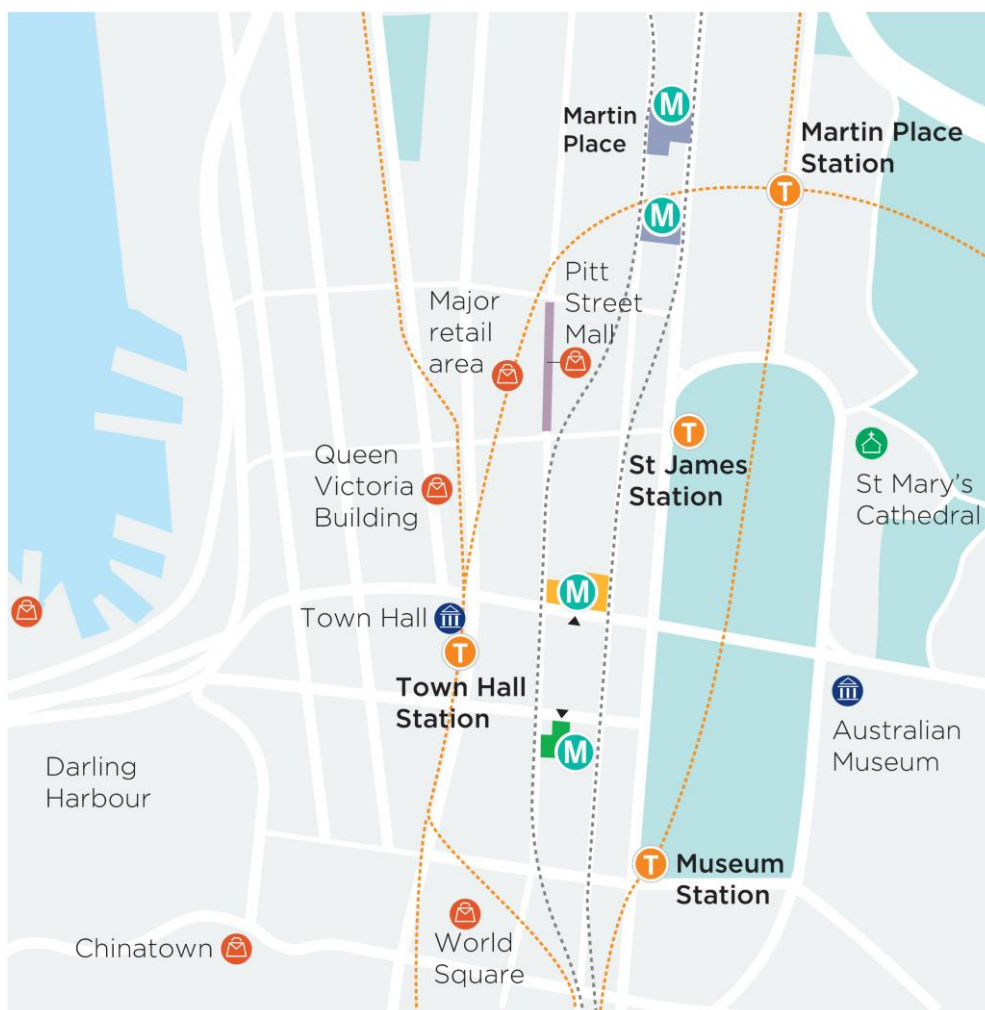
Since the issue of the CSSI Approval, Sydney Metro has undertaken sufficient design work to determine the space planning and general layout for the station and identification of those spaces within the station area that would be available for the OSD. In addition, design work has been undertaken to determine the technical requirements for the structural integration of

the OSD with the station. This level of design work has informed the concept proposal for the OSD. It is noted that ongoing design development of the works to be delivered under the CSSI Approval would continue with a view to developing an Interchange Access Plan (IAP) and Station Design Precinct Plan (SDPP) for Pitt Street Station to satisfy Conditions E92 and E101 of the CSSI Approval.

The public domain improvement works around the site would be delivered as part of the CSSI Approval.

### 1.4. The Site

The Pitt Street North OSD site is located at the southern portion of the Sydney CBD block bounded by Pitt Street, Park Street and Castlereagh Street, above the northern portal of the future Pitt Street Station (refer to **Figure 3** below).

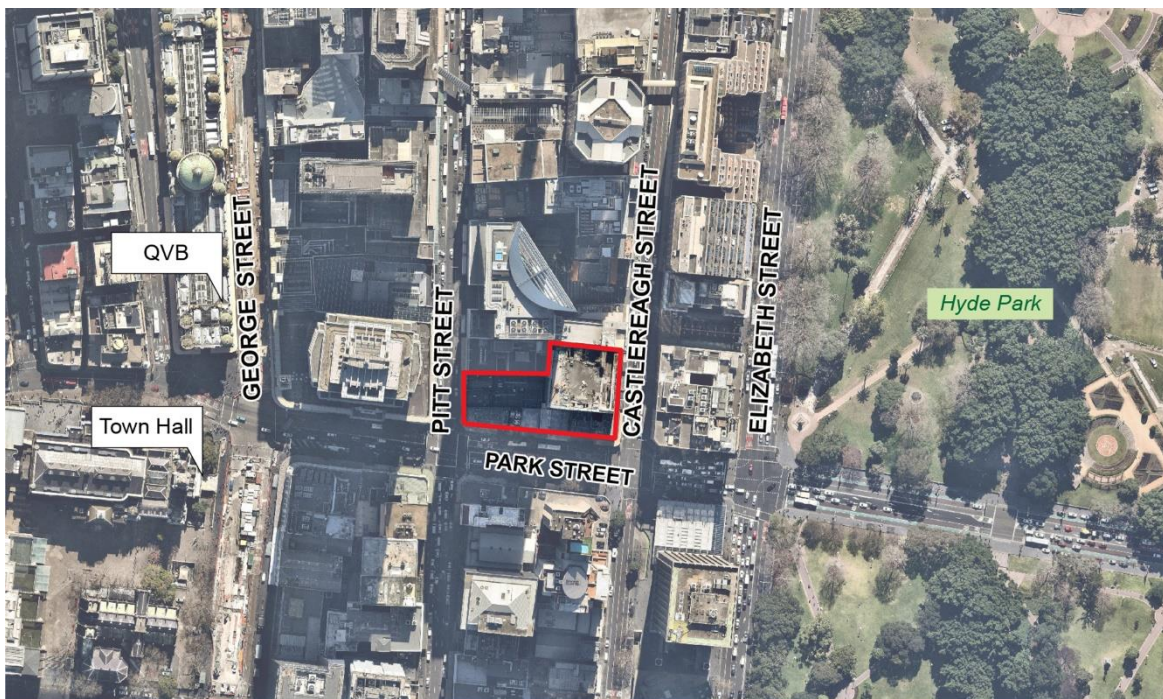


**Figure 3:** Pitt Street Station location plan

The site is located in the City of Sydney Local Government Area. The site (refer to **Figure 4** below) is irregular in shape, has a total area of approximately 3,150 square metres and has street frontages of approximately 28 metres to Pitt Street, 81 metres to Park Street and 48 metres to Castlereagh Street.

The site address is 175-183 Castlereagh Street, Sydney and comprises the following properties:

- Lot 3 in DP 74952
- Lot 1 in DP 229365
- Lot 2 in DP 900055
- Lot 1 in DP 596474
- Lot 17 in DP 1095869
- Lot 2 in DP 509677
- Lot 1 in DP 982663
- Lot 2 in DP 982663
- Lot 3 in DP 61187
- Lot 1 in DP 74367



 The Site

 NOT TO SCALE

**Figure 4:** Aerial photo of Pitt Street North



## 1.5. Overview of the proposed development

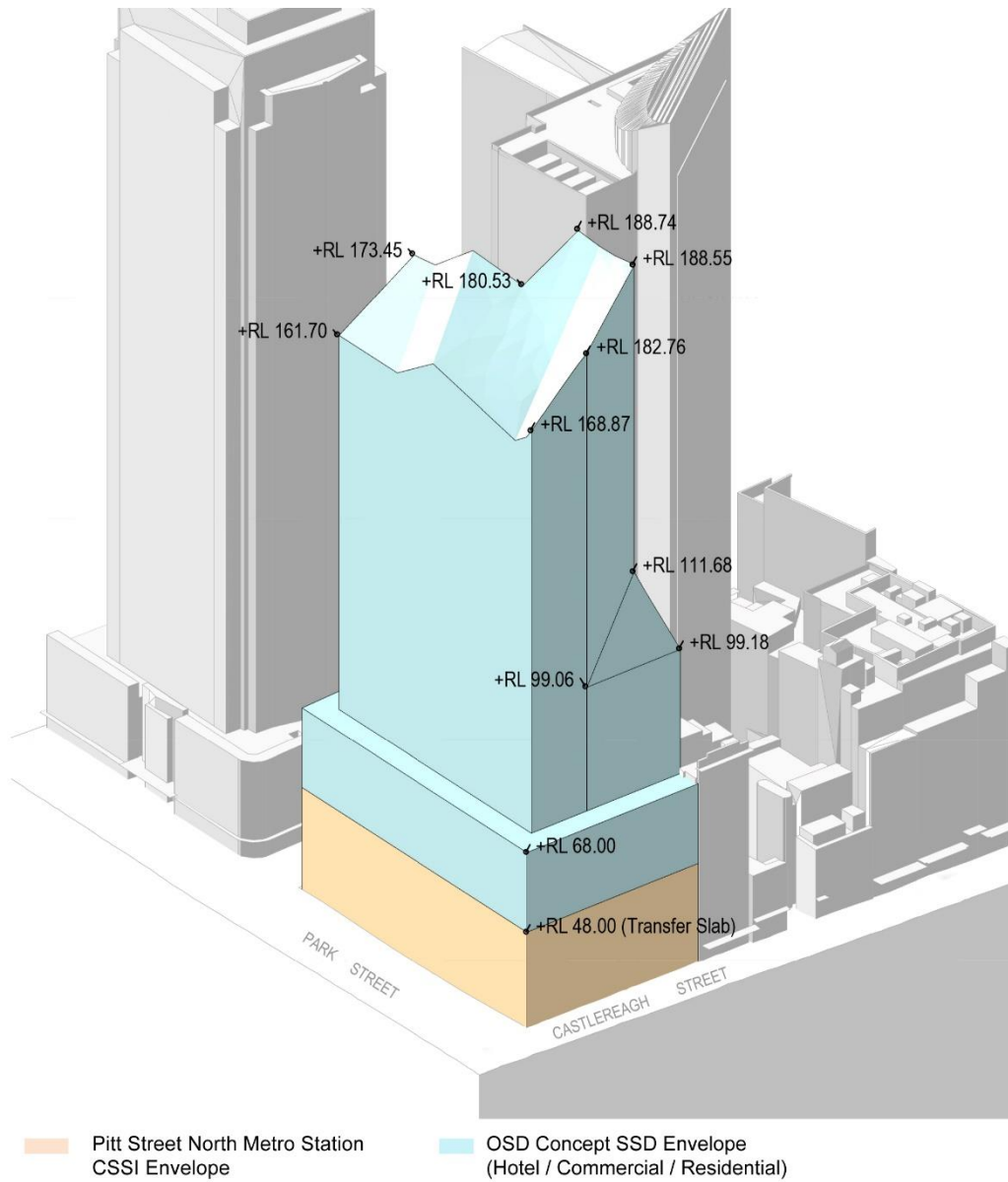
The concept SSD Application seeks concept approval in accordance with section 4.22 of the EP&A Act for the OSD above the approved Pitt Street Station (northern portal). This application establishes the planning framework and strategies to inform the detailed design of the future OSD and specifically seeks planning approval for:

- a building envelope as illustrated at Figure 5
- a maximum building height of approximately Relative Level (RL) 189 which equates to approximately 43 storeys including a podium height of RL68 (approximately 45m), which equates to approximately 12 storeys above ground
- a maximum GFA of 49,120 square metres for the OSD component, which equates to a Floor Space Ratio (FSR) of 15.59:1, resulting in a total maximum GFA at the site (including station floorspace) of 50,309 square metres and a total maximum FSR of 15.97:1, including flexibility to enable a change in the composition of land uses within the maximum FSR sought
- conceptual use of the building envelope for a range of uses including commercial office space, visitor accommodation and residential accommodation
- use of the conceptual OSD space provisioning within the footprint of the CSSI Approval (both above and below ground), including the OSD lobby areas, podium car parking, storage facilities, services and back-of-house facilities
- car parking for approximately 50 spaces located across five levels of the podium
- loading and vehicular access arrangements from Pitt Street
- pedestrian access from Pitt Street, Park Street and Castlereagh Street
- strategies for utilities and service provision
- strategies for the management of stormwater and drainage
- a strategy for the achievement of ecologically sustainable development
- indicative signage zones
- a strategy for public art
- a design excellence framework
- the future subdivision of parts of the OSD footprint (if required)

As this concept SSD Application is a staged development pursuant to section 4.22 of the EP&A Act, future approval would be sought for detailed design and construction of the OSD. A concept indicative design, showing a potential building form outcome at the site, has been provided as part of this concept SSD Application at Appendix E.

Pitt Street Station is to be a key station on the future Sydney Metro network, providing access to the Sydney Central Business District (CBD). The proposal combines the metro station with a significant mixed use tower, contributing to the Sydney skyline. The OSD would assist in strengthening the role of Central Sydney as the key centre of business in Australia and would contribute to the diversity, amenity and sustainability of the CBD.

It is noted that Pitt Street Station southern portal OSD has been subject to a separate application, and does not form part of this concept SSD Application.



**Figure 5:** Pitt Street North OSD building, including OSD components (orange) and station box (grey)



Figure 6: Pitt Street North OSD indicative design, as seen from eastern, southern and western elevations

## 1.6. Staging and framework for managing environmental impacts

Sydney Metro proposes to procure the delivery of the Pitt Street North integrated station development in one single package, which would entail the following works:

- station structure
- station fit-out, including mechanical and electrical
- OSD structure
- OSD fit-out, including mechanical and electrical.

Separate delivery packages are also proposed by Sydney Metro to deliver the excavation of the station boxes/shafts ahead of the ISD delivery package, and line-wide systems (e.g. track, power, ventilation) and operational readiness works prior to the Sydney Metro City & Southwest metro system being able to operate.

Three possible staging scenarios have been identified for delivery of the integrated station development:

1. Scenario 1 – the station and OSD are constructed concurrently by constructing the transfer slab first and then building in both directions. Both the station and OSD would be completed in 2024.

2. Scenario 2 – the station is constructed first and ready for operation in 2024. OSD construction may still be incomplete or soon ready to commence after station construction is completed. This means that some or all OSD construction is likely to still be underway upon opening of the station in 2024.
3. Scenario 3 – the station is constructed first and ready for operation in 2024. The OSD is built at a later stage, with timing yet to be determined. This creates two distinct construction periods for the station and OSD.

Scenario 1 represents Sydney Metro's preferred option as it would provide for completion of the full integrated station development and therefore the optimum public benefit at the site at the earliest date possible (i.e. on or near 2024 when the station is operational). However, given the delivery of the OSD could be influenced by property market forces, Scenarios 2 or 3 could also occur, where there is a lag between completion of the station component of the ISD (station open and operational), and a subsequent development.

The final staging for the delivery of the OSD would be resolved as part of the detailed SSD application(s).

For the purposes of providing a high level assessment of the potential environmental impacts associated with construction, the following have been considered:

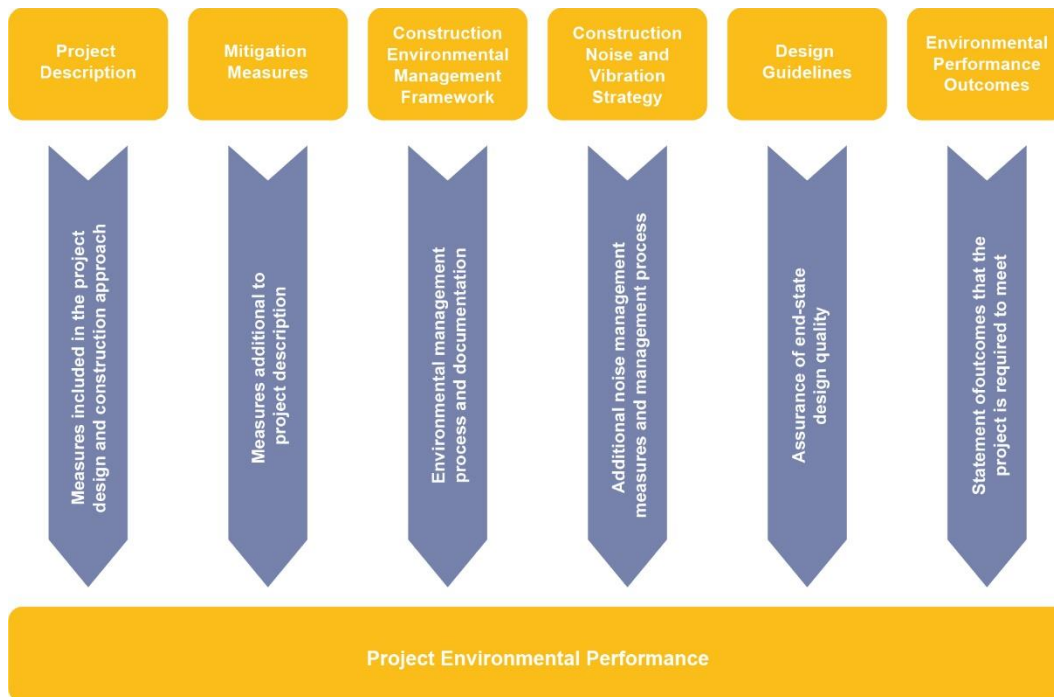
- Impacts directly associated with the OSD, the subject of this SSD application
- Cumulative impacts of the construction of the OSD at the same time as the station works (subject of the CSSI Approval).

Given the integration of the delivery of the Sydney Metro City & Southwest metro station with an OSD development, Sydney Metro proposes the framework detailed in

**Figure 7** to manage the design and environmental impacts, consistent with the framework adopted for the CSSI Approval, which includes:

- project design – measures which are inherent in the design of the project to avoid and minimise impacts
- mitigation measures – additional to the project design which are identified through the environmental impact assessment
- construction environmental management framework – details the management processes and documentation for the project
- construction noise and vibration strategy – identifies measures to manage construction noise and vibration
- design guidelines – provides an assurance of end-state quality
- environmental performance outcomes – establishes intended outcomes which would be achieved by the project





**Figure 7: Project approach to environmental mitigation and management**

Sydney Metro proposes to implement a similar environmental management framework where the integrated delivery of the CSSI station works and the OSD occur concurrently. This would ensure a consistent approach to management of design interface and construction-related issues.

Sydney Metro proposes this environmental management framework would apply to the OSD until completion of the station and public domain components of the integrated station development delivery contract (i.e. those works under the CSSI Approval). Should the OSD be constructed beyond the practical completion and opening of the section, standard practices for managing construction related environmental impacts would apply in accordance with the relevant guidelines and Conditions of Approval for the detailed SSD application(s).

### 1.7. Assumptions and limitations

The assessment is based on the following assumptions and limitations:

- The traffic generation rates as stated 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) are generally conservative given the characteristics of the planned uses
- Traffic distribution is based on information extracted from BTS Journey to Work data for the Sydney CBD area
- The land uses are consistent with the detail provided in the concept plan SSD 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 impact from the proposed construction activity on surrounding development is expected to be managed through the staging of the OSD development. The construction staging and associated construction management arrangements for the Pitt Street North OSD is presented in the *Pitt Street North Over Station Development Construction Management Statement*
- Pedestrian implications of the Metro Station and OSD development have been considered in the *Pedestrian Modelling Report – Precinct, Pitt Street Station* (prepared by METRON for Sydney Metro, May 2018).

## 1.8. Report structure

The report is structured as follows:

- **This section** – introduces the project, its relationship with Sydney Metro and previous planning approvals, the SEARs for this proposal, the purpose and limitations of the report, an overview of the site and its proximity within Sydney CBD, and an overview of the proposed development and its key features
- **Section 2** – covers the scope of the assessment
- **Section 3** – covers relevant legislation, policies and guidelines and its association with the traffic and transport elements of this application
- **Section 4** – provides an understanding of the existing situation including area and network characteristics and the service and facility conditions
- **Section 5** – defines the transport, traffic, parking and access attributes of the proposal that form the basis for the assessment in Section 6
- **Section 6** – assesses the transport, traffic, parking, servicing and access impacts from the likely operations of the proposed OSD Concept Design
- **Section 7** – summarises the proposal options for managing the construction of the OSD Concept and highlights the construction management principles that are recommended to be adopted
- **Section 8** – summarises how the transport and traffic elements of the SEARs have been addressed, the key findings and recommended mitigation measures for future stages in the planning process.

## 2. Scope of assessment

This report is based on the Indicative OSD Design drawings (Revision 1) provided by Sydney Metro (thereafter referred to as the Indicative OSD Design).

This report documents the traffic and transport impact assessment that has been undertaken for the Indicative OSD Design. It discusses the forecast impacts on the surrounding road / pedestrian network from the proposed development and its traffic / pedestrian generation, parking (vehicle and bicycle) and servicing requirements.

Owing to the OSD's location above the CSSI approved Pitt Street Station, a series of collaboration workshops have been undertaken with Sydney Metro's Stage 1 Design Team (Design Team) to coordinate the designs, identify challenges and propose solutions. This occurred as the Design Team advanced towards the concept design.

The assessment includes the traffic and transport arrangements required to service the residential apartments, hotel uses and commercial floor space in the Indicative OSD Design prepared by Sydney Metro.

The assessment incorporates:

- Review of relevant legislation, policies and guidelines associated with traffic and transport
- Consultation with Sydney Metro regarding traffic and pedestrian interaction, parking and servicing requirements
- Extensive consultation with Sydney Co-ordination Office (SCO) to define and refine the operational aspects of the proposal to identify and include conflict resolution and mitigation measures into the design. In particular, SCO and the Design Team have worked through the following issues to achieve an improved design outcome:
  - Loading and servicing arrangements of the indicative OSD and station development
  - Vehicle access and pedestrian interactions
  - Consideration of existing and future cycle provisions
  - Coach and taxi operations for the proposed Hotel use
  - Pedestrian waiting areas at bus stops on Park Street
- Assessment of the forecast traffic and pedestrian impacts resulting from the operation of the proposed Indicative OSD Design
- Assessment of the car parking, access and service dock design layout provided by Sydney Metro

### 3. Regulatory context

The following documents provide a number of transport planning provisions, goals and strategic planning objectives which are relevant to the proposal.

#### 3.1. Sydney Local Environment Plan 2012

The Sydney Local Environmental Plan (LEP) 2012 applies to developments within the City of Sydney local area. The LEP stipulates the maximum number of on-site car parking spaces that are to be provided as part of new developments within the City of Sydney. Parking provisions for new developments depend on the type of land use, its location and its level of accessibility by public transport.

The LEP stipulates the maximum parking provision for new developments under Clauses 7.5 to 7.7 for residential flat buildings, office/business premises, and retail premises. Parking provisions for other land uses, including hotel accommodation is contained in Clause 7.9.

The Pitt Street North OSD site previously had over 170 on site car parking and service vehicle spaces, accessed from Castlereagh Street. The OSD proposal will significantly reduce the provision of on site parking, consistent with the objectives of the LEP 2012 to reduce private vehicle movements in the CBD through on site parking restrictions.

The application of the LEP car parking requirements to the proposed Pitt Street North OSD are considered and assessed in Section 5 of this report.

#### 3.2. Sydney Development Control Plan 2012

The Sydney Development Control Plan (DCP) 2012 is not applicable to State Significant Development (in accordance with Clause 11 of the State and Regional Development SEPP), however the proposal has been designed to align with the DCP wherever possible.

Although the DCP is not applicable to the SSD, it provides a guide to the minimum number of bicycle parking spaces to be provided by new developments. These guidelines have been considered in the assessment of bicycle parking provisions in Section 5 of this report.

#### 3.3. State Environmental Planning Policy (Infrastructure) 2007

The aim of the Infrastructure SEPP is to facilitate the provision of infrastructure across NSW. Clauses relevant to the development include:

##### **Clause 88B: Development near proposed metro stations**

A consent authority must not grant consent to development on land to which this clause applies unless it has taken into consideration:

- Whether the proposed development will adversely affect the development and operation of a proposed metro station, including by impeding access to, or egress from, the proposed metro station

- Whether the proposed development will encourage the increased use of public transport

The proposed development is to be constructed above the entrance to the Pitt Street (north) Station and will not adversely affect access / egress to the proposed Sydney Metro Station. Furthermore, the station is likely to encourage and facilitate the increased use of public transport to and from the development.

#### **Clause 104: Traffic-generating development**

This clause sets out thresholds for scale of new or extended development, above which the consenting authority must:

- a) Give written notice of the application to Roads and Maritime Services (Roads and Maritime) within 7 days after the application is made, and
- b) Take into consideration:
  - i. Any submission that RMS provides in response to that notice within 21 days after the notice was given (unless, before the 21 days have passed, RMS advises that it will not be making a submission), and
  - ii. The accessibility of the site concerned, including:
    - The efficiency of movement of people and freight to and from the site and the extent of multi-purpose trips, and
    - The potential to minimise the need for travel by car and to maximise movement of freight in containers or bulk freight by rail, and
  - iii. Any potential traffic safety, road congestion or parking implications of the development.

The consent authority must follow these steps when assessing the development application submitted for this development.

This traffic impact assessment has been prepared in response to the SEARs and to assess how the proposed OSD impacts these SEPP criteria, and where necessary describe possible mitigation measures to ensure the efficiency of movement, reduce the need for private car travel and address any traffic safety, congestion and parking impacts.

### **3.4. Greater Sydney Region Plan**

In March 2018 A Metropolis of Three Cities – the Greater Sydney Region Plan was released. The plan, along with Transport for NSW's Future Transport 2056 and Infrastructure NSW's State Infrastructure Strategy 2018-36 will bring to life the vision of Greater Sydney as a vibrant and sustainable metropolis of the Eastern Harbour City, Central River City and Western Parkland City.

The plan provides strategic direction for Sydney's productivity, environmental management, and liveability; and for the location of housing, employment, infrastructure and open space.

The Plan's vision is to maintain Sydney's position as a strong global city and a great place to live. The proposed OSD development is part of the Pitt Street Station that will contribute to the implementation of a world class transport system that is connected, accessible and can accommodate the future demands of a growing population.

### 3.5. Central City District Plan

This document outlines the Greater Sydney Commission's newly released plan (March 2018) to manage growth for the Central District of Greater Sydney over the next 20 years. It is a city-shaping tool that focuses on improving accessibility to jobs and services and to support additional housing supply.

The Plan focuses on making Greater Sydney a more liveable, productive and sustainable city. This will be facilitated by additional infrastructure and services in both the private and public transport domains. The District Plan responds to major transport investments, or 'city-shaping transport' in the district, such as Sydney Metro Northwest and Parramatta Light Rail.

The development of the Metro Project (including the Pitt Street North OSD project) is consistent with the Central City District Plan.

The introduction of the Pitt Street Station will help strengthen the transport connection from the Harbour CBD to the Eastern Economic Corridor and the North District through more frequent and better connected rail services. The proposed OSD located above the Pitt Street Station will help expand the catchment of accessibility for residential and employment land uses through non-car modes of travel by taking advantage of this important transport connection.

### 3.6. Future Transport Strategy 2056

The *Future Transport Strategy 2056* is NSW Government's framework for planning and improving NSW transport system and was developed as part of the 5-year update to the 2012 Long Term Transport Master Plan for NSW.

The plan enables Sydney to prepare for a period of population growth with a vision for setting a pathway up to 2056. This vision is based on Greater Sydney being a metropolis of three cities (Eastern Harbour City, Central River City and Western Parkland City).

The strategy to accommodate population growth seeks to take advantage of technological enabled mobility that offers opportunities to maximise travel by car free alternatives within Sydney. This includes the transformation of the mass transit network to align with a 30 minute trip to services and employment. It also recognises the role of automation and how it can help to improve safety, travel choices and mode concepts, service frequency, reliability and travel times for customers when travelling within and around Sydney's transport network.

Sydney Metro City and Southwest and the proposed Pitt Street station form a key part of this future vision. It offers a modern technologically advanced public transport system solution, which through the provision of a strategic public transport hub, supports both place making and efficient connections to and from the Sydney CBD.

Future activity generated by the proposed OSD (this application) will directly benefit from Sydney Metro, which will help to appropriately manage its impacts through its proximity within the Sydney CBD and its alignment with the objectives of this Strategy.

### 3.7. Sustainable Sydney 2030

The plan for Sydney moving forward is to become a green city, while delivering world class services and competing economically on a global scale. Sustainable transport networks are key for Sydney to achieve this, and the Sydney Metro and proposed OSD will help contribute to creating a more sustainable and active transport system within the CBD and inner city suburbs.

### 3.8. Sydney's Bus Future

Sydney's Bus Future (Transport for NSW, 2013) provides the framework for improving and delivering more frequent and reliable bus services throughout Sydney. The core aim of the strategy is to provide an integrated bus network with seamless connections to other transport services.

The strategy also aims to tailor bus services to customer needs. In this vein, bus services will be focused into three key types, with associated priority and infrastructure investment:

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

The Pitt Street North OSD project will not impede the implementation of Sydney's Bus Future, acknowledging that the site's Park Street frontage will become a significant bus interchange with the Metro line.



### 3.9. Sydney's Walking Future

*Sydney's Walking Future* (Transport for NSW, 2013) sets out a strategy to encourage people in Sydney to walk more through actions that make it a more convenient, better connected and safer mode of transport.

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

- NSW Government commitment to invest in new walking links that connect people to public transport
- Prioritisation of investment in walking infrastructure to be prioritised within 2km of centres and public transport interchanges
- Commitment to invest in walking facilities as part of the Transport Access Program, including improved circulation spaces around station precincts and safer walking links.

The highest number of walking trips per day are made by people who live in Sydney (3.4 trips), Leichhardt (2.9 trips) and North Sydney (2.8 trips), with walking to work taking place more often around major centres.

With the highest number of walking trips per day taking place in Sydney CBD, and with the introduction of a metro station, the Pitt Street North OSD development is well placed to take advantage of this strategy to encourage walking trips to and from the site.

### 3.10. Sydney's Cycling Future

*Sydney's Cycling Future* (Transport for NSW, 2013) provides a framework for the way cycling is planned and prioritised in Sydney. It aims to grow the number of people cycling for transport by investing in safe, connected networks, making better use of existing infrastructure and fostering the formation of partnerships to develop cycling infrastructure.

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

- A safe and connected bicycle network benefits the wider transport network by improving access to towns and centres, reducing congestion and increasing capacity on the public transport system
- The promotion of safe separation of cyclists from motor vehicles and pedestrians where possible
- Investment in bicycle infrastructure should be prioritised within 5km of public transport interchanges to provide improved connections
- Promoting 'bike-and-ride' at major public transport interchanges including secure parking facilities integrated with public transport access.

The City of Sydney Council is moving towards a well-connected cycle network to improve accessibility for workers and visitors to the CBD. This includes the proposed provision of a dedicated cycle path along the site's frontage to Castlereagh Street.



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The development would encourage people to cycle by providing high quality end-of-trip facilities for employees and visitors.

### 3.11. Relevant policies and guidelines

The following documents have also been considered in the development of this report:

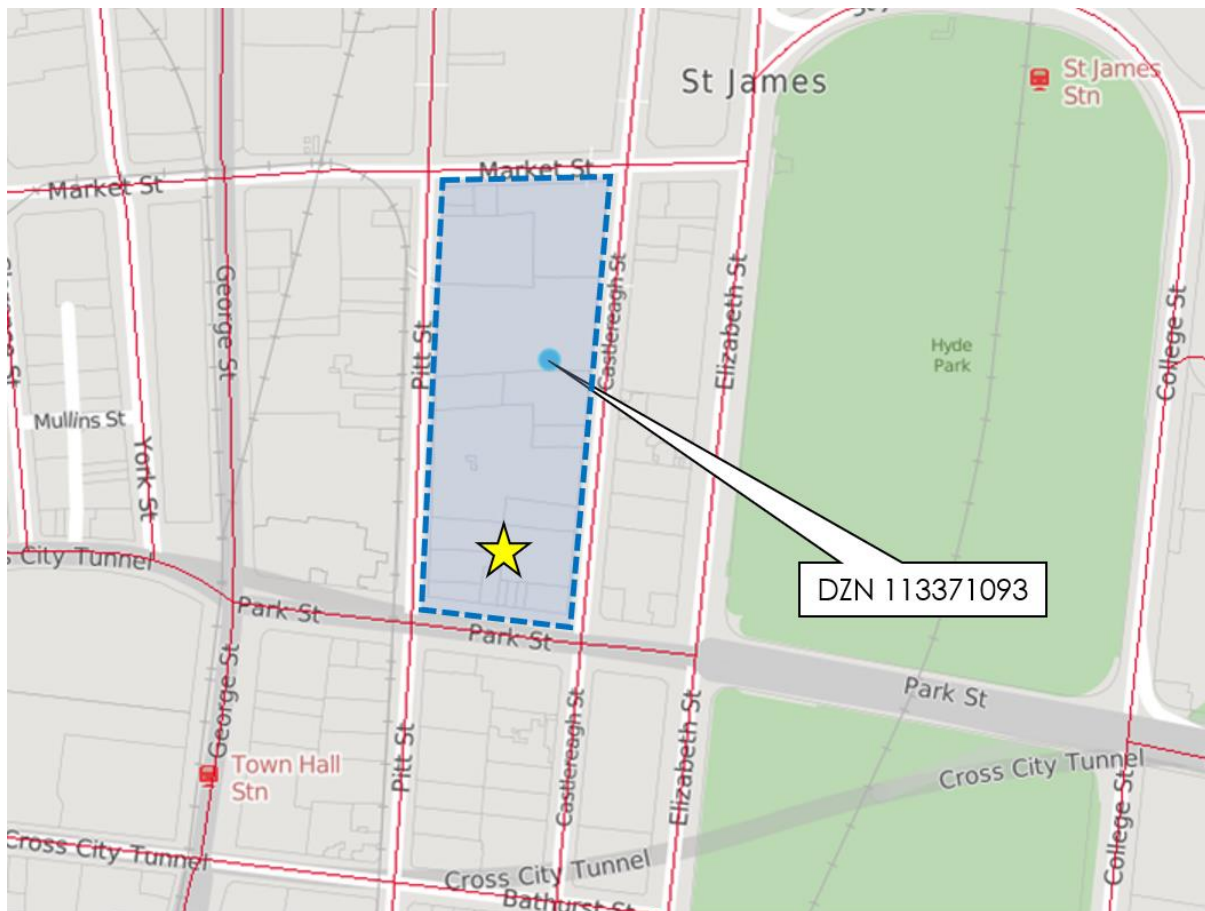
- Roads and Maritime Services Guide to Traffic Generating Developments
- Australian Standard - AS2890 Parking Facilities Parts 1 – 6
- Relevant Austroads documents.

## 4. Existing conditions

### 4.1. Existing travel patterns

#### 4.1.1. Journey to work

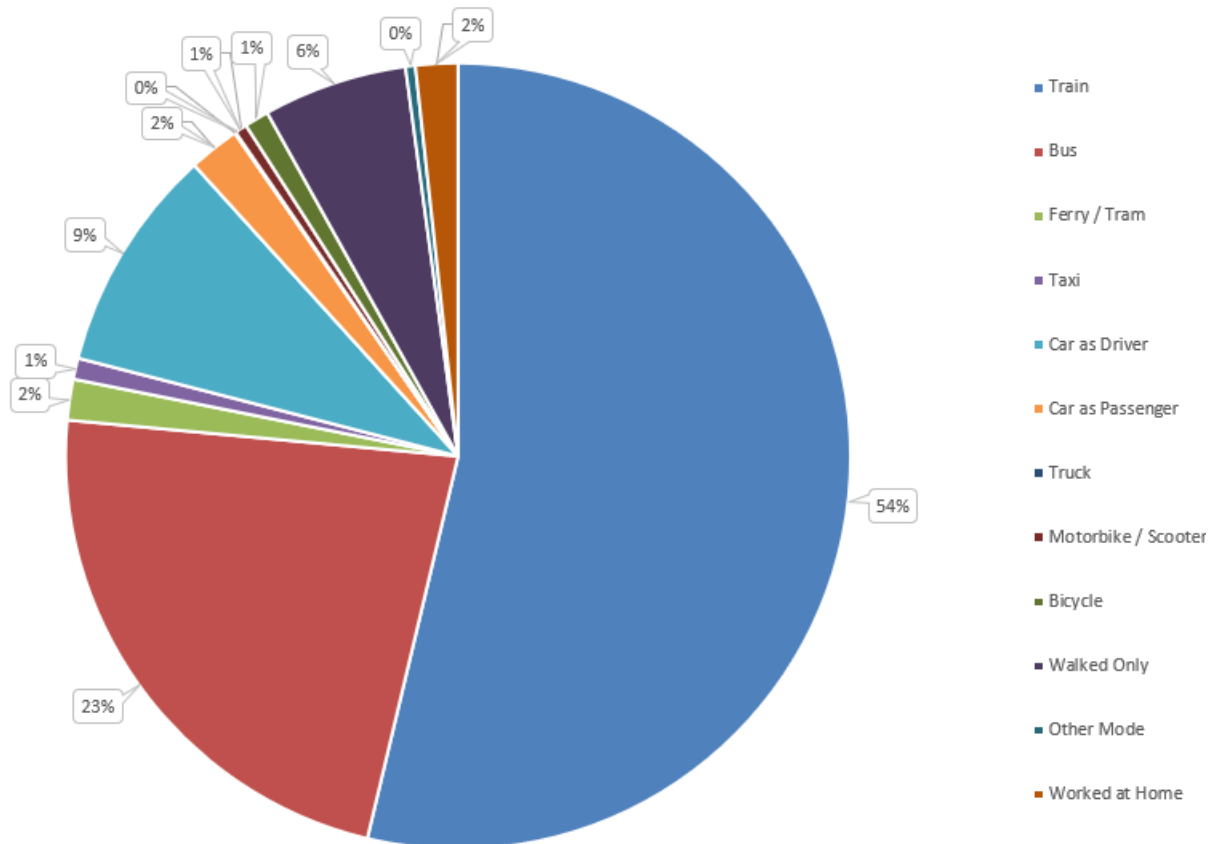
Commuter information of employees travelling to the area of the subject site have been assessed based on TfNSW's 2016 *Journey to Work (JTW)* data. The subject site is located in destination Zone (DZN) 113371093, as shown in **Figure 8**.



**Figure 8:** Destination Zone at Site

Approximately 8,167 employees have been recorded within DZN 113371093. More than half commute to work by train (54%) while 23% travel by bus. Private car as a mode of transport makes up 11% of all trips (9% as driver and 2% as car passenger). This suggests that public transport is the primary mode of transport for commuters. Bicycle travel represents 1% while walk only accounted for 7% of all trips.

A breakdown of the modes people used to commute to work located within the nominated Travel Zone is given in **Figure 9**.



**Figure 9:** Mode of Transport to Work – Employees in DZN 113371093

**Figure 9** highlights the following travel characteristics for the people who work in the immediate vicinity of the Pitt Street North site and indicates:

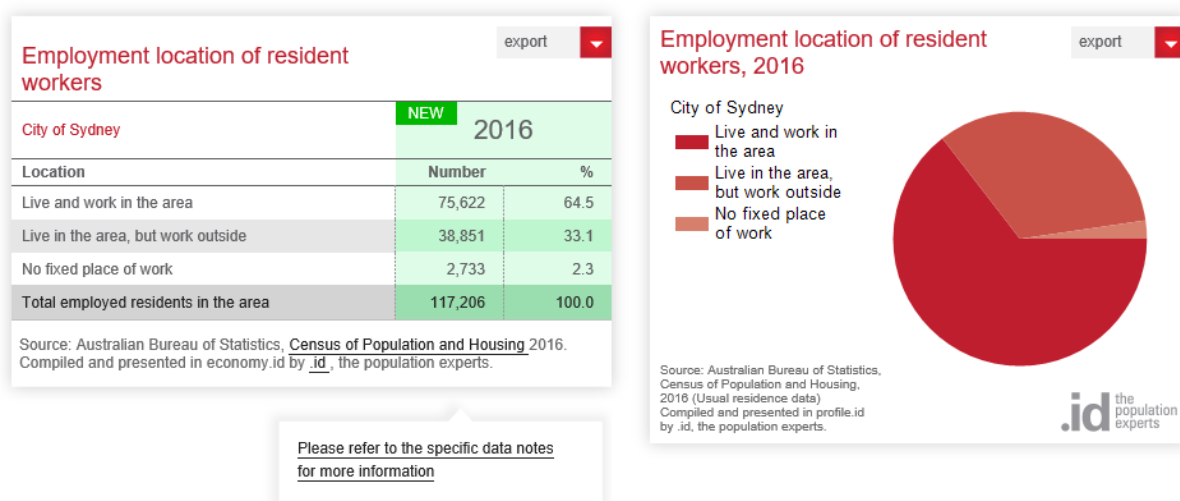
- The current high proportion of journey to work trips that are made by train, which highlights that approximately 53 per cent of trips are attributable to this mode
- A total public transport mode share of 80 per cent, which is significantly greater than the Greater Sydney average of 20 per cent
- A low proportion of private vehicle trips, which currently represents just 11% of trips to the area
- High percentage of ‘walk only’ trips (6% of total trips).

These statistics reflect the area’s characteristics and are influenced by high public transport service levels, good levels of connectivity to surrounding catchments, local and surrounding density levels and its proximity to the Sydney CBD and public transport catchments.

The construction and opening of the Sydney Metro City and Southwest (C&SW) line (including Pitt Street Station), will enhance the accessibility of the Sydney CBD for public transport trips. This would see a potential reduction in the proportion of private vehicle generated trips and an increase in the public / active transport mode share for Sydney in the future.

#### 4.1.2. Sydney CBD residents' location of employment and mode of travel

As shown in **Figure 10** a high proportion of residents living in the Sydney CBD also work within the CBD (65% of employed workers). As a result, the journey to work is both a short trip and potentially well connected by public transport, cycle links and pedestrian facilities.



**Figure 10:** Sydney CBD Employment Location (2016)

**Source – <https://profile.id.com.au>**

As shown in **Figure 11** residents of the Sydney CBD whom work within the Sydney CBD, walking is by far the dominate mode of travel to work with 45% of trips. Public transport modes including train, bus, tram and ferry combined represent 33% of trips. Private car travel represents less than 10% of trips.

## Method of travel to work

export  reset 

Main method of travel	NEW 2016			2011			Change 2011 to 2016
	Number	%	Greater Sydney %	Number	%	Greater Sydney %	
Train	2,201	22.0	16.2	1,120	15.3	13.8	+1,081
Bus	1,024	10.2	6.1	802	11.0	5.8	+222
Tram or Ferry	62	0.6	0.4	16	0.2	0.4	+46
Taxi	68	0.7	0.2	129	1.8	0.3	-61
Car - as driver	842	8.4	52.7	671	9.2	53.7	+171
Car - as passenger	152	1.5	3.9	90	1.2	4.5	+62
Truck	0	—	0.9	3	0.0	1.1	-3
Motorbike	17	0.2	0.7	5	0.1	0.6	+12
a Bicycle	59	0.6	0.7	36	0.5	0.8	+23
a Walked only	4,458	44.5	4.0	3,596	49.2	4.1	+862
Other	87	0.9	1.1	103	1.4	1.0	-16
a Worked at home	348	3.5	4.4	231	3.2	4.0	+117
Did not go to work	572	5.7	7.8	432	5.9	8.6	+140
Not stated	133	1.3	0.9	74	1.0	1.5	+59
<b>Total employed persons aged 15+</b>	<b>10,026</b>	<b>100.0</b>	<b>100.0</b>	<b>7,312</b>	<b>100.0</b>	<b>100.0</b>	<b>+2,715</b>

**Figure 11:** Sydney CBD Residents Mode of Travel to Sydney Employment Locations – 2016 v 2011

**Source –** <https://profile.id.com.au>

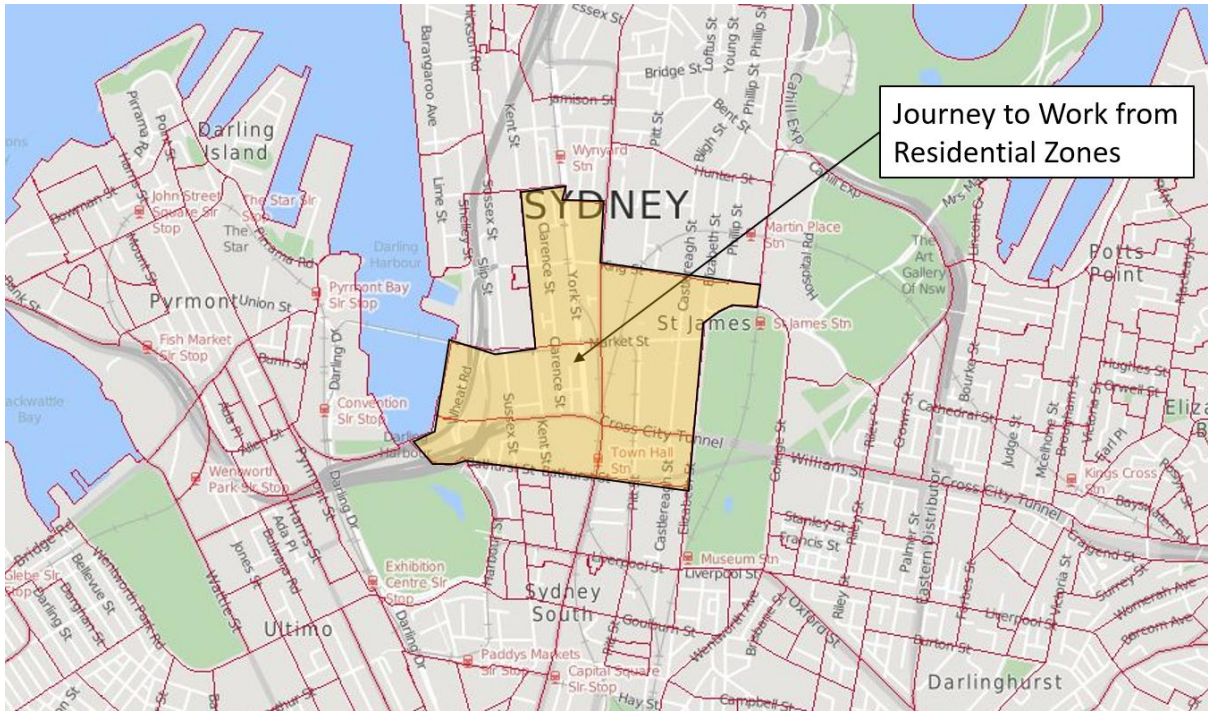
### 4.1.3. CBD residents' location of employment and mode of travel

The indicative OSD design includes residential uses of approximately 300 new apartments located directly above a new railway station. For the Indicative OSD design the general Sydney CBD travel patterns for residents has particular relevance and suggests that of the majority of the future residents of the site will work within the Sydney CBD, the majority of which are likely to travel to work by foot or public transport.

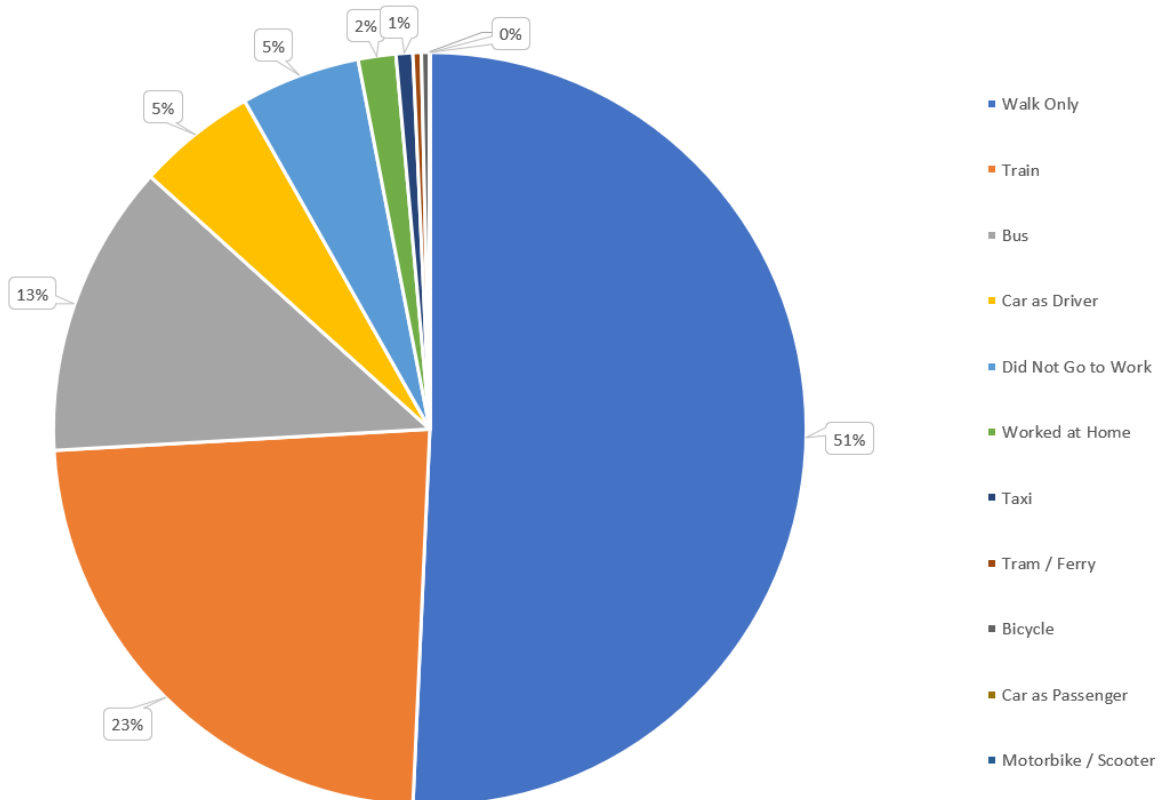
Based on TfNSW's 2016 *Journey to Work* (JTW) data, the existing mode of travel to work for residents living within the vicinity of the Indicative OSD site has been assessed (see **Figure 12**).

A breakdown of the modes people used to commute to work from CBD areas surrounding the site is shown in **Figure 13**.

As shown in **Figure 13** residents of the immediate area surrounding the Indicative OSD site, walking is by far the dominate mode of travel to work with 51% of trips. Public transport modes including train, bus, tram and ferry combined represent 37% of trips. Private car travel represents only 5% of total trips.



**Figure 12:** Residents Journey to Work from Residential Zones surrounding the site



**Figure 13:** Mode of Transport to Work – Residents surrounding the Site



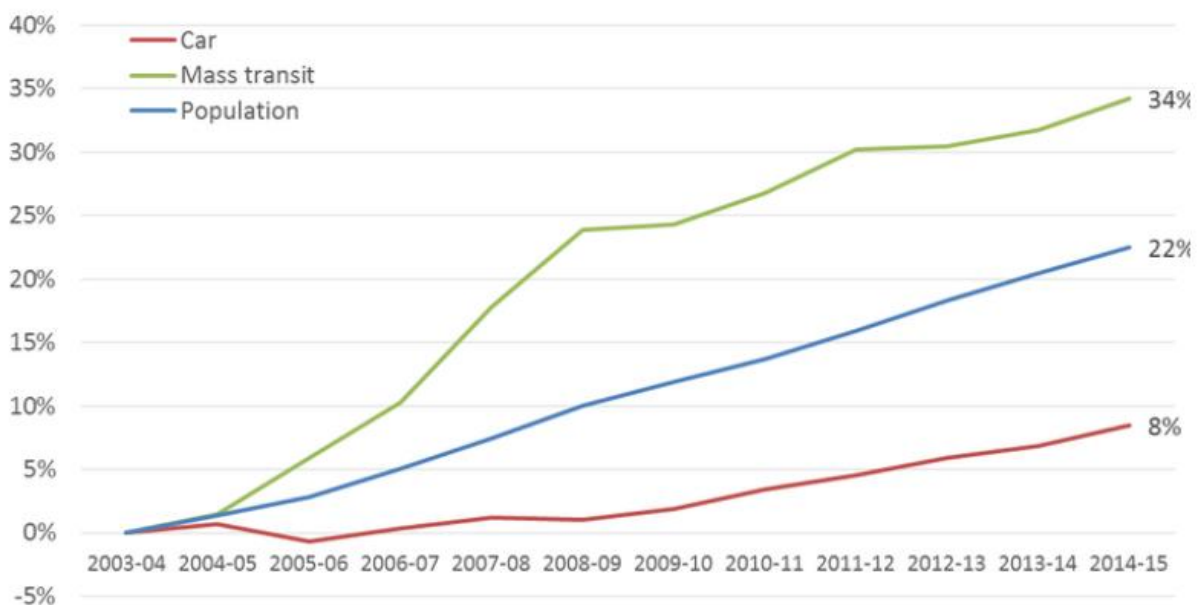
#### 4.1.4. Trends in Australian transport

Charting Transport is a website that reviews transport data and the trends of how people travel in Australian cities. This includes research on growth in car travel plotted against population growth and mass transit passenger kilometres travelled in Australia’s five largest cities. The website displays data taken from the Bureau of Infrastructure, Transport, and Regional Economics (BITRE) 2016 yearbook.

The key extracted data from this study is presented in **Figure 14** and highlights that mass transit use is currently outpacing growth in car travel and growth in population. The data highlights that reduced growth in car travel has continued since 2003-04 across all of the cities analysed. The data also highlights that car travel growth is also significantly lower than the rate of population growth.

This trend is generally reflective of a number of factors including:

- Investment in public transport infrastructure and services
- Improvements in public transport services and monitoring of customer targets and reliability
- A larger proportion of the population living in cities in proximity of centres and transport nodes
- The trend of intensification of land uses around the transit lines and stations
- Reduced parking provision and strengthening of parking management in CBD locations.



**Figure 14: Growth in car and mass transit passenger km in Australia's five largest cities**

Source: Charting Transport, 2017 with reference to BITRE 2016 yearbook

## 4.2. Road network traffic conditions

The subject site is surrounded by a network of collector roads and local streets. A description of these roads is provided below.

**Park Street** functions as a two-way collector road and travels in an east-west alignment in the vicinity of the site. The road is generally configured with six lanes inclusive of two bus lanes and extends between George Street and College Street. The road is restricted to bus only for eastbound movements, west of the intersection of Park Street and Pitt Street.

Park Street forms the southern boundary of the site. Multiple bus zones are located on the road in the immediate area of the site. There is no on-street parking permitted on Park Street in the area surrounding the subject site.

**Pitt Street** functions as a one-way northbound local road, aligned in a north-south direction. The road is generally configured with two lanes with kerbside car parking provided on either side. The road provides northbound connectivity from George Street/Lee Street to Market Street with traffic signals provided at both intersections.

**Castlereagh Street** functions as a southbound one-way local road aligned in a north-south direction. The road is generally configured with two lanes including one bus lane and extends between Bent Street and Hay Street. Ticketed restricted kerbside parking is generally provided on either side of the road.

Roads and Maritime's SCATS data has been assessed to identify the weekday and weekend traffic flows on roads surrounding the subject site. This data has been obtained as part of the works for Sydney Light Rail Project which were carried out in May 2017.

The block which the subject site is located in is bounded by Market Street to the north, Castlereagh Street to the east, Park Street to the south, and Pitt Street to the west. Traffic flows on these roads are summarised in **Figure 15** and **Table 1**.



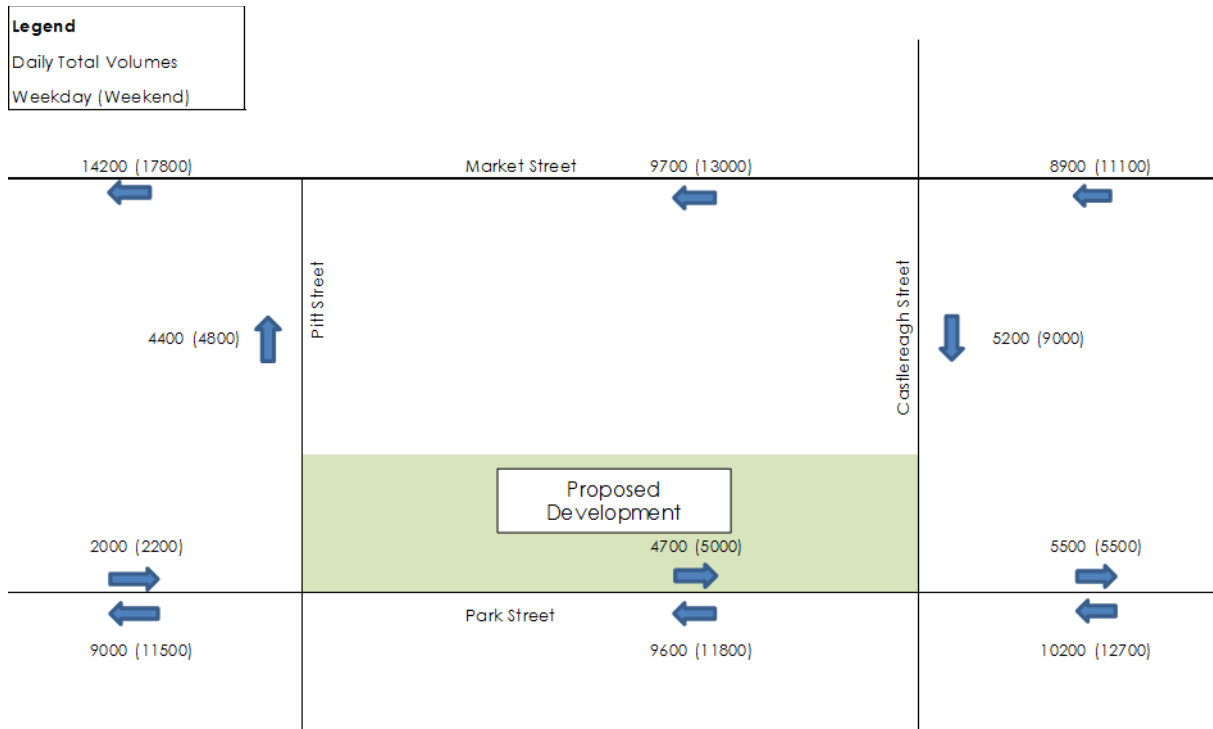


Figure 15: Existing (2017) Daily Traffic Flows

Table 1: Traffic Flows on Surrounding Road Network (2017)

Road	Direction	Daily Vehicle Flows Weekday	Daily Vehicle Flows Weekend
Market Street (one way)	Westbound	9,710	12,950
Castlereagh Street (one way)	Southbound	9,870	9,040
Park Street	Eastbound	4,690	5,030
Park Street	Westbound	9,630	11,800
Pitt Street (one way)	Northbound	4,440	4,840

Source: SCATS Traffic Data, collected by RMS 31/5/17

### 4.3. On site parking and vehicular site access

The site of the proposed Pitt Street North OSD project is currently a construction site for the Metro project with previous structures on the site demolished.

Prior to demolition, between 160-170 on site parking and service bay spaces were provided at the 175 Castlereagh Street portion of the site. It is understood that these onsite spaces were generally utilised for employee parking along with mail delivery vehicles associated with the former Australia Post office at 175 Castlereagh Street site.

Traffic generation surveys for the previous site land uses were not undertaken prior to the vacation and demolition of buildings on the site.

However assuming that all spaces were office staff space and using MS traffic generating guidelines<sup>1</sup> it is expected that the previous on-site parking provisions would have generated a peak in the order of 50-60 vehicle movements per hour in the weekday PM and AM peak periods respectively. This corresponds to a traffic generation of between 0.28 – 0.35 vehicle movements per peak hour period.

The traffic generation of the site's previous uses would have potentially been higher with a greater proportion of the previous on site parking spaces being used for mail service / delivery vehicle movements to and from the site.

The previous on site spaces were accessed via a combined entry / exit driveway located at Castlereagh Street, approximately 25 metres from the Park Street intersection.

It is noted that no other car parking (or service bays) were provided on site for the other previous uses of the site. The majority of the uses would have generated walk up or passing pedestrian trade and hence peak AM and PM period car movements would have been limited. However, the previous site uses including the fast food and other restaurant uses, retail, public hotel, and medical centre would have generated demand for service vehicle movements. These were accommodated using the surrounding on street loading zones (see Section 4.6).

The previous driveway is currently in use as an access for the Metro construction site. During demolition, construction activities on the site were understood to generate in the order of 10 construction vehicles per hour during peak periods.

Several privately-operated underground car parks are located within the area including:

- Stockland Piccadilly, 137 Castlereagh Street (274 spaces)
- Citigroup Centre, 271 Pitt Street (250 spaces)
- Hilton Hotel, 259 Pitt Street (unknown number of spaces)

#### 4.4. On-street parking

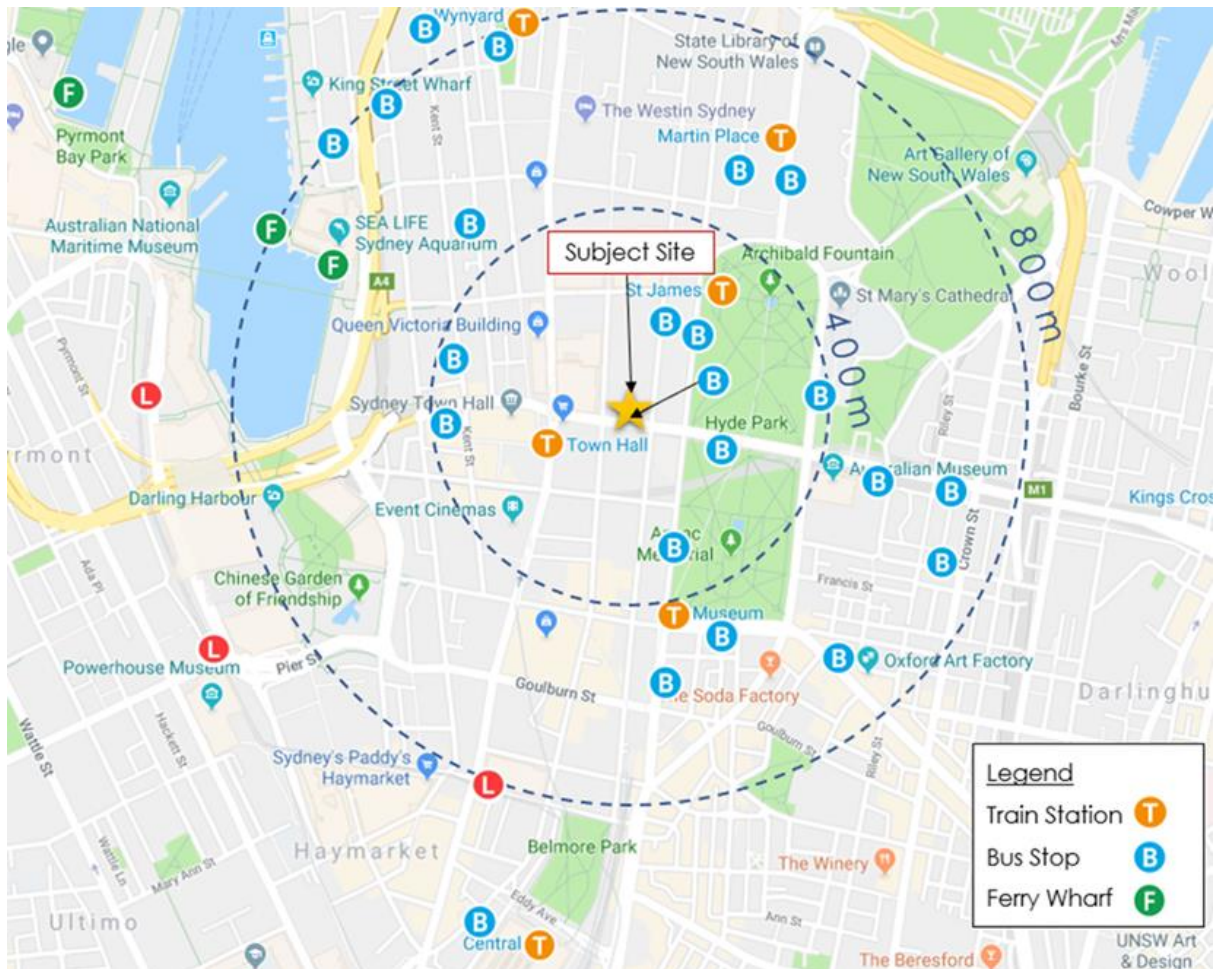
Restricted on-street parking is available on the streets surrounding the site including Pitt Street and Castlereagh Street. There is a combination of Taxi Zones, No Stopping, No Parking and Bus Zones which exist on Market Street and Park Street. Some of the latter restrictions are also present, to a minor degree, on Pitt Street and Castlereagh Street.

#### 4.5. Public transport network

The site is surrounded by an abundance of public transport options as reflected by their high usage as a travel mode by commuters (80% of all modes in 2016). Accessibility to a range of nearby public transport is illustrated in **Figure 16**.

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<sup>1</sup> RMS TDT 2013/04a Guide to Traffic Generating Developments Updated Traffic Surveys & Trip Generation and Parking Generations Surveys Office Blocks – Data Report (GTA, 2010)



**Figure 16:** Pitt Street North OSD Site Access to Existing Public Transport Services

#### 4.5.1. Train services

As described in Section 4.1, ‘train’ is dominant mode of travel for employees in the Sydney CBD. Furthermore, train mode of travel is an important mode for Sydney residents travelling to work.

The site has good accessibility to existing train services which will be significantly improved with the construction of a new Metro station below the OSD development. Good access to train services will maintain if not increase the potential mode share for train services.

The site is Town Hall Station is located approximate 180 metres from the site. Eight railway lines operate via this station. St James Station and Museum Station are also situated within a five-minute walk of the site. A summary of the existing rail services available in the area are shown in **Table 2**.

**Table 2: Rail Services**

Route	Route Description	Frequency Weekday (Peak / Off Peak)	Frequency Weekend (Peak / Off Peak)
T1 North Shore Line & Northern Line	Berowra to City via Gordon	5-15 min/ 30 min	15 min
T1 Northern Line	Hornsby to City via Macquarie University	15 min/ 15 min	15 min
T1 Western Line	Emu Plains or Richmond to City	15-20 min/ 30 min	30 min
T2 Inner West & Leppington Line	Parramatta or Leppington to City	10 min/ 15 min	15 min
T3 Bankstown Line	Liverpool or Lidcombe to City via Bankstown	10-15 min/ 30 min	30 min
T4 Eastern Suburbs & Illawarra Line	Waterfall or Cronulla to Bondi Junction	20 min/ 30 min	30 min
T8 Airport & South Line	Macarthur to City via Airport or Sydenham	10-15 min/ 30 min	15 min
Central Coast & Newcastle Line	Newcastle Interchange to Central via Strathfield or Gordon	10-50 min/ Hourly	Hourly

Source: <https://transportnsw.info/routes/train>

#### 4.5.2. Buses

Like train services, bus trips represent a significant proportion of the mode of travel for the journey to work of Sydney residents and those coming to the CBD to work. The site is located with good access to existing bus services which will continue to service existing passenger and future passengers generated by the Metro Station (interchange) and the Indicative OSD development.

Several bus stops are located within close proximity to the site and are serviced by high-frequency Metro services as well as regular services to destinations within and beyond the CBD. Park Street Stand G is located along the site frontage (northern side) while Park Street Stand K is located on the opposite side of Park Street (southern side). These bus stops are expected to remain in operation in the future.

A summary of the services operating at these bus stops, valid from 16 April 2018, is given in **Table 3**.

**Table 3: Bus Services**

Route	Route Description	Proximity of Bus Stop to OSD Site	Frequency Weekday (Peak / Off Peak)	Frequency Weekend (Peak / Off Peak)
M10*	Maroubra Junction to Leichhardt via City	Opposite Site (Town Hall Station Park St, Stand K)	10-15 min	20 min
M20	Botany to Gore Hill			
M30	Sydenham to Taronga Zoo			
M40	Bondi Junction to Chatswood			
M50	Coogee to Drummoyne			
M52	Parramatta - City Circular Quay			
311	Millers Point to Central Railway Square via Darlinghurst & Potts Point	Outside Site (Town Hall Station Park St, Stand G)	15 min / 30 min	30 min
324	Watsons Bay to Walsh Bay via Old South Head Rd		15 min / 30 min	30 min
325	Watsons Bay to Walsh Bay via Vaucluse Rd		15 min/ 30 min	30 min
500	Ryde to City Circular Quay	Opposite Site (Town Hall Station Park St, Stand K)	1-4 services	4 services
502	Five Dock to City Town Hall		15-20 min	No service
504	Chiswick to City Domain		5-30 min/ 30min	30 min
505	Woolwich to City Town Hall		8 services	No service
506	Macquarie University to City Domain via East Ryde		30 min / 30min	30 min
507	Macquarie University to City Domain via Putney		30 min / Hourly	Hourly
508	Drummoyne to City Town Hall		1-4 services	No service
510	Ryde to City Town Hall		5-9 services	No service
515	Eastwood to City Circular Quay		30 min/ 30 min	30 min
518	Macquarie University to City Circular Quay		3 services/ 30min	30 min

Route	Route Description	Proximity of Bus Stop to OSD Site	Frequency Weekday (Peak / Off Peak)	Frequency Weekend (Peak / Off Peak)
520	Parramatta to City Circular Quay via West Ryde		No services/ 30 min	30 min
L37	Haberfield to City Town Hall		4-5 services	No service

Source: <https://transportnsw.info/routes/bus>

### 4.5.3. Light rail

The Inner West Light Rail currently operates between Dulwich Hill and Central. Capitol Square Light Rail stop is the nearest stop located 900 metres from the site. The service frequency is every eight minutes during the weekday peak, 10 minutes during weekday off-peak and 15 minutes on Saturdays.

The CBD and South East Light Rail is currently under construction and when complete will connect passengers from Circular Quay through to Randwick and Kingsford on a reliable and higher capacity service.

The 12km route will feature 19 stops, extending from Circular Quay along George Street to Central Station, through Surry Hills to Moore Park precinct which includes Sydney Cricket Ground and Allianz Stadium. After this it will travel to Kensington and Kingsford via Anzac Parade, Alison Road and High Street to Randwick, taking in the race course, the University of NSW, and the Prince of Wales Hospital.

With new Light Rail stations at Town Hall and the Queen Victoria Building, the CBD and South East Light Rail will provide additional public transport options to future occupants of the Pitt Street North OSD site.

### 4.5.4. Ferries

The Barangaroo Ferry Wharf is situated some 1.2 kilometres to the west of the Pitt Street North OSD site. While the Barangaroo Ferry Wharf is within walking distance of the site, Barangaroo will have a Metro Station with a connection to the new CBD Metro line to stations including Pitt Street.

Like the light rail, the new CBD Metro line with its connections to ferry services, will enhance the public transport accessibility of the site.

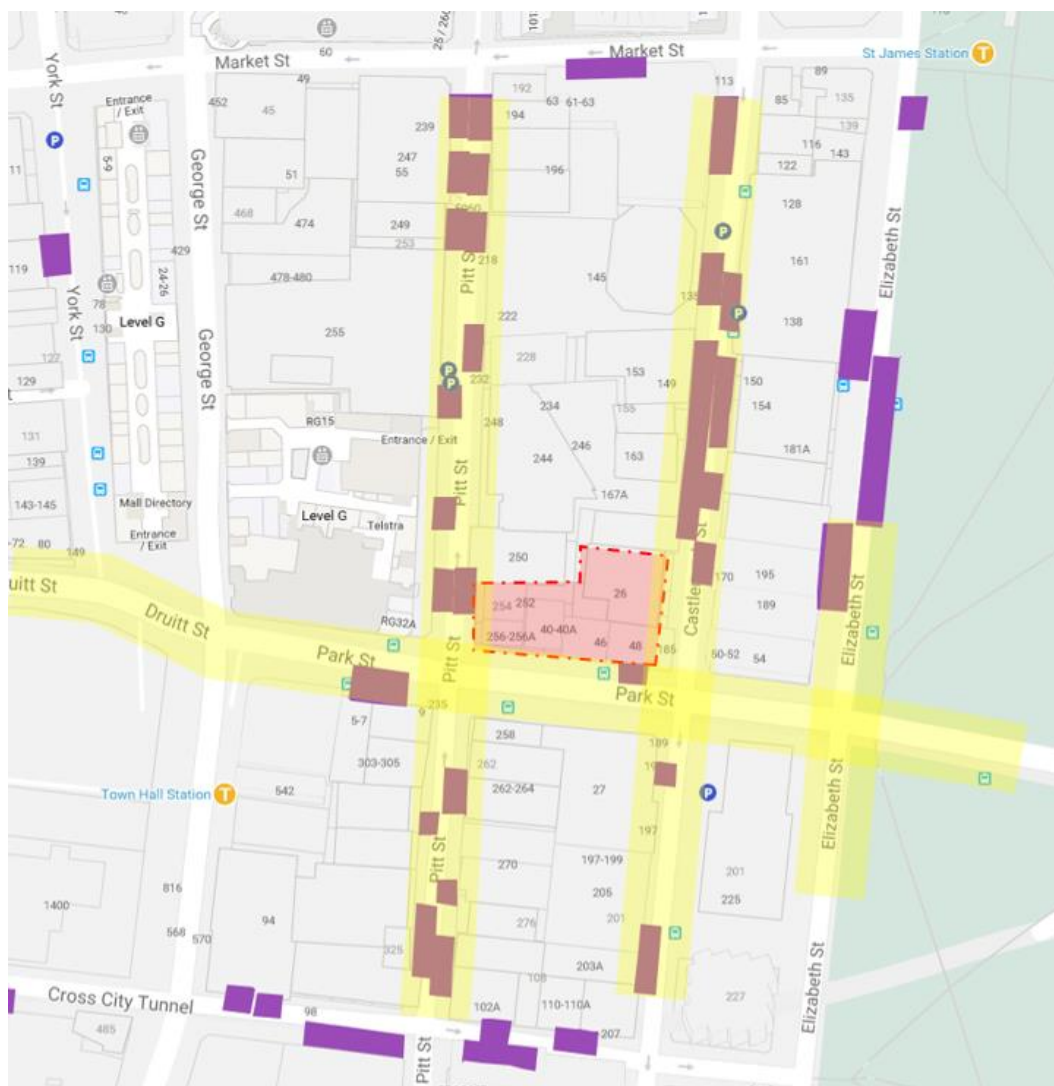


## 4.6. On-street loading zones

There are numerous nearby on-street loading zones within a 200-metre walking distance to the subject site. The start and end times of the loading zone restrictions vary across locations. However, the duration that a driver (who is permitted to stop in a loading zone) cannot exceed within any of these loading zones is 30 minutes.

The existing on street loading zone would have been utilised by the previous uses of the site.

A map showing existing on-street loading zones within a 200m-walking distance to the subject site is given in **Figure 17**.



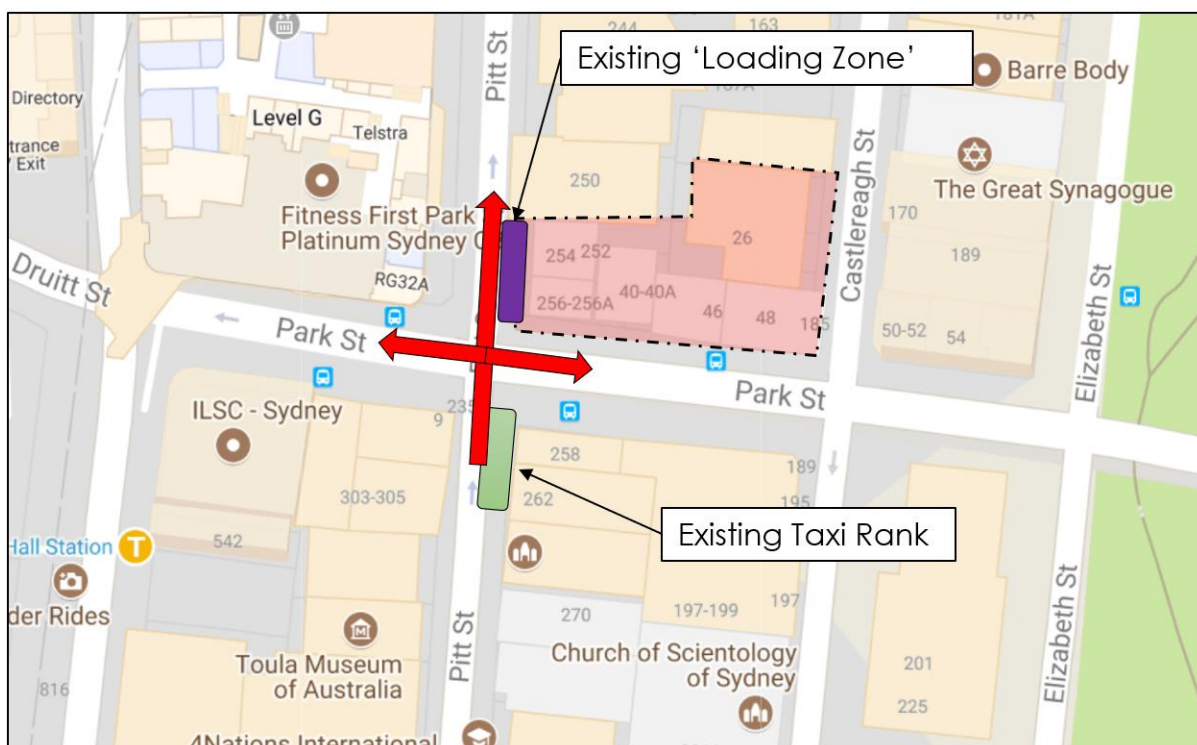
**Figure 17: On Street Loading Zones**  
 Basemap source: Transport for NSW

## 4.7. Taxi zones

An existing taxi zone is located within close proximity to the site. The taxi zone is located on the eastern side of Pitt Street, south of the Park Street / Pitt Street intersection. It is located approximately 30 metres south of the site and has capacity for around five vehicles and operates as a full-time taxi zone.

On the site's frontage to Pitt Street, there is an existing 'Loading Zone' with capacity for three vehicles which operates between 6am-6pm Monday to Fridays and 6am – 10am on Saturdays. Outside of these hours general car parking is permitted.

The location of the taxi zone and loading zone with respect to the subject site is shown in **Figure 18**.



**Figure 18:** Existing Taxi Zone and No Parking Zone

Basemap source: Google Maps

Taxi demands were surveyed on a weekday at two nearby hotels; namely QT Hotel and Swissotel on Market Street. Both these hotels are considered to have similar operational characteristics as the proposed hotel use within the Pitt Street North OSD development.

Both the surveyed hotels are located in the central CBD, have greater commercial target market compared to tourist market and are located away from Circular Quay and other major tourist attractions. This tends to increase demand for taxis whether or not people are staying at the hotel.

Taxi demands generated by the surveyed hotels (arrivals and departures) are summarised in **Table 4**.



**Table 4: Surveyed Taxi Demand for Hotel Drop Off / Pick Up Facilities (Taxi Trips / Hour)**

Peak Period	QT Hotel (200 rooms)		Swissotel (370 rooms)	
	Guest Trips	Non Guest Trips	Guest Trips	Non Guest Trips
AM Peak (8.15am-9.15am)	7	8	12	1
PM Peak (4.45pm-5.45pm)	3	5	14	23

Source: TTPP Surveys (March 2018)

## 4.8. Coach parking

Information provided online by City of Sydney indicates there are two coach parking zones located within the vicinity of the subject site.

One coach parking zone is located on the eastern side of Castlereagh Street approximately 100 metres north of the subject site while the other is located the same distance away on the western side of Pitt Street.

The locations of the coach parking zones are indicated in **Figure 19**.

It is understood that the local hotels, including Sheraton on the Park, QT Hotel and Swissotel, currently utilise the coach parking zone on Castlereagh Street (see **Figure 20**) for its guest drop off and pick ups.

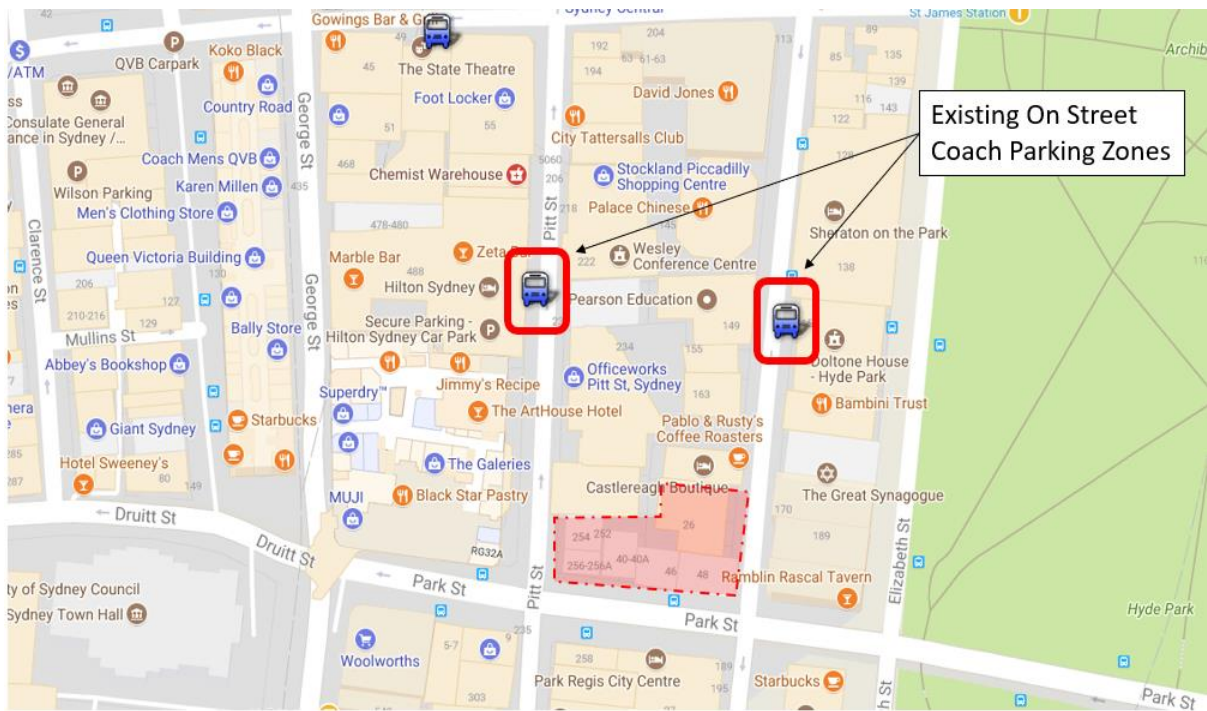
As documented in the Central Sydney On Street Parking Policy (November 2017), the City of Sydney states that:

*“There is intense competition for use of kerbside space in central Sydney. The City’s narrow streets and short east-west blocks limit the useable kerb space that can be safely allocated to support the City’s commercial and transport functions.”*

In recognition of the pressures listed above, the City of Sydney parking policy seeks to establish priorities for different types of kerb uses. One of the objectives of the policy is to provide short term coach parking for group pick up and drop off near to major destinations or accommodation and thereby supporting the City’s commercial and transport functions.

Authorised Vehicle Zones such as those in Pitt Street and Castlereagh Street are provided to facilitate bus, coach and mini-bus drop-off and pick-up near to major destinations or accommodation. The policy is set to encourage turnover of on-street coach parking and use of off-street facilities for long-stay coach layover. Long-stay coach lay-over in central Sydney will not be accommodated on-street.

The provision of short stay coach parking areas for the drop off and pick up of passengers is suited to the potential uses of a hotel development with the Pitt Street North OSD development.



**Figure 19: Pitt Street and Castlereagh Street On Street Coach Parking Zones**  
 Basemap source: City of Sydney



**Figure 20: Castlereagh Street – Existing Coach Parking Area**



**Figure 21:** Pitt Street Coach Parking Zones

#### 4.9. Pedestrian access

Previous development in the CBD Sydney has resulted in the Sydney CBD experiencing high pedestrian density levels and demand. During peak periods, the CBD’s pedestrian crossings of the road network can become congested, which is driven partly by the demand for limited space by all road uses and by outdated designs and treatments that don’t offer the priority and spatial allocation for pedestrians.

City of Sydney Council and Transport for NSW are currently developing planning strategies that will help prioritise movement and allocate sufficient space to support the current and planned levels of growth in the CBD. This will help to support place making activities that should support the economy of the CBD.

Most notably in the CBD, the current construction of the CBD Light Rail and pedestrianisation of George Street will deliver a significant shift in the priority of spatial allocation towards pedestrians.

As with all the pedestrian foot paths within the vicinity of the site, significant pedestrian activity occurs along each of the site’s frontages to Pitt Street, Park Street and Castlereagh Street.

Both the signalised intersections on Park Street at Pitt Street and Castlereagh Street have designated marked signalised pedestrian crossings on all intersection approaches.

It is anticipated that with the ongoing implementation of the Sydney City Centre Access Strategy (TfNSW, 2013) and the future operation of a new Sydney Metro station there is likely to be growth in demand for bus services at Park Street and associated pedestrian activity on the Park Street footpath.



#### 4.10. Cycling network

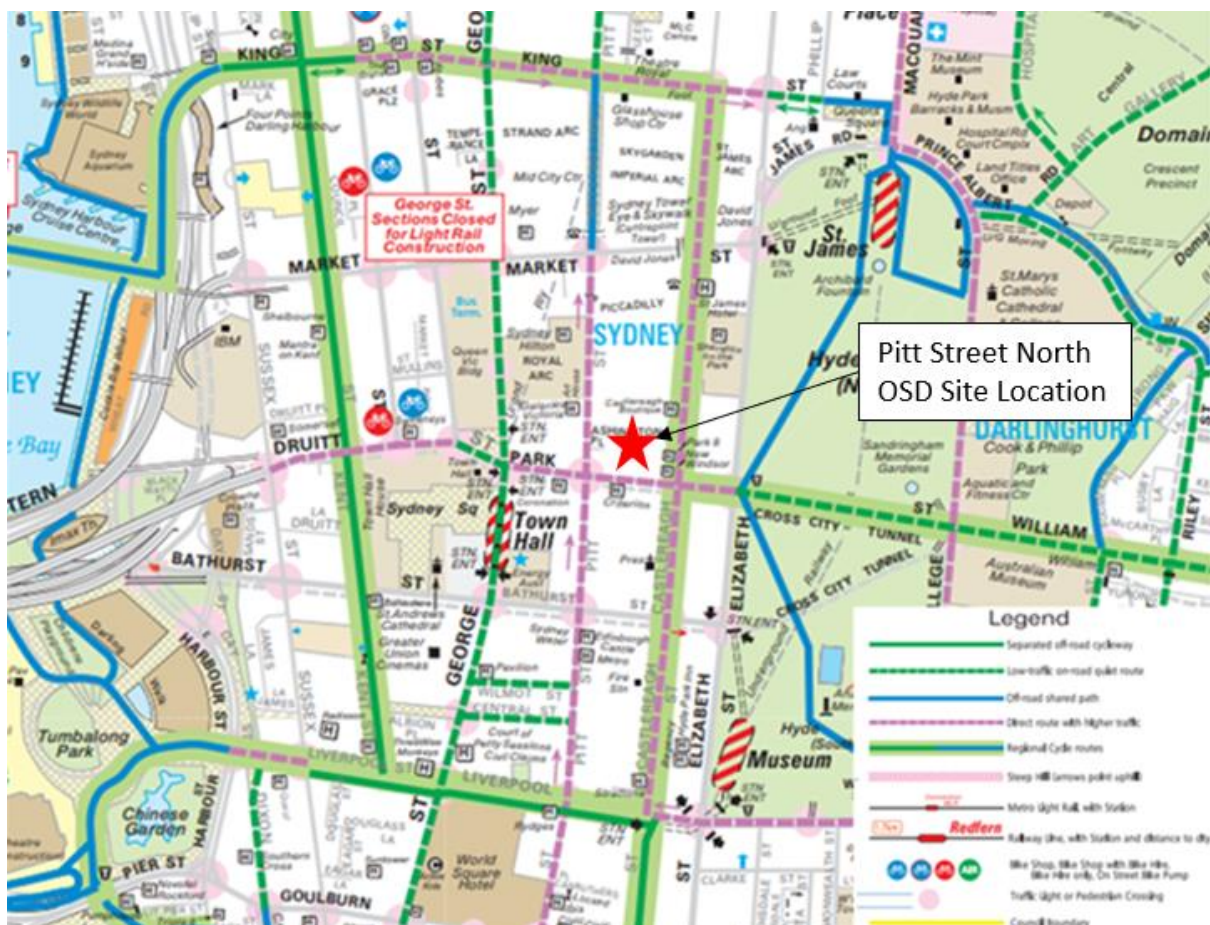
Cycling routes surrounding the site include separated off-road cycle ways, off-road shared paths and on-road routes. It is noted that George Street sections are currently closed for Light Rail construction.

City of Sydney's Cycleway map in **Figure 22** shows the available cycle routes near the site.

The NSW government's Sydney City Centre Access Strategy identifies city centre cycleways as one transport solution for keeping people moving.

The strategy identified a north-south separated cycleway between Central and Circular Quay running along Castlereagh Street to King street then down Pitt Street. The Castlereagh Street south cycleway opened in September 2015 and connects Central (Hay Street) to Liverpool Street. The northern section of the proposed cycleway has been deferred to after light rail construction.

Thus, it is proposed that a separated cycleway will be constructed along Castlereagh Street at the site's frontage. This will provide residents, employees and visitors to the Pitt Street North OSD with another improved option for travel which is not dependent upon private motor vehicle modes.



**Figure 22:** Surrounding Cycleways  
 Source: City of Sydney Cycleway Maps

## 5. Servicing and parking provision review

### 5.1. Description

The Indicative OSD Design proposes a development with a total gross floor area (GFA) of approximately 48,351m<sup>2</sup> accommodating residential, commercial and visitor accommodation (hotel) land uses.

As indicated in Section 1 of this report, the Indicative OSD Design floor area is part of the total GFA for the integrated station development which includes the station GFA (i.e. retail, station circulation and associated facilities) and the OSD GFA.

For the purposes of understanding the likely parking and traffic generation rates from the integrated station development (i.e. as a result of the total development of the site), the parking demand and traffic generation associated with the integrated station development has been considered in this assessment. This approach will ensure that an adequate level of infrastructure is provided to support the concept proposal and future detailed SSD application.

### 5.2. Car parking provisions

The development would provide an appropriate number of car parking spaces in accordance with the Sydney LEP 2012. The LEP encourages developments to have a lower parking supply if there is good access to public transport services, and on this basis provides a maximum parking rate for each type of land use with no minimum parking requirement.

A total of up to 55 on site parking spaces will be provided within the podium levels of the Pitt Street North OSD development.

Of these 55 spaces, 54 spaces would be allocated to the OSD and 1 space allocated to the Metro Station as a service bay.

The indicative allocation of the 54 OSD parking spaces would be as follows:

- 49 resident car parking spaces
- 1 car share space
- 4 maintenance / service vehicle spaces

As discussed in Section 1, the Concept SSD application for the Pitt Street North OSD building envelope would indicatively provide a total of approximately 300 residential apartments. It is noted that the potential traffic generation potential of the Concept SSD is assessed based on the number of parking spaces provided rather than the number of residential apartments. Thus, variations to the apartment yield or apartment mix would not change the findings of the traffic assessment of the proposal.

An indicative mix of apartments is expected to be:

- 129 x 1 bedroom
- 140 x 2 bedroom
- 35 x 3 bedroom and one penthouse

application of LEP 2012 parking rates to the above residential yields would allow a maximum provision of 176 parking spaces for the residential component of the Concept SSD.

The proposed on site parking provisions for each proposed land use within the OSD are compared with the LEP 2012 maximum allowances in **Table 5**.

**Table 5: Car Parking Space Provisions**

Land Use	Proposed Car Parking Provision	Sydney LEP 2012 Maximum Allowable Car Parking Spaces
Residential (304 apartments)	49 + 1 car share	176
Hotel (198 rooms)	0	65
Commercial (1,482m <sup>2</sup> )	0	2
<b>TOTAL</b>	<b>50</b>	<b>243</b>

*Note: Residential Allocation includes 1 car share space*

For a provision of 49 residential car parking spaces, LEP 2012 would require a provision of 1 car share space. The allocation of 1 space for car share / service vehicle bays would more than adequately accommodate the LEP requirements.

For both the proposed commercial and hotel uses the LEP 2012 sets maximum parking allowances and no minimum requirements. Thus, the provision of no parking for commercial or hotel uses is compliant with the LEP.

### 5.3. Bicycle parking

On site bicycle and motorcycle parking facilities are required under LEP 2012 for each of the proposed uses within the OSD proposal.

The Indicative OSD design indicates a bicycle parking provision of 304 on site bicycle spaces and 51 external (publicly accessible) spaces.



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## 5.4. Loading dock and service vehicles

### 5.4.1. Loading provisions

The OSD proposal will provide a total of 4 on site service vehicle spaces on the ground floor accessed via the Castlereagh Street driveway.

The 4 service spaces at the ground floor would accommodate the following:

- 2 x Small rigid vehicles
- 2 x Medium Rigid vehicles

Access to the ground floor service vehicle bays would be assisted by a vehicle turntable, which as shown in the vehicle swept path analysis provided in Appendix A would allow all 4 spaces to be accessed and occupied independently of each other if required.

In addition, the ground floor spaces, maintenance van parking spaces (4 spaces) would be provided within the podium parking area accessed and via the car lift.

The capacity of the proposed loading dock facility will be influenced by several factors, the keys ones of which are:

- Number of service vehicle spaces that can be used at any one time
- Dwell time of service vehicles in the dock
- Number of service vehicles accessing the dock
- Type of service vehicles accessing the dock

These factors have been considered in the assessment of the proposed loading dock and service vehicle facilities as discussed below.

### 5.4.2. Loading dock requirements

It is acknowledged that the Sydney DCP 2012 is not applicable to State Significant Development (SSD).

Notwithstanding the above the Sydney DCP 2012 seeks to have developments manage their transport demands by encouraging more sustainable transport options. 'Managing transport demand' means minimising the need to travel, minimising the length of trips, (particularly by cars), and encouraging travel by more sustainable modes of transport.

In essence the DCP's objectives are to ensure that the site's service vehicle demand can be adequately accommodated on site and / or without adverse implications external to the site.

### 5.4.3. Loading dock demands for residential and commercial uses

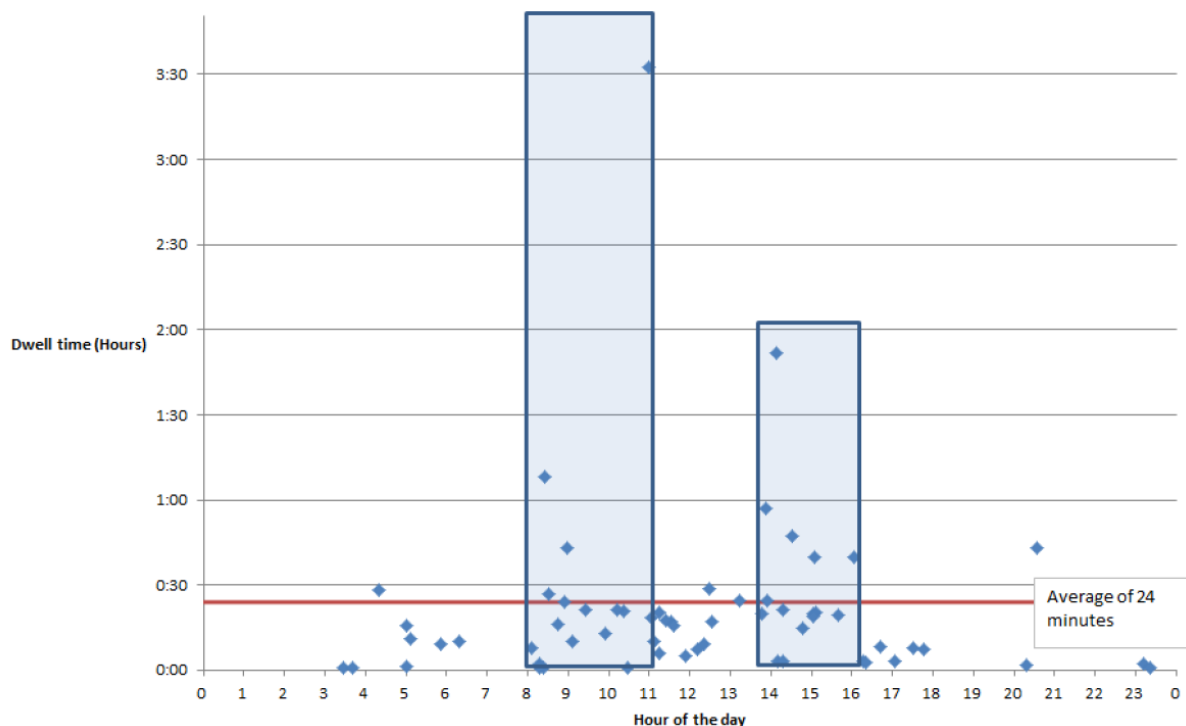
With regard to service vehicle demands, TfNSW – Sydney Coordination Office Planning and Freight has undertaken a quantitative study and assessment of the likely service vehicle demands for the Pitt Street North OSD loading facilities <sup>2</sup>.

The assessment which was based on surveys of numerous CBD loading docks identified that the daily demands for residential service vehicles was generated by the following types:

- Parcel / mail deliveries: 36 %
- Food / drink deliveries: 19 %
- Removalist / bulky items deliveries: 9 %
- Trade or maintenance vehicles : 25 %
- Waste removal: 7 %
- Unknown: 3 %

Dwell times of service vehicles within residential docks varied significantly by less than a minute up to 11 hours and 15 minutes.

The average dwell time of service vehicles was identified to be about 24 minutes (see **Figure 23**).



**Figure 23:** Delivery Profile and Average Dwell Time

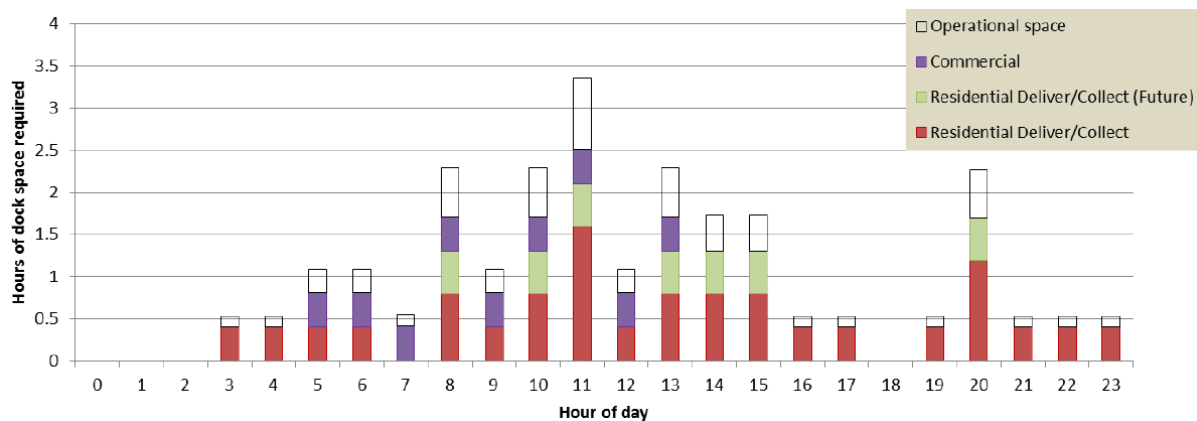
Source: Pitt Street North Dock Activity Assessment – Draft V#2.0 (TfNSW, SCO Planning and Freight) 9 April 2018

<sup>2</sup> Pitt Street North Dock Activity Assessment – Draft V#2.0 (TfNSW, SCO Planning and Freight) 9 April 2018.

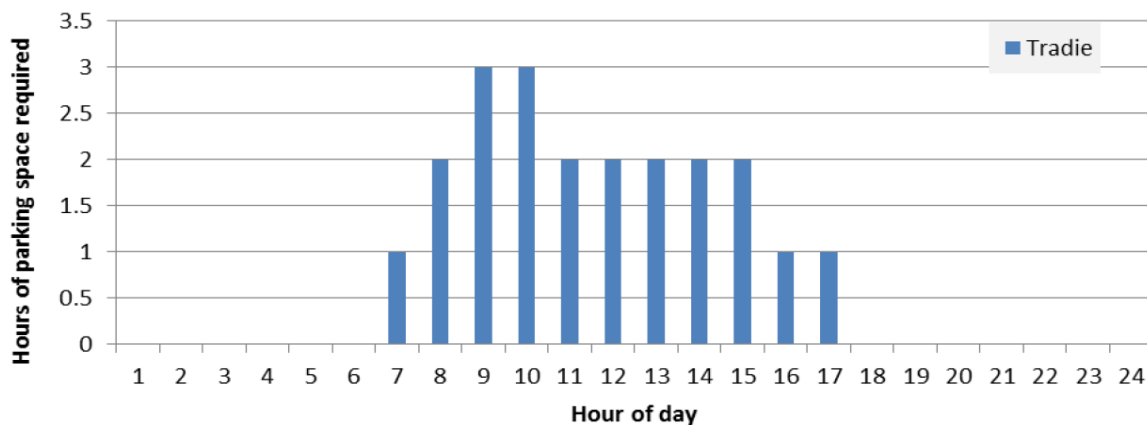
The dwell time of trades and maintenance vehicles parking on site all day tended to skew the average dwell time. The ability to separate service vehicle spaces for trades and maintenance vehicles from the general loading dock will provide opportunities to achieve improved efficiency and dock capacity. That is, vehicles with extended dwell times do not take up capacity within the loading dock allowing higher turnover of service vehicle spaces.

The surveys indicated that only 37% of residential deliveries in the CBD were recorded as being completed via the loading dock. The majority of deliveries occurred on street via on street loading zones.

The application of the loading dock profiles for residential and commercial uses (note: excludes hotel demands) to the Pitt Street North OSD project has been assessed to result in the dock demand profiles shown in **Figure 24** and **Figure 25**.



**Figure 24:** Hours of Dock Activity to Support Pitt Street North OSD – Residential & Commercial  
 Source: Pitt Street North Dock Activity Assessment – Draft V#2.0 (TfNSW, SCO Planning and Freight) 9 April 2018



**Figure 25:** Trades and Maintenance Parking Requirements (long dwell time)  
 Source: Pitt Street North Dock Activity Assessment – Draft V#2.0 (TfNSW, SCO Planning and Freight) 9 April 2018

The dock demand profile shown in **Figure 24** indicates that residential and commercial demands would vary from 0-3 vehicles at any one time. With some allowance for future operation demand a peak demand for 3.5 spaces would be accommodated within the proposed 4 space loading bay.

**Figure 24** also indicates a profile with defined peaks and thus the ability to manage the demands of hotel service vehicle access will be an important factor in the capacity of the dock to accommodate peak demand of all OSD uses.

**Figure 25** indicates that a provision of 4 service vehicle spaces within the podium car parking area would accommodate the demands of trades and maintenance vehicles which can stay on site for extent periods of time.

Thus, the separate provision means that dock capacity at the ground level is not adversely affected by trade vehicles with extended dwell times.

It is noted that the service vehicle bays within the podium would have a minimum headroom clearance of 2.4m and would thus be appropriate for use by utilities and vans.

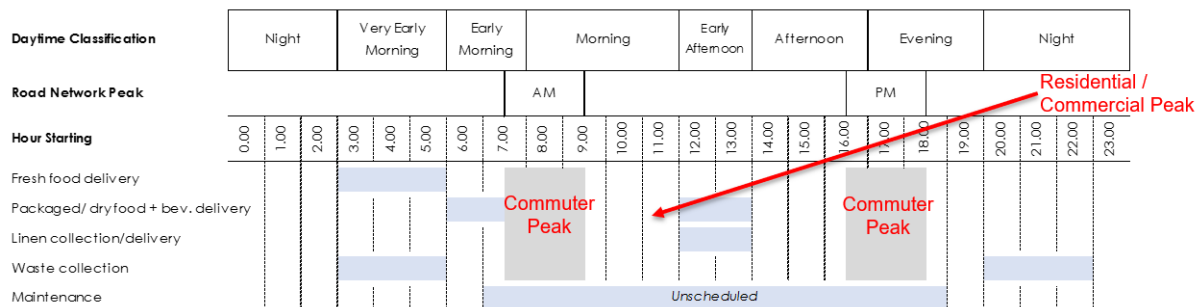
#### 5.4.4. Loading dock demand for hotel uses

Deliveries to and from hotel uses can, to a large extent, be planned to occur at specific times. It is expected that all hotel deliveries would be controlled under supply contracts so delivery times can be assigned with an estimated 75% reliability on delivery times. Most food deliveries occur in the early morning, with laundry occurring predominately around midday and garbage collection at night.

As such hotel deliveries can be scheduled to occur outside of the peak commuter periods and also avoid peak loading times for other site uses.

For the proposed hotel on the Pitt Street North OSD site, it is estimated that there would be approximately 20-25 deliveries per day<sup>3</sup>, generally in vans and small rigid vehicles.

A profile of anticipated hotel deliveries is shown in **Figure 26**.



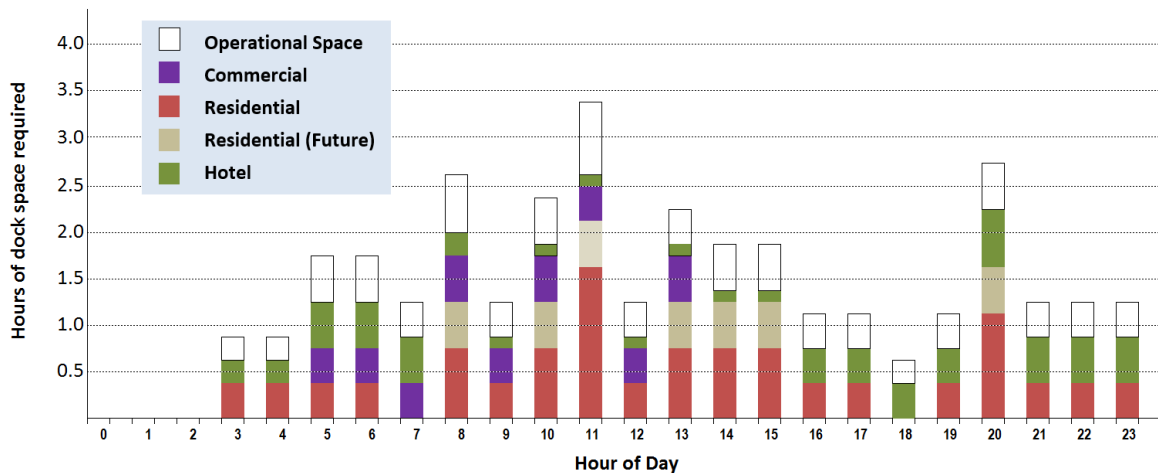
**Figure 26:** Hotel Dock Activity

Source: Creative Project Direction Pty Ltd, 'Planning Support Report for Proposed Hotel OSD Pitt Street North, Sydney'

<sup>3</sup> Source: Creative Project Direction Pty Ltd, 'Planning Support Report for Proposed Hotel OSD Pitt Street North, Sydney'

### 5.4.5. Combined residential, commercial and hotel loading dock demand profile

Based on the above survey and estimated dock demands for the various proposed OSD uses, a combined loading dock demand profile has been developed for the Pitt Street North OSD project (see **Figure 27**).



**Figure 27:** Combined OSD Proposal Uses – Loading Dock Demand Profile

**Figure 27** indicates that the OSD proposal will generate a peak demand of approximately 3.5 vehicles for the on site loading dock for a duration of one hour.

The proposed provision of 4 service vehicle bays within the ground floor loading dock has the capacity to accommodate the potential demands of the overall OSD development including projected future residential demand.

There is potential scope to reduce these average service vehicle dwell times through the application of the delivery service plan principles, which would mean each space could accommodate more service vehicles per hour. This is addressed below.

### 5.4.6. Managing loading dock demand for Pitt Street North OSD

The assessment of loading dock capacity presented above indicates that the proposed provision can accommodate potential demands wholly within the OSD site.

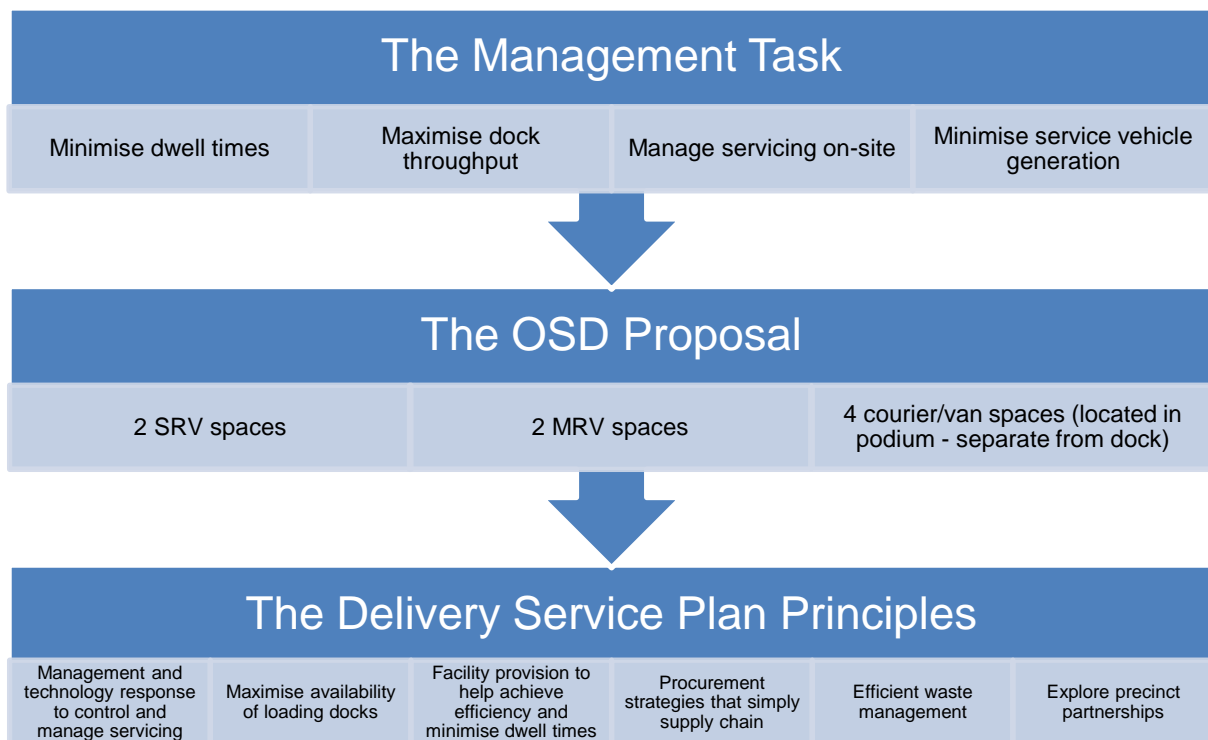
It is noted that the TfNSW assessment of loading dock capacity was based on actual survey of dock activity of largely unmanaged docks. There is an opportunity reduce usage peaks and minimise dwell time in the dock with active dock management and well located materials storage facilities inside the building

Successful management of servicing and delivery activities generated by the OSD development will rely on maximising the efficient use of the available loading dock facilities.

This will be achieved by:

- Minimising servicing space dwell times
- Maximising throughput of goods and vehicles through the loading dock
- Accommodating loading and servicing entirely within the confines of the property
- Minimising service vehicle generation to the building.

The strategy for the implementation of the loading dock management task is set out in **Figure 28**.



**Figure 28:** Delivery Service Plan Principles

The principles and initiatives that will be adopted to manage deliveries, servicing and loading dock operation are as follows:

- Operations - Ensure that delivery and service vehicles generated by the OSD development do not impact public safety
- Operations - Ensure that delivery and service vehicles generated by the OSD development can be managed wholly within the site without impacting the external road network
- Operations - Reduce or eliminate the likelihood of service vehicles queuing to enter the loading dock or having to circulate on the road network before accessing the loading dock

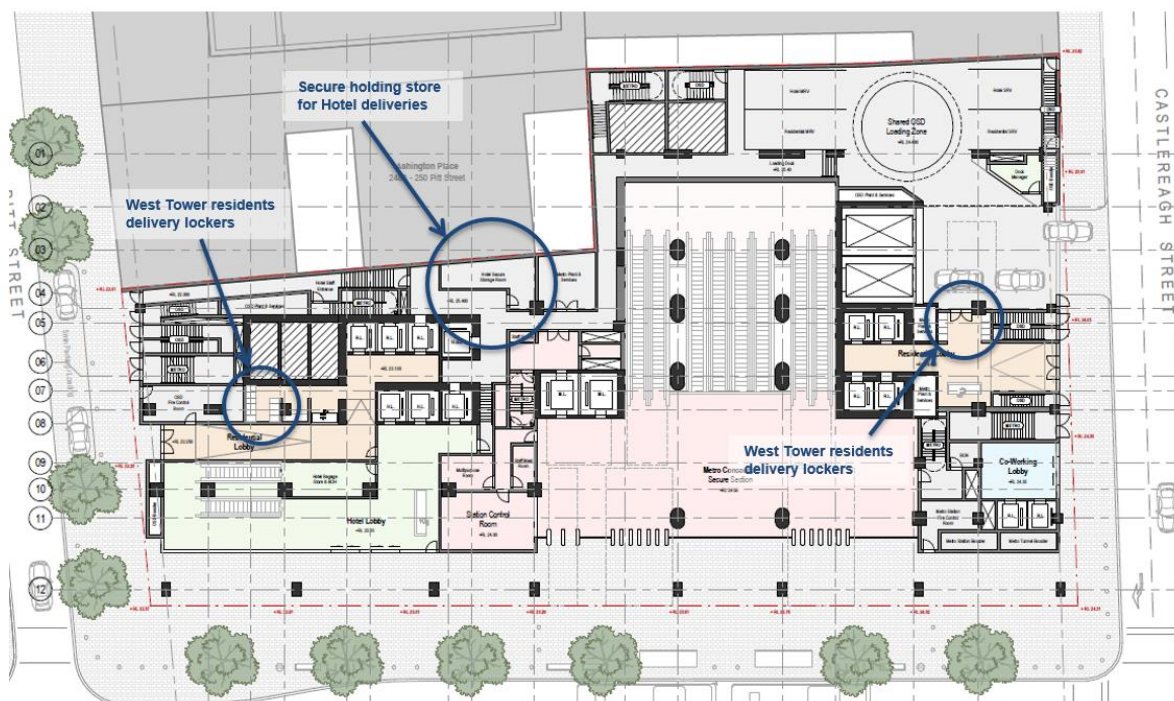


- Hours - Consider the feasibility of the loading dock operating on a 24 hour a day basis to facilitate after hours arrival and departure
- Logistics - Use delivery booking schedules to manage the arrival and departure of service vehicles to spread loading dock utilisation and avoid peak period generation
- Logistics - Use smart lockers is to facilitate minimal loading dock dwell times and maximise vehicle turnover
- Logistics - Deploy loading dock staff and/or freight concierge services to receive deliveries at the loading dock on behalf of tenants to minimise dwell times and improve peak hour turn over
- Procurement - Adopt group procurement solutions to reduce the likelihood of multiple suppliers providing the same product or service via numerous orders and vehicle movements
- Waste - Adopt a waste processing system that allows comingling of waste via tenant on site dumping and subsequent pick up by MRV
- Precinct Partnerships - Promote agreement with adjacent building operators to accept goods on behalf of Pitt Street North OSD for subsequent delivery by foot / cycle courier.

It is recommended that the following specific loading dock management measures be included in the future detail design as part of a future detailed application to reduce loading dock dwell times:

- Maintain an on site Loading Dock Manager to actively manage vehicle movements and dwell time
- Dock Manager to implement Loading Dock Management Plan (integrated for all site land uses) and include this in the formal Building Management Statement
- Provide trades and maintenance vehicles parking on car parking levels which will accommodate long stay vehicles on site. This will remove long stay trade parking from the ground floor loading dock, thereby not reducing available capacity within the dock. More capacity in the ground floor loading dock will provide dock management with more flexibility to allocate spaces to deliveries in a manner which minimises implications to vehicle access
- Provide delivery lockers for residents within easy access of the dock to avoid the need for deliveries to be made to individual apartments such as home delivery groceries & parcel post (see **Figure 29**). This will also reduce delivery vehicle dwell time on site within the loading dock

- Provide secure holding stores for the hotel near the loading dock so vehicles can unload and not have to take goods into the hotel via the lifts, thereby reducing potential vehicle dwell times within the loading dock. Examples of delivery lockers currently used by Woolworths, Coles and Australia Post are shown in **Figure 30**
- Loading Dock Management Plan will need to address:
  - Planned times for Dock Access (ie. removalists, regular deliveries)
  - External signage notifying “Dock Full – Do Not Enter”
  - Co-ordination / control of vehicles movements into and out of dock and car park lift.



**Figure 29:** Potential Locker Locations for Storage of Deliveries



**Figure 30:** Indicative Images of Delivery Storage Lockers

#### 5.4.7. Summary of loading dock assessment

Quantitative surveys of loading dock activity by TfNSW has indicated that a large proportion of deliveries within the CBD are currently not undertaken via dedicated on site loading facilities.

Thus, the proposed Pitt Street North OSD project which can provide a loading and service vehicle facility which accommodates combined site demands will represent a significant improvement when compared to previous uses of the site and other surrounding land uses.

Notwithstanding the above, it is concluded that dock management will be key to maintaining efficient and effective loading dock operations.

### 5.5. Parking compliance

The detailed design drawings will be developed as part of the future detailed SSD application. The car park and loading dock design will be developed in accordance with the following standards:

- AS/NZS 2890.1:2004 Parking Facilities – Off-street car parking
- AS 2890.2-2002 Parking Facilities – Off-street commercial vehicle facilities
- AS 2890.3:2015 Parking facilities - Bicycle parking
- AS 2890.6:2009 Parking facilities – Off-street parking for people with disabilities

## 6. Transport assessment

This section highlights the approach and assumptions that are adopted for the appraisal of road network impacts and quantifies the additional impact resulting from the proposed Indicative OSD Design concept.

### 6.1. Traffic generation and road network impacts

The forecast traffic generation has been calculated by assessing the likely cumulative traffic generation from the site based on the integrated station development and the proposed development uses with a proposed on site parking provision of up to 55 car spaces including courier / van and car share spaces.

This traffic generation estimate was then compared to estimated traffic generated by the development that previously existed on the site.

As described in Section 4, the previous site uses included provision of 160-170 parking spaces and had an estimated traffic generation of about 50-60 vehicle movements per AM and PM peak hour period.

RMS (TDT 2013/4a) guidelines contain traffic rates for high density residential apartments but not within Sydney CBD. Using the RMS Pymont site from the RMS surveys, traffic generation rates are:

- Weekday AM Peak : 0.12 vehicle movements / car parking space
- Weekday PM Peak : 0.07 vehicle movements / car parking space
- Weekend Peak : 0.13 vehicle movements / car parking space

TTPP staff have undertaken surveys of the Central Park development at Chippendale where the surveyed rates were:

- Weekday AM Peak : 0.06 vehicle movements / car parking space
- Weekday PM Peak : 0.08 vehicle movements / car parking space
- Weekend Peak : 0.09 vehicle movements / car parking space

It is considered that the Pitt Street North OSD proposal would have similar traffic generation characteristics to those surveyed by TTPP staff at Central Park.

The application of the Central Park traffic generation rates to the proposed OSD would result in the following traffic generation estimates for on site car parking spaces:

- Weekday AM Peak : 3 vehicle movements / hour
- Weekday PM Peak : 4 vehicle movements / hour
- Weekend Peak : 4 vehicle movements / hour

When combined with the expected service vehicle generation during these peaks, the total vehicle movements for the site at the Castlereagh Street driveway access would be:

- Weekday AM Peak : 9 vehicle movements / hour
- Weekday PM Peak : 7 vehicle movements / hour
- Weekend Peak : 5 vehicle movements / hour

Thus, the proposed reduction in on site car parking and service vehicle spaces from some 170 spaces to only 59 spaces would significantly reduce the traffic generation potential of the site with the OSD proposal compared to the previous site uses which generated some 50-60 vehicle movements per hour in peak periods.

As the site generated traffic volumes at peak times are expected to decrease, no adverse impacts on the broader road network are anticipated when the development is operational. Furthermore, no traffic modelling has been undertaken (as specified in the SEARs) on the basis that the proposed OSD would generate less traffic than previous site uses.

The management of traffic flows at the site access are discussed below.

## 6.2. Site vehicle access arrangements

As set out in Section 1, it is proposed to provide a combined entry / exit vehicle driveway on Castlereagh street to service the proposed on site car parking and loading dock facility.

This section of the report assesses the proposed location and implications of the proposed access arrangements and the management measures required to address potential implications associated with the interaction of the various vehicle and pedestrian activities.

### 6.2.1. Driveway location

Castlereagh Street is considered to be the only viable location for the provision of a vehicle access servicing the site. Park Street is not considered practical due to the existing and future bus stop provisions and the Metro station pedestrian access. The length of the site's frontage to Pitt Street and Metro Station spatial requirements at the ground level restrict the ability to provide a vehicle access on Pitt Street.

The proposed Castlereagh Street driveway is located as far as practical to the north along the site's frontage to maximise the distance between the Park Street intersection and the access driveway.



It is noted that the proposed driveway will be located further away from the Park Street intersection than the previous site access which serviced about 100 more parking spaces than the proposed OSD.

The straight and flat alignment of Castlereagh Street at the proposed driveway will provide appropriate sight lines between vehicles, pedestrians and cyclists. The detail design of the access as part of the future DA will need to consider the location of structures, kerbside furniture and street trees to enable the provision of AS2890 compliant sight lines.

### 6.2.2. Vehicle access management

Careful management of vehicles accessing the site via the proposed driveway is required to ensure that efficient operation is maintained, and potential impacts mitigated.

It is considered that inefficient operation could result in vehicle queuing from the site to Castlereagh Street. Vehicle queuing could potentially result from:

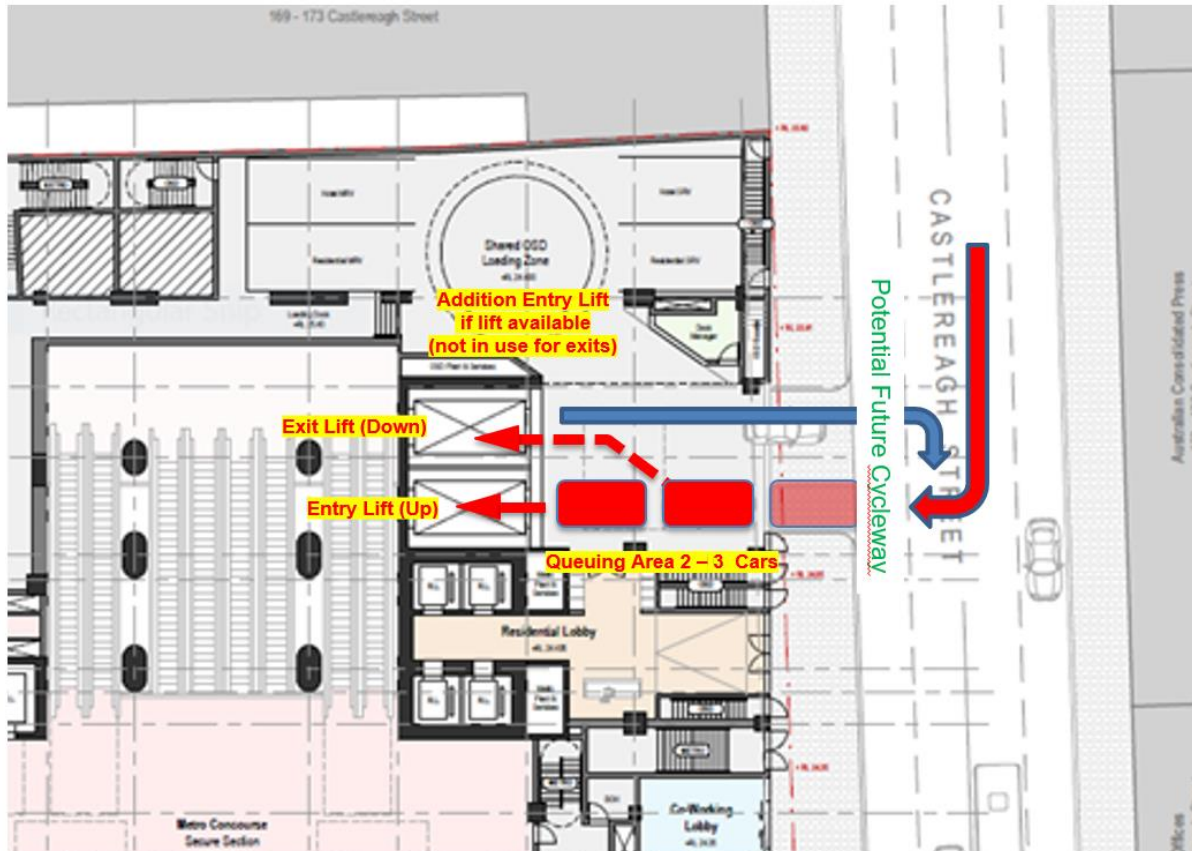
- Lack of loading dock capacity at peak times – lack of demand management
- Insufficient service rates for the car park vehicle lifts
- Lack of control of car park and loading dock traffic flows within the site.

In order to minimise the potential for vehicle queuing out of the site and cross the footpath and onto Castlereagh Street, it is recommended that the following strategy be implemented:

- Prioritise INBOUND vehicle movements over outbound movements (see **Figure 31**)
- Ensure service rate for INBOUND vehicles (ie. lift travel times) can accommodate demand without generating queues beyond the property boundary
- Reduce / restrict service vehicle access to the loading dock during the peak PM period when the residential car park inbound movements peak. This is expected to be between 5pm-7pm. Loading dock movements are expected to be low (if not non-existent at these times).

Regular maintenance of the lifts would be required to minimise the potential for lift breakdowns. Should the lifts breakdown prompt repair should be undertaken to minimise inconvenience to drivers. Any cars not parked on site if both lifts breakdown would be able to temporarily park in one of the surrounding public car parking facilities. Couriers and maintenance vans would temporarily utilise on street loading facilities. Signage at the driveway would be activated to inform drivers that the on site car park is inaccessible.





**Figure 31:** Indicative Car Park (Lift) Access Priority Arrangements

The recommended arrangements shown in Figure 31 would provide a queuing area for 2-3 cars waiting to enter the car park lifts.

For the recommended arrangements the following assumptions have been used to estimate the service rate of the car park lifts:

- Lift Travel Time: 0.8 m / second
- Floor to floor level : 3.0 m
- Worst Case Lift Run = to Level 10 (31m): 39 second
- Door opening / closing and vehicle manoeuvring: 10 second
- Cycle time of lift = 39 sec x 2 + (3 x 10 sec): 108 second
- Lift (single) service rate: 33 vehicles / hour.

The service rate would be increased with the use of both car park lifts to enter the car park assuming both lifts are vacant and available.

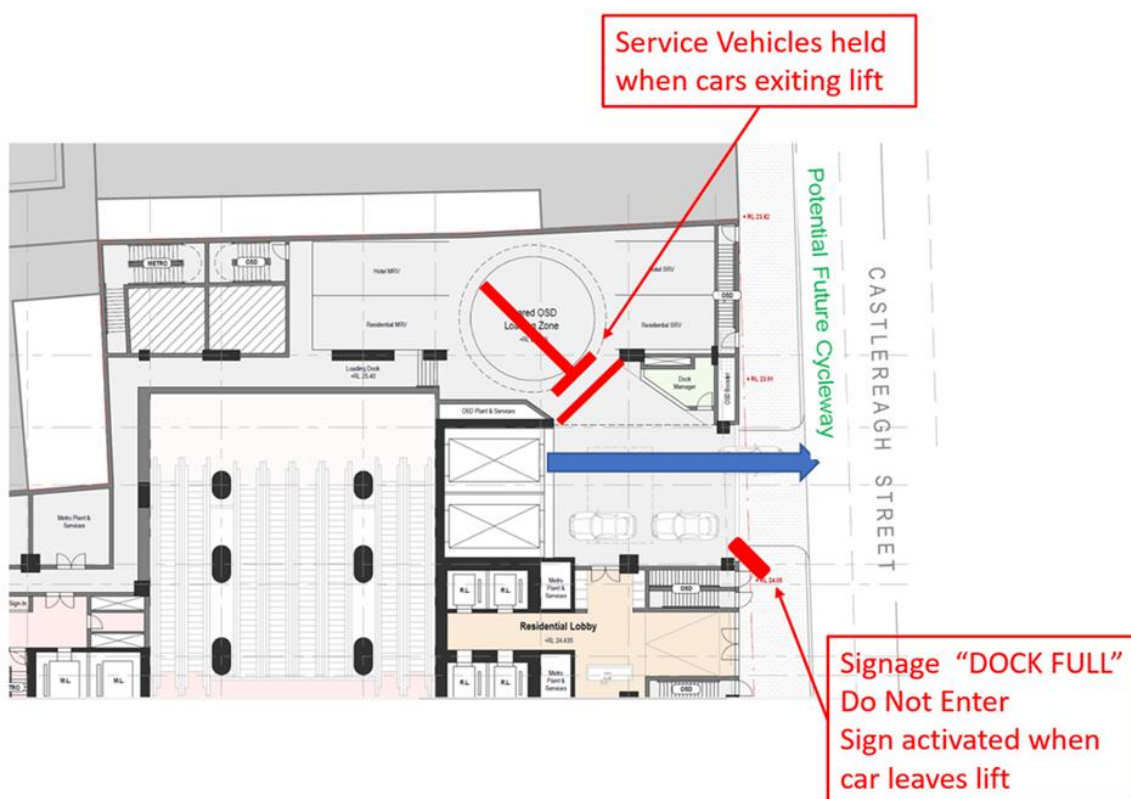
The application of queuing theory (Transportation and Traffic Engineering Handbook (ITE) p304), to assumed car lift service rate forecasts the following probabilities for the estimated demand of 5 cars arriving per hour to find:

- 0 vehicles queue = 85 %
- 1 vehicle queued = 13 %
- 2 vehicles queued = 2 %
- 3 vehicles queued = <1%
- 3+ Vehicles queued = <1%

As such it is concluded that the proposed access arrangement for the car lift are satisfactory with regard to mitigating the potential for adverse queuing implications to Castlereagh Street.

While peak period for car lift operation and peak loading dock activity are not likely to occur at the same time, it is recommended that appropriate management measures be implemented through the Loading Dock Management Plan to ensure vehicles exiting the dock do not conflict with vehicles exiting the car park. Similarly, service vehicles shall be restricted from entering the dock should the loading dock be fully occupied.

The recommended management controls are conceptually set out in **Figure 32**.



**Figure 32:** Indicative Car Park / Dock Management Measures

### 6.2.3. Vehicle access and cycle / pedestrian interaction

Detailed design of the interface between driveway access and the proposed future cycleway along the site's frontage to Castlereagh Street needs to occur in consultation with Sydney Coordination Office and Council as part of the future detailed application to ensure that appropriate safe and efficient designs are implemented.

Notwithstanding the above, the concept for the proposed OSD driveway at Castlereagh Street has been designed to :

- Minimise the potential for vehicle queuing over the footpath and the proposed cycleway;
- Provide clear sight lines for vehicles at the cycleway crossing; and
- "Flashing Light" system at vehicle access to alert pedestrians / cyclists to exiting vehicles subject to SCO endorsement and RMS approval.

### 6.3. Mode share

The mode share for the site will be influenced by both current trends and future proposed changes. Section 4 highlighted the existing journey-to-work mode share trend for workers travelling to locations near to the proposed OSD and residents living in the Sydney CBD travelling to and from work.

The data indicates that 80% of people chose to travel to work by train, with only 11% utilising private vehicle for a similar trip purpose and the remainder using active travel and other modes.

Similarly for residents living in the CBD near the site, the use of private vehicle was very low (5% of total trips) with the main mode of travel to work being 'Walk Only' (53% of trips) and public transport (37% of trips).

It is noted that good access to public transport, restricted parking provision and management together with a concentration of high density, mix of uses and accessibility to other key catchments are attributing factors to this outcome.

The introduction of Sydney Metro (Northwest and City & Southwest lines) as well as the CBD and SE Light Rail project will increase the coverage and accessible offering by public transport to and from the OSD site.

The OSD will directly benefit from the proposed Pitt Street Station due to its proximity. The Metro station, combined with the existing transport services, will provide the OSD with access to a vast public transport catchment.

No on site parking would be provided for the proposed commercial land uses of the proposed OSD thus the mode share for non-private vehicle travel is expected to be significantly higher than the broader Sydney CBD with train and bus expected to be the dominate mode of travel for employees.

Similarly, for future residents of the proposed OSD, the proposed indicative provision of 50 parking spaces (49 resident + 1 car share space) represents only 28% of the allowable on site parking under the Sydney LEP controls. Furthermore, for a development with

approximately 300 apartments, only 17% of apartments would have access to an on site parking space.

As indicated by the journey to work (2016) statistics in Section 4 of this report, residents within Sydney have a high 45% mode share for walking. With the limited on site parking provisions and central CBD location, walking as a mode of travel for residents is expected to remain the dominant mode for future OSD residents.

In summary, the combination of limited parking supply on-site (due to the OSD's compliance with the maximum parking rates prescribed by the Sydney LEP) and the site's good access to public transport and walkable destinations, it is expected that journey to work trips generated and attracted from / to the OSD would result in a mode shift towards public transport and active travel modes.

## 6.4. Public transport

As previously discussed, the OSD site is in a highly accessible location by public transport, which will be further increased through the introduction of Pitt Street Station.

On this basis, the proposed concept OSD is considered to offer high levels of public transport connectivity.

## 6.5. Cycling

The site is situated within a central location in the Sydney CBD and similar to other CBD locations is served by the city's bicycle network. The OSD site is located to take advantage of the existing and planned cycleway facilities in the CBD, most notably the existing and planned extension of the Castlereagh Street cycleway.

In order to support the promotion of cycling as a mode of access to the Sydney CBD the development proposes to provide bicycle parking and end-of-trip facilities for residential, employee and visitors as discussed in **Section 5.3** and support any proposed cycling access improved that would benefit the Sydney CBD.

## 6.6. Pedestrian impacts

Pedestrian modelling of the Metro station and OSD has been undertaken by the Sydney Metro station design team to support the Concept SSD Design development process and this application.

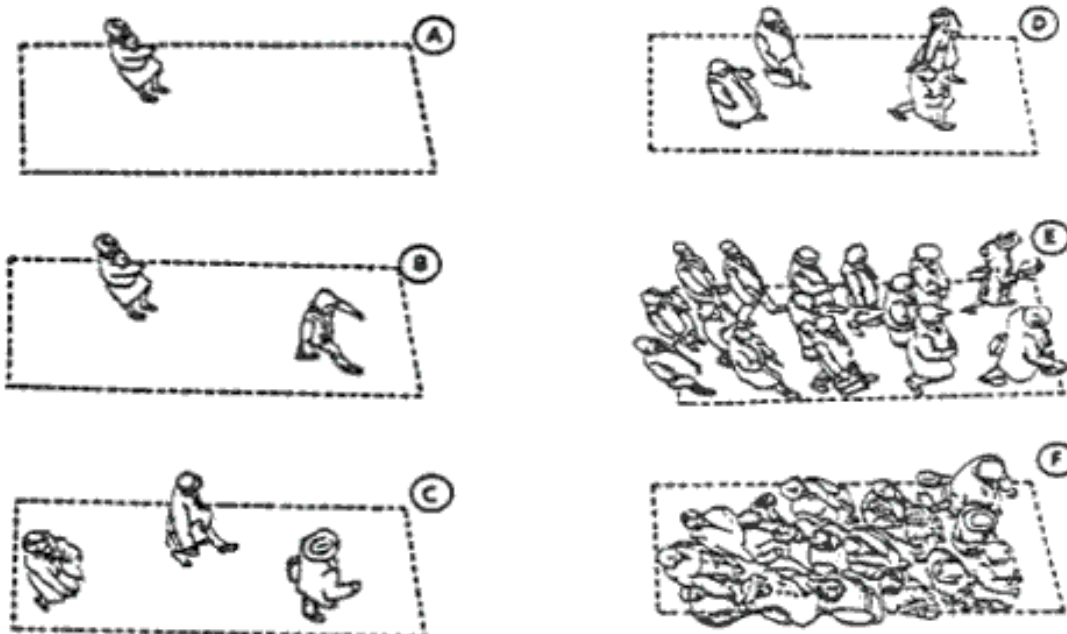
The outcome of the modelling is summarised below and was applied to the 2036 traffic analysis to understand the total cumulative pedestrian impact from OSD and the Metro station at adjacent major intersections and impact on surrounding footpaths.

The impact and operating conditions of footpaths is measured as Level of Service (LoS) Criteria and the adopted measures are presented in **Table 6** and shown graphically in **Figure 33**.

**Table 6:** FRUIN Level of Service Parameters - Walkways

Level of Service	Flow Rate (Ped / m / min)		Condition
	Min	Max	
A		23.0	Free flow
B	23.0	32.8	Minor conflicts
C	32.8	49.2	Reduced speed
D	49.2	65.6	Most restricted
E	65.6	82.0	All restricted
F	82.0		Shuffling only

Source - *Pedestrian Planning and Design*, J J Fruin 1987



**Figure 33:** Illustration of Footpath Level of Service Thresholds

Source: TRB, 1994 adopted from Fruin 1987

The results from the static pedestrian assessment demonstrated that most areas achieve the minimum design requirements of LoS C, however the following potential issues were identified:

- The corners of the Park Street / Pitt Street intersection could become highly congested in the peak 15-minute period and may result in large queuing areas which hinder through flows. This is potentially applicable for the north-western corner in the PM Peak
- The corners of the Park Street / Castlereagh Street intersection could become highly congested in the peak 15-minute period and may result in large queuing areas which hinder through flows. This is potentially applicable for the north-western corner in the AM Peak.

Dynamic pedestrian modelling using STEPS simulation software was carried out in relation to the 2036 AM and PM peak periods under normal operations. The results were assessed in relation to the Scope and Performance Requirements (SPR).

The modelling results indicate that some areas within the Pitt Street Precinct do not achieve the design criteria.

People experience up to queuing LoS D in waiting areas for crossings. The highest levels of queuing occur at the Bathurst Street / Pitt Street intersection, the north crossing of Pitt Street at the Pitt Street/Park Street intersection and the crossings of Castlereagh Street at the Castlereagh Street/Park Street intersection.

The pedestrian modelling report identified that high densities in waiting areas could be reduced by reducing the signal cycle times and optimising the signal phasing or providing kerb extensions. Alternatively, high densities in circulation areas could be reduced by increasing the footpath width or removing street furniture in these areas.

Generally, on footpaths, pedestrians experience Walkways LoS A to LoS C. In isolated areas this reaches LoS D to LoS E. These higher densities are partly a result of surges of people on the pavements created by crossings and departing the station. Hotspots are mostly a result of crossflows.

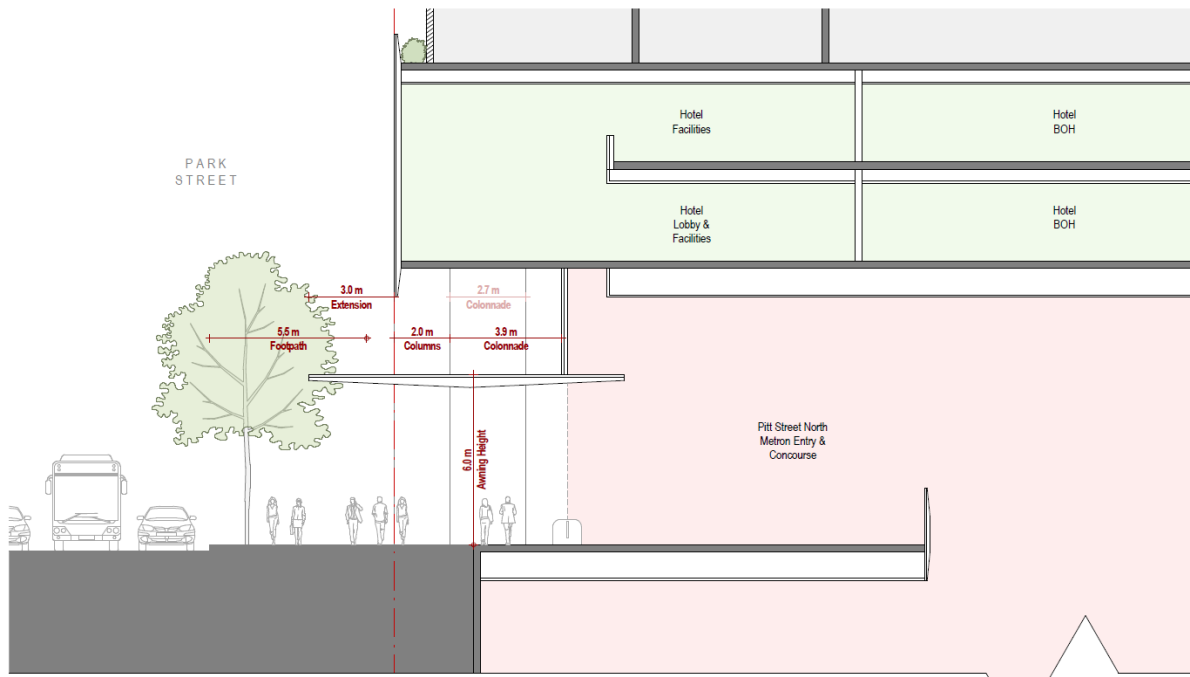
Notwithstanding the above, pedestrian flows generated by the OSD development are expected to be a minor proportion of the total pedestrian flows generated by the integrated development.

The estimated increase in pedestrian demand on the footpaths would be largely attributed to the introduction of Pitt Street (north) Cross Station.

It is noted that the Indicative OSD design proposes a significant setback of the building fronting Park Street and introducing a covered colonnade which will increase the width (ie. capacity) of the existing footpath and improve the pedestrian amenity for OSD, Metro Station and Park Street bus stop pedestrians as well as general passing foot traffic.

The indicative proposed building setback arrangements are shown in **Figure 34**.





**Figure 34:** Indicative OSD Design for Park Street Frontage including Building Setback for Increased Footpath Width

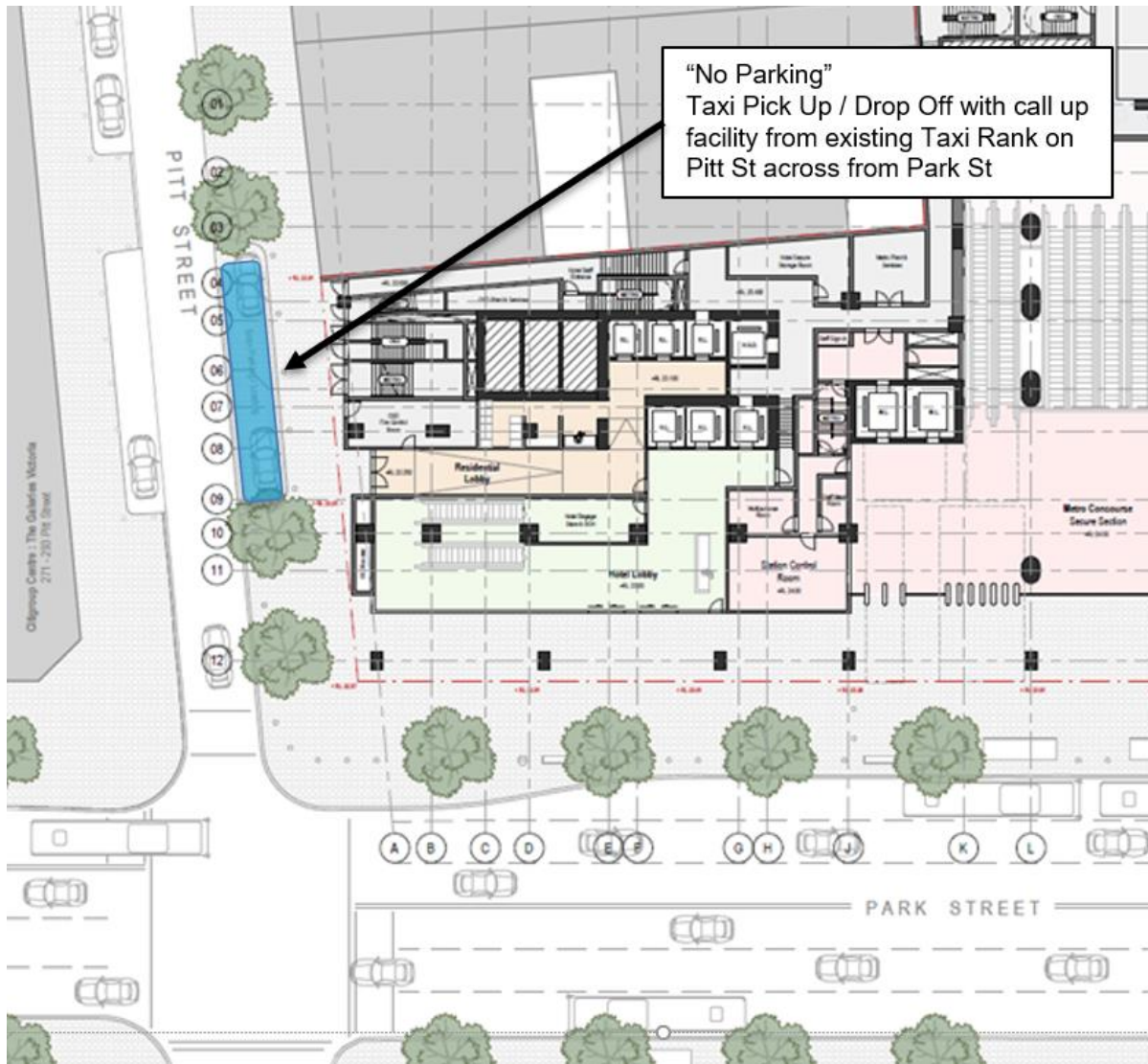
## 6.7. Taxi facilities and operation

As described in Section 1, it is proposed that the existing taxi zone facility on the eastern side of Pitt Street to the south of Park Street would be appropriate for use as a taxi storage facility for the proposed hotel, commercial and residential uses of the OSD.

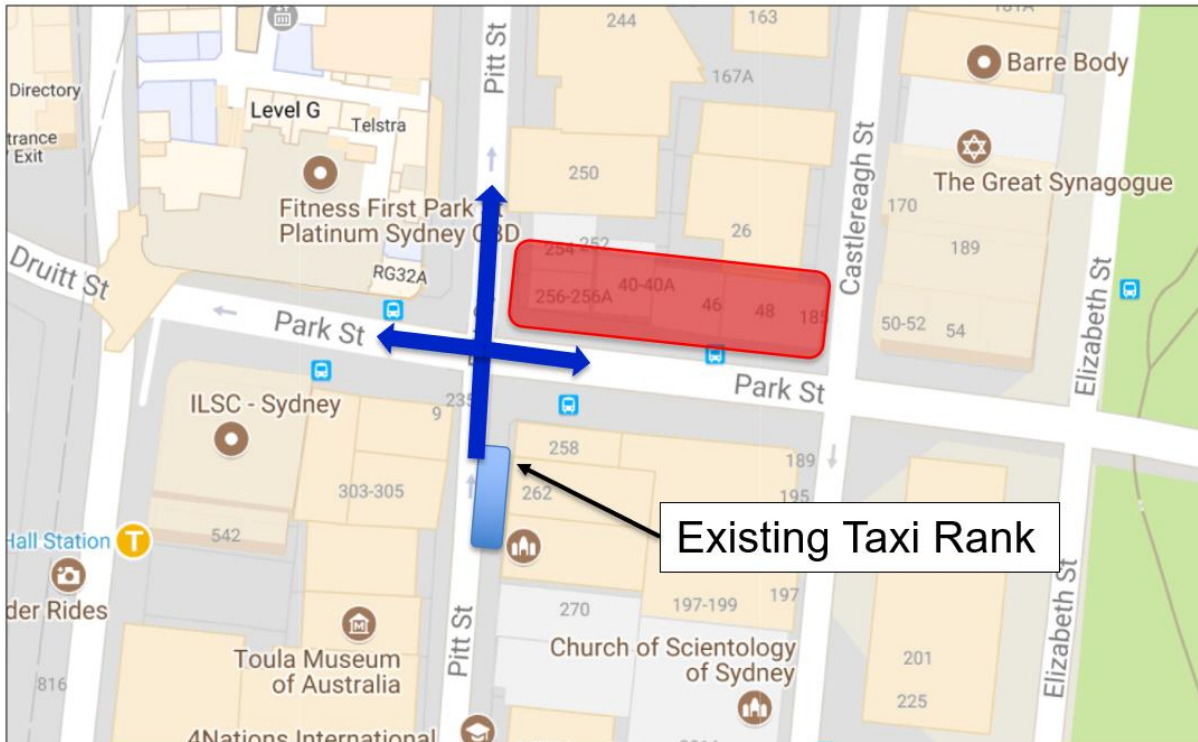
Operationally, passengers could walk across Park Street to access a waiting taxi or they could hail a taxi from the rank with the pick up to occur at the kerb side “No Parking” zone on the site’s Pitt Street frontage (see **Figure 35**).

By accessing the taxi from the existing taxi rank, drivers have numerous route options to access CBD locations or to access the major CBD exit routes. As shown in **Figure 36**, taxis departing the existing Pitt Street rank have the ability to turn east, west or continue north into the CBD at the Park Street intersection.

These taxi arrangements would service the demands of the proposed hotel within the OSD development along with Station and other users in a manner consistent with other hotels within the CBD.



**Figure 35:** Proposed Pitt Street Drop Off / Pick Up Zone



**Figure 36:** Taxi Departure Routes from Existing Taxi Zone

## 6.8. Coach facilities and operation

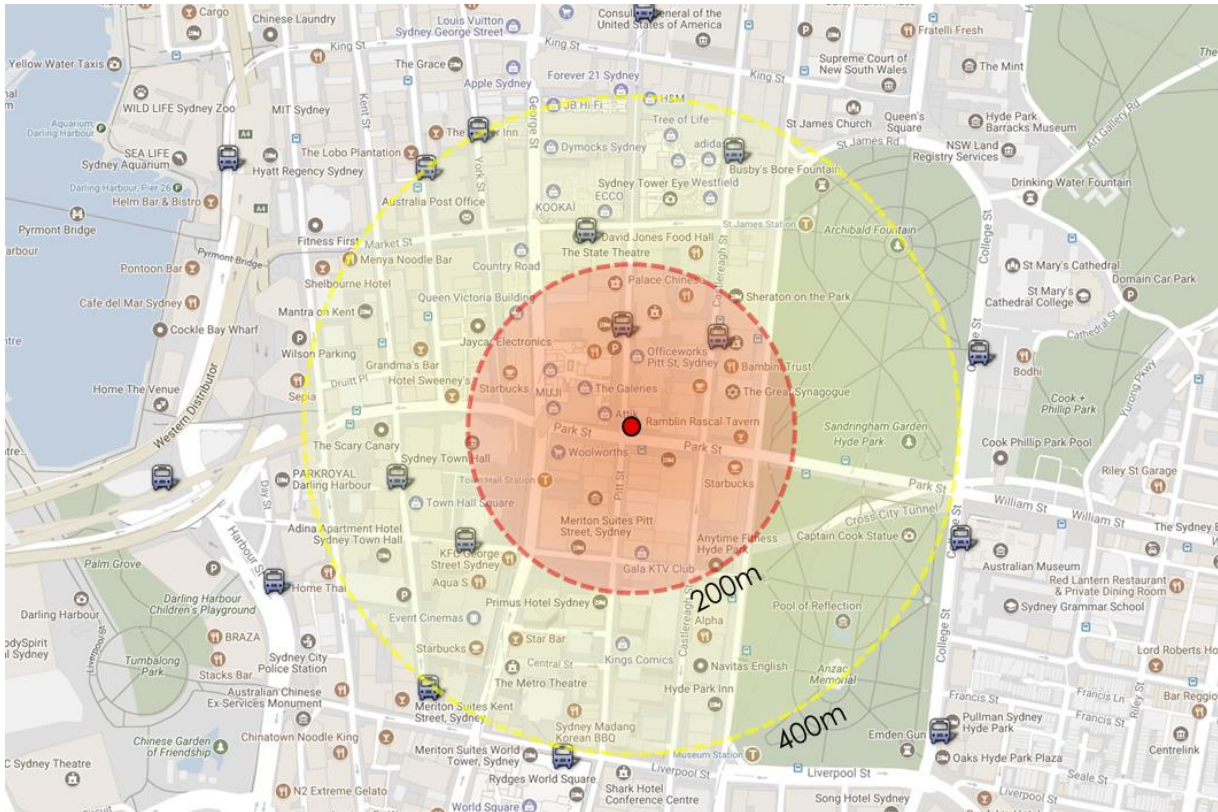
With regard to on site provisions for bus / coach parking associated with Hotel facilities, Sydney DCP 2012 states:

*“Provision for tourist coach parking in conjunction with hotels is to take into account available off-site coach parking. Where practicable, and subject to urban design, heritage and streetscape considerations, loading and unloading of passengers and baggage is to be accommodated within the development site.”*  
 Sydney DCP 2012 Schedule 7.8.2(2).

Given the site’s frontage constraints and ground floor spatial requirements for the Metro station, it is considered that the provision of an on site bus / coach parking area for the hotel uses is impractical.

While the site’s Park Street frontage is and will continue to be a significant bus zone, it is considered that the utilisation of existing on street bus / coach pick up and set down facilities would be the most appropriate way to accommodate what is expected to be a relatively low demand for such a facility.

Notwithstanding the above, there are numerous coach / bus pick up and set down facilities provided within the CBD (see **Figure 37**).



**Figure 37: Bus / Coach Pick Up / Set Down Locations within the CBD**

As shown in **Figure 37**, there are several designated coach / bus facilities within close proximity to the site.

It is proposed that the existing bus / coach zone on Pitt Street and Castlereagh Street (see **Figure 19**) would provide convenient and accessible pick up and set down facilities for the proposed hotel use within the Pitt Street North OSD.

## 6.9. Emergency access

Emergency vehicle access would continue to be possible via each of the site's frontages to Pitt Street, Park Street and Castlereagh Street.

It is not anticipated that there would be any impacts to emergency vehicle access as a result of the OSD proposal. An emergency response plan will be prepared for the OSD development which will take into account the Metro station specific emergency response plan.

## 6.10. Cumulative traffic impacts

As described in Section 6.1 above, the OSD development will result in a significant reduction in site traffic generation compared with previous uses of the site.



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Thus with regard to the cumulative implications of the concept OSD application, the proposal will have a positive impact to the operation of the surrounding road network.

## 7. Construction traffic management

### 7.1. Construction management statement

The concept SSD Application for the Pitt Street North OSD proposal will be followed by a detailed SSD application for the design and construction of the OSD.

As part of the concept SSD Application Sydney Metro has prepared a Construction Management Statement for Pitt Street North OSD proposal.

The Construction Management Statement has been prepared in accordance with the concept SSD Application SEARs and addresses how future construction stages will manage impacts to pedestrians, rail users, bus services and taxis.

The Construction Management Statement has identified a number of measures to minimise and mitigate construction impacts having regard to different construction staging scenarios.

### 7.2. Construction traffic management principles

The traffic management task common to each staging scenario will require the OSD developer to:

- Maximise public safety
- Minimise disruption to pedestrians, cyclists and motorists
- Ensure construction traffic accesses the arterial network as soon as practicable on route to, and immediately after leaving, the construction site
- Ensure buses run on time with no disruption to routes and stops, where possible
- Minimise changes to traffic operation and kerbside access
- Minimise construction traffic generation during network peak periods
- Maintain access to properties and businesses
- Work collaboratively with other stakeholders and other major projects to mitigate traffic and transport impacts.

### 7.3. Construction traffic management methodology

The contractor responsible for the delivery of the OSD works will be required to prepare a Construction Traffic Management Plan (CTMP) prior to works commencement. A CTMP is a plan addressing the traffic management principles listed above and aims to demonstrate how traffic and pedestrians will be managed when construction works are being carried out. The CTMP will be prepared in accordance with the Construction Traffic Management Framework (CTMF).

The CTMF, prepared by the Sydney Metro Delivery Office in accordance with Condition E81 of the CSSI Approval (9 January 2017), provides the overall strategy and approach for



construction traffic management for the Metro project, and an outline of the traffic management requirements and processes that are common to the work sites. It establishes the traffic management processes and acceptable criteria to be considered and followed in managing roads and footpaths adjacent to Project worksites.

The principles and procedures outlined in the CTMF are proposed to apply to OSD construction where there is concurrent station and OSD construction, notwithstanding Clause A4, Schedule 2 of the CSSI (Chatswood to Sydenham) Approval. However, the Sydney Co-Ordination Office (SCO) and Roads and Maritime may require that additional OSD specific requirements are placed on any approval.

The CTMP itself will describe in detail what work activities are proposed, how they will be staged, the potential impact on the roadway and all road users, and how these impacts will be managed. A CTMP will, where relevant, comprise:

- Traffic Control Plans
- Vehicle Movement Plans
- Pedestrian Movement Plans
- Parking Management Plans
- Traffic Staging Plans.

All of the above plans will respond to specific works and the removal of any of the above management plans should be justified and agreed with the approval authority prior to the commencement of works. The Parking Management Plan will also provide details regarding on-site and off-site staff parking arrangements, including any proposed busing to and from worksites.

## 8. Conclusions

This section summaries the key findings from the assessment of the Concept SSD application, demonstrates how the assessment aligns with the SEARs and nominates mitigation measures that will alleviate the potential impacts of the proposed development. These measures will be progressed as part of the subsequent detailed SSD application.

### 8.1. Key findings

The key findings from the assessment are as follows:

- The proposed concept OSD aligns with NSW Government and Council transport strategies and policy and in particular the objectives of Future Transport 2056
- The 2016 travel characteristics for people who work in the destination zone which includes the site highlights that:
  - The current high proportion of journey-to-work trips are made by train and bus, which highlights that approximately 80 per cent of trips are attributable to these modes
  - A total public transport mode share of 80 per cent, which is significantly greater than the Greater Sydney average of 20 per cent
  - Between 2011 – 2016, journey to work by public transport increased by 4% from 76% to 80% of all journey to work trips while private vehicle trips to work fell by 5% from 16% to 11% for the same period
  - A low proportion of private vehicle trips for journey to work to a CBD location, which currently represents 11 per cent of trips to the area indicates the high public transport accessibility of the OSD site
- The proposed provision of up to 55 car parking spaces (including courier / van spaces) is in accordance with Council's Sydney LEP 2012 maximum allowable requirements for car parking for new developments in this locality
- The estimated traffic generation from the proposed concept OSD development will result is a significantly lower site traffic generation compared to previous uses of the site and will not adversely impact on the operating performance of the surrounding road network
- That the proposed loading dock and separate van / courier parking area is capable of accommodating two medium rigid vehicles, two small rigid vehicles and 4 vans to support metro station and OSD operations and eight courier's spaces and its impact on the surrounding road network and access can be managed through building servicing plans
- Access will be managed through the provision of a single consolidated two-way access driveway located along the Castlereagh Street frontage. A single vehicle access will minimise the potential vehicle / pedestrian conflicts to a single location. The driveway location on Castlereagh Street at the existing site access location avoids traffic movements across the busy Pitt Street and Park Street footpaths

- The location of the OSD will enable its users to benefit from a vast number of public and active transport modes
- The indicative OSD design includes a significant building setback (5.9 metres) at the Park Street frontage to assist with pedestrian movements to and from the Metro Station, while facilitating pedestrian storage for Park Street bus zones

## 8.2. Alignment with SEARs

The *Transport, Traffic, Parking and Access* section of the *SEARs* indicates that the EIS must include a Transport and Traffic Impact Assessment that provides, but is not limited to the below. This section demonstrates how the requirements are achieved for *Transport, Traffic, Parking and Access*.

**Table 7:** SEARS Compliance: Transport, Traffic, Parking and Access

Item	Requirement	Section	Comment
TT1	Accurate details of the current daily and peak hour vehicle, public transport, pedestrian and bicycle movements from existing buildings/ uses on the site using the adjacent and surrounding road network	4	<p>The assessment together with the CSSI (Chatswood to Sydenham) Approval highlights the functional, role and quality the existing transport network, which includes an area accessibility review.</p> <p>The assessment of the Indicative OSD proposal has been considered within the context of the integrated station development, namely the construction and operation of the Pitt Street Metro Station.</p>
TT2	Forecast total daily and peak hour trips likely to be generated by the proposed development including vehicle, public transport, pedestrian and bicycle trips, together with cumulative impacts of existing, proposed and approved developments in the area and any transport/ traffic upgrade	6	<p>The assessment defines both current and expected movements generated by the OSD proposal and confirms the approach undertake to address cumulative impact of the OSD and Metro Station.</p> <p>The assessment concludes that the traffic generation resulting from the proposed OSD will be significantly less than the previous site uses as a direct result of limited on site parking provisions.</p> <p>This will support a positive shift in travel mode share away from private vehicle travel.</p> <p>The current cycle network identified in Council's plan provides and supports access to planned OSD accesses via Castlereagh Street and Pitt Street.</p> <p>Planned transport infrastructure upgrades that support the application and the progressive development of the wider precinct are identified and managed through the action plan section of the Interchange Access Plan being proposed under the terms of the CSSI (Chatswood to Sydenham) Approval. The action plan</p>

			recommendations support both the station and OSD elements and form part of a wider integrated transport plan that will help to improve access, travel choices and support the continued growth of the Sydney CBD.
TT3	Impacts of the proposed development on the operation of existing and future transport networks, including the public transport capacity and its ability to accommodate the forecast number of trips to and from the development	4, 6	<p>The proximity to public transport and type of development is supportive of NSW Government's objective of better managing demand, optimising infrastructure and services and promoting access to key centres by public transport through 30 minute travel catchments.</p> <p>The assessment provides an understanding of travel patterns and the accessibility of the site under current operating conditions. This together with the new turn-up and go service offered by Metro, expected travel time savings and the additional service capacity on the new Metro line offers a unique opportunity that will support the continuous shift towards active and public transport as the preferred travel modes for accessing the Sydney CBD.</p> <p>This trend is supported by a proposed reduced parking provision for the site when compared to the previous on-site development.</p>
TT4	Detailed assessment of the existing and future performance of key intersections providing access to the site, supported by appropriate modelling and analysis to the satisfaction of RMS and TfNSW	4, 5, 6	<p>As the OSD proposal will lead to a reduction in site traffic generation, traffic modelling has not been undertaken.</p> <p>Pedestrian modelling for the proposed development supports both station and OSD and is consistent with the RMS/ TfNSW guidelines for traffic generating development and traffic modelling.</p>
TT5	Measures to mitigate impacts of the proposed development on the operation of existing and future traffic, public transport, pedestrian and bicycle networks, including any required upgrades	5, 6	The assessment provides an understanding of the mitigation measures that will help to both manage the delivery and operation of the proposed development.
TT6	Proposed Hotel Pick Ups and drop off via 'kiss and drop', point-to-point services, bus and coach without adverse traffic impacts.	4, 6	The proposed coach and taxi arrangements set out in Section 4 and 6 have been developed in extensive consultation with SCO / Sydney Metro to accommodate the potential coach, taxi and point to point travel demands associated with the OSD proposal.
TT7	Proposed car and bicycle parking provision for workers and visitors, including consideration of the availability of public	4,5,6	The concept proposal aligns with LEP 2012 provisions for both bike and car parking spaces for new developments, considers accessibility options and services offered by existing public transport and the future Metro, and will be

	transport and the requirements of the relevant parking codes and Australian Standards		delivered in accordance with parking codes and the Australian Standards.
TT8	Loading dock and servicing arrangements, including consideration of loading zone hub facilities	5.4	The concept proposal includes building servicing principles, which are evidence based and support the efficient and safe operation of the proposed off-street loading and servicing facility, which aims to minimise impacts on the surrounding road network through safeguarding for future connections.
TT9	Measures to be implemented to encourage users of the development to make sustainable travel choices, including walking, cycling, public transport and car sharing, such as provision of adequate bicycle parking and end of trip facilities	4,5	<p>The concept proposal proposes reduced car parking provision from the previously approved on-site development, utilises its proximity over a Metro station and connectivity to other centres, and offers a higher density that supports planned growth in employment in centres and walking, cycling and public transport access outcomes.</p> <p>The proposed provision of 304 on site bike parking spaces for residents, 51 publicly accessible visitor bicycle spaces and end of trip facilities allows for easy access by non-private vehicle modes and helps align the scheme with Future Transport objectives and promote sustainable travel outcomes. All of the above will be supported by a commitment to develop Green Travel Plans in line with Sydney DCP 2012 guidelines as part of future detailed SSD application.</p>
TT10	Assess the impact of the proposed driveways, with consideration of a shared single driveway on Castlereagh Street.	1.7, 6.2	The assessment of the single driveway at Castlereagh Street has considered traffic generation and demand for both the car park lift, loading dock access and the interaction of the two facilities. The assessment has provided recommendations for the management of the site access and loading dock space.
TT11	Sustainable transport options should be encouraged with a minimum of car parking provided.	5.2	The proposed provision of up to 55 onsite car spaces (including van and car share spaces) represents a mere 20% of the maximum allowable provision as defined by the Sydney LEP 2012.

### 8.3. Recommendations

The following recommendations are made to support the approval of the concept SSD Application for the Pitt Street North OSD proposal:

- The adoption of servicing planning principles and commitment to develop servicing plans to manage loading dock operations as part of the detailed planning application process.
- A commitment to provide parking in line with the Sydney LEP, namely on site car parking not to exceed the maximum allowable limits set out for the various intended uses of the site.
- The inclusion of accessible parking spaces in accordance with Sydney LEP and AS 2890 and as such will be situated within easy access of lifts.
- All pedestrian access points and corridors will be designed to comply with AS1428.1 and 1428.2 and will form part of the detailed planning of the site.
- All parking areas will be designed to comply with the relevant Australian Standards including AS 2890.1, 2890.2, 1428.1 and 1428.2 to help manage vehicle access and circulation in parking areas.
- A commitment to deliver a development with bike parking spaces in accordance with Sydney LEP 2012 requirements, which are easily accessed and are supported by end of trip facilities.
- The provision for safe access, secure and conveniently located bike parking facilities for residents within the building to support and promote cycling and help Sydney CBD improve its cycling mode share rates.
- Adoption of the green travel plan and associated measures in the conditions of consent for the building to help manage travel demand by supporting and promoting travel by alternatives modes of travel to the private vehicle.
- All pedestrian access points and corridors are expected to be designed to comply with AS1428.1 and 1428.2 and will be appraised as part of the detailed planning of the site.
- The detailed SSD applications to develop a strategy and technology solutions that will help manage conflict between loading dock, parking area access and bike parking access.
- The adoption of Construction Traffic Management Principles, staging options and construction traffic management documentation set in Section 8 of this report with a focus on managing the subsequent impact on the CBD public domain and road environment as part of detailed planning of construction.



- The detailed design of the OSD building and assessment of its impact is to be undertaken in consultation with the Traffic and Transport Liaison Group(s) established under Condition of Approval E77 of CSSI Approval No. 15\_7400 for the Sydney Metro City & Southwest Chatswood to Sydenham project, until such time as completion of Pitt Street Station (north) has been reached. Beyond completion of Pitt Street Station, detailed design of the OSD building and its traffic, parking, pedestrian and cycle accessibility impacts would require consultation with relevant stakeholders.

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## Appendix A – Vehicle Swept Path Analysis

CASTLEREAGH STREET



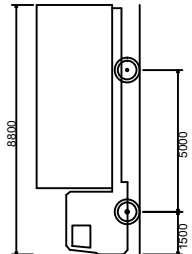
VEHICLE EXITING

NSW Masonic Club  
169 - 173 Castlereagh Street



VEHICLE ENTERING

NSW Masonic Club  
169 - 173 Castlereagh Street



- 8800mm Overall Length
- 2500mm Overall Width
- 3633mm Overall Body Height
- 428mm Min Body Ground Clearance
- 2500mm Track Width
- 4.00s Lock-to-lock time
- 10000mm Curb to Curb Turning Radius

KEY:

- Wheel path: Forward (red line), Reverse (green line)
- Body envelope: Forward (red hatched box), Reverse (green hatched box)
- 300mm clearance: (blue dashed line)

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	JR	JR	29/01/18
B	UPDATED ARCHITECTURAL DRAWING	LM	SB	JR	12/03/18
C	UPDATED ARCHITECTURAL DRAWING	LM	JR	JR	23/03/18
D	UPDATED SWEEP PATH FIGURES	LM	JR	JR	26/03/18

**The Transport Planning Partnership**  
 Suite 402, 27 Alchison Street  
 St. Leonards NSW 2065  
 Tel: 02 9437 7800  
 Email: info@tpp.net.au

PROJECT		SYDNEY METRO PITT STREET NORTH OSD	
TITLE		AS2890.2 8.8m MEDIUM RIGID VEHICLE SWEEP PATH ANALYSIS	
DWG No.	FIGURE 1	DATE STAMP	26 MARCH 2018
PROJECT No.	17346	SCALE	1:200 @A3
REV.	D		

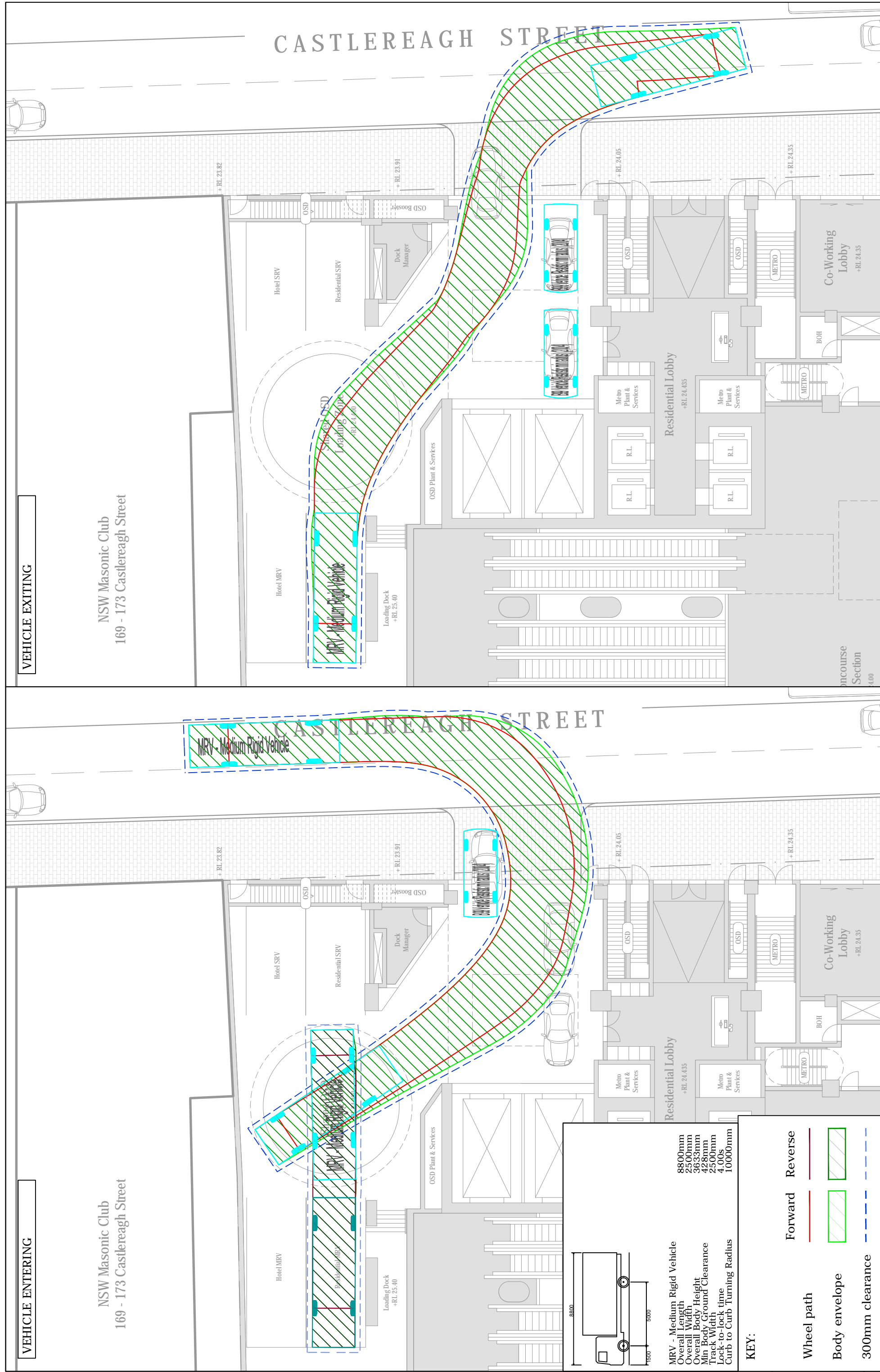
CASTLEREAGH STREET

VEHICLE EXITING

NSW Masonic Club  
169 - 173 Castlereagh Street

VEHICLE ENTERING

NSW Masonic Club  
169 - 173 Castlereagh Street



**MRV - Medium Rigid Vehicle**  
 Overall Length 8800mm  
 Overall Width 2500mm  
 Overall Body Height 3633mm  
 Min Body Ground Clearance 428mm  
 Track Width 2500mm  
 Lock-to-lock time 4.00s  
 Curb to Curb Turning Radius 10000mm

**KEY:**

**Wheel path**  
 Forward (Red line)  
 Reverse (Blue dashed line)

**Body envelope**  
 (Green hatched area)

**300mm clearance**  
 (Blue dashed line)

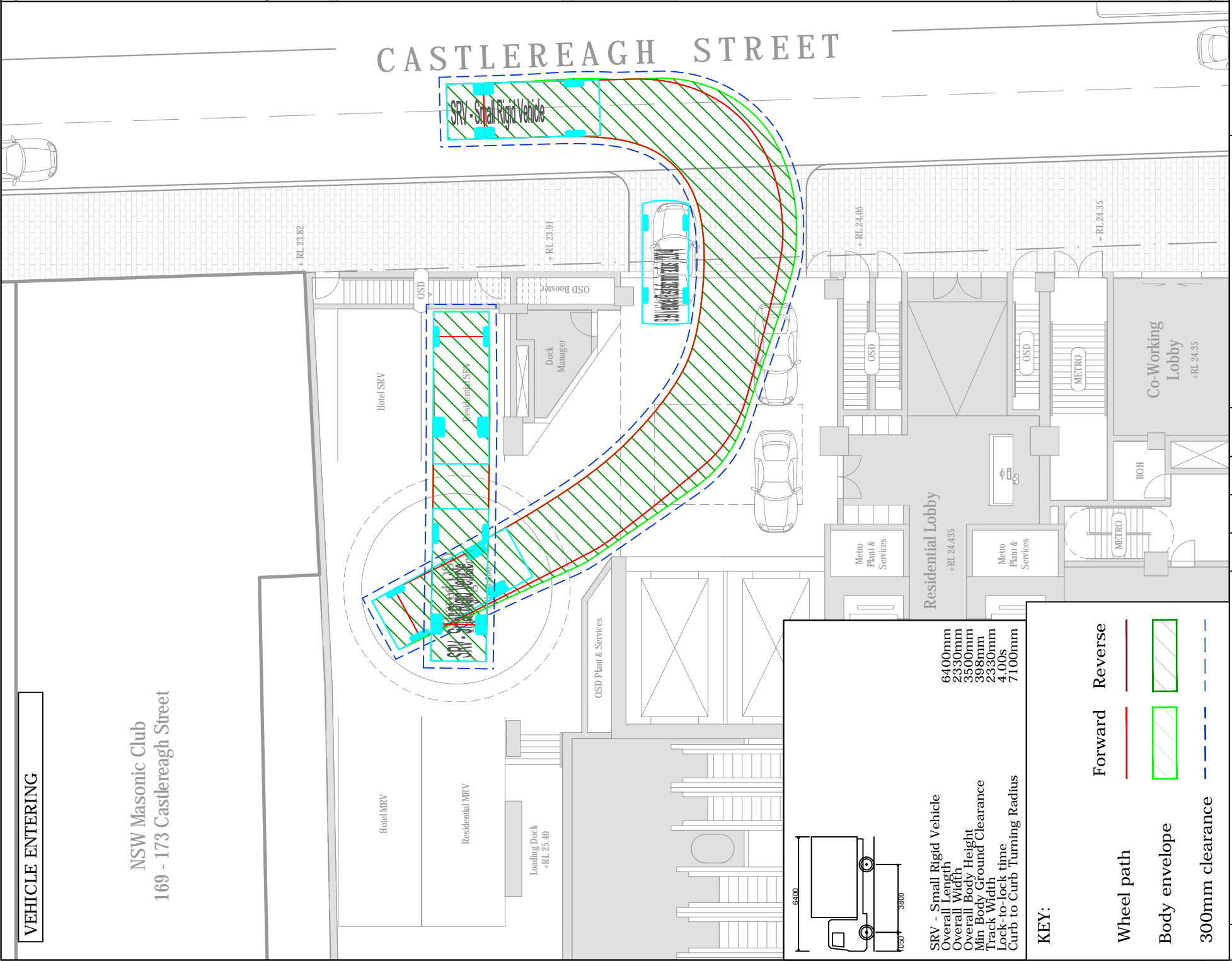
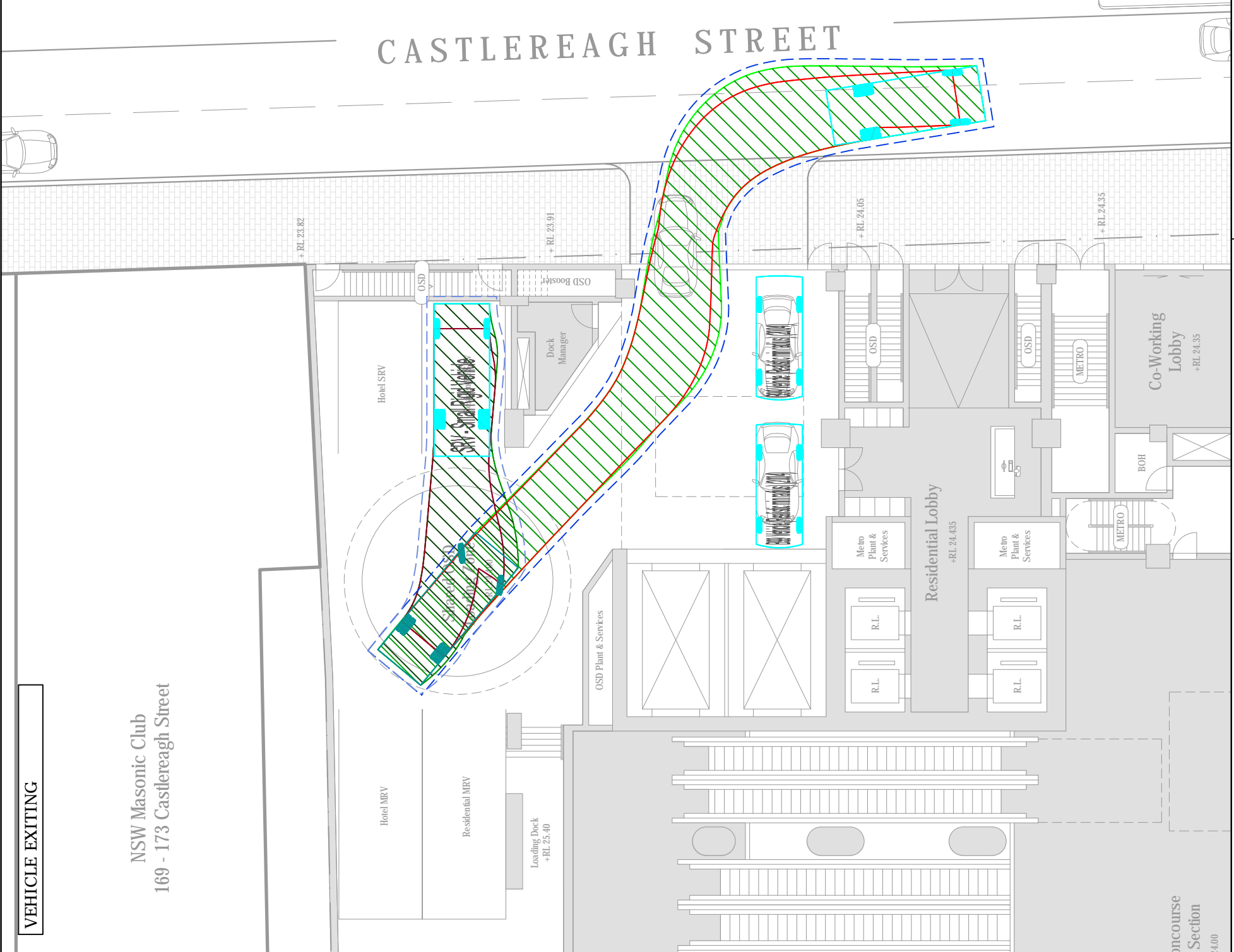
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D	UPDATED SWEEP PATH FIGURES	LM	JR	JR	26/03/18

PROJECT		SYDNEY METRO PITT STREET NORTH OSD	
TITLE		AS2890.2 8.8m MEDIUM RIGID VEHICLE SWEEP PATH ANALYSIS	
DWG No.		FIGURE 2	
DATE STAMP		26 MARCH 2018	
PROJECT No.		17346	
SCALE		1:200 @A3	
REV.		D	

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# CASTLEREAGH STREET

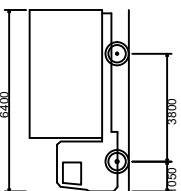


VEHICLE EXITING

NSW Masonic Club  
169 - 173 Castlereagh Street

VEHICLE ENTERING

NSW Masonic Club  
169 - 173 Castlereagh Street



- SRV - Small Rigid Vehicle
- Overall Length 6400mm
- Overall Width 2330mm
- Overall Body Height 3500mm
- Min Body Ground Clearance 398mm
- Track Width 2330mm
- Lock-to-lock time 4.00s
- Curb to Curb Turning Radius 7100mm

KEY:

- Wheel path: Forward (red line), Reverse (red line)
- Body envelope: Forward (green hatched), Reverse (green hatched)
- 300mm clearance: Forward (blue dashed line), Reverse (blue dashed line)

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
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C	UPDATED ARCHITECTURAL DRAWING	LM	JR	JR	23/03/18
D	UPDATED SWEEP PATH FIGURES	LM	JR	JR	26/03/18

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PROJECT		SYDNEY METRO PITT STREET NORTH OSD	
TITLE		AS2890.2 6.4m SMALL RIGID VEHICLE SWEEP PATH ANALYSIS	
DWG No.	FIGURE 3	DATE STAMP	26 MARCH 2018
PROJECT No.	17346	SCALE	1:200 @A3
REV.	D		



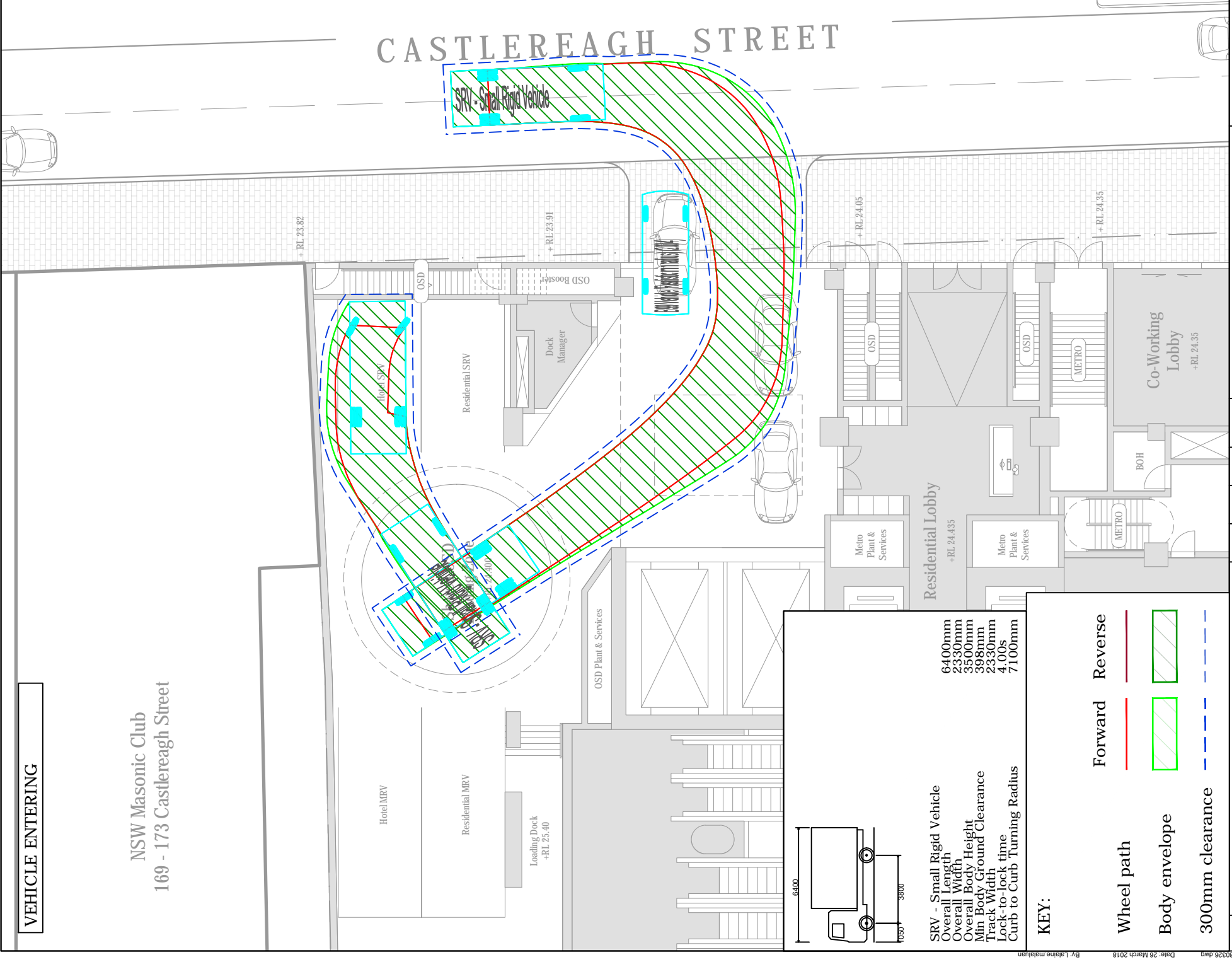
# CASTLEREAGH STREET



VEHICLE EXITING

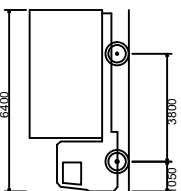
NSW Masonic Club  
169 - 173 Castlereagh Street

# CASTLEREAGH STREET



VEHICLE ENTERING

NSW Masonic Club  
169 - 173 Castlereagh Street



SRV - Small Rigid Vehicle  
Overall Length 6400mm  
Overall Width 3800mm  
Overall Body Height 1950mm  
Min Body Ground Clearance 398mm  
Track Width 2330mm  
Lock-to-lock time 4.00s  
Curb to Curb Turning Radius 7100mm

KEY:

- Wheel path: Forward (Red line), Reverse (Red line)
- Body envelope: Forward (Green hatched), Reverse (Green hatched)
- 300mm clearance: Forward (Blue dashed line), Reverse (Blue dashed line)

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
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D	UPDATED SWEEP PATH FIGURES	LM	JR	JR	26/03/18

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Suite 402, 27 Alchison Street  
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Tel: 02 9437 7800  
Email: info@tpp.net.au

PROJECT		SYDNEY METRO PITT STREET NORTH OSD	
TITLE		AS2890.2 6.4m SMALL RIGID VEHICLE SWEEP PATH ANALYSIS	
DWG No.	FIGURE 4	DATE STAMP	26 MARCH 2018
PROJECT No.	17346	SCALE	1:200 @A3
REV.	D		