

TRANSPORT, TRAFFIC AND PARKING ASSESSMENT REPORT

APPENDIX P





Sydney Metro City & South West

Victoria Cross Over Station

Development:

Traffic and transport report

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1.0 Introduction

1.1 Purpose of this report

This report supports a concept State Significant Development Application (concept SSD Application) submitted to the Department of Planning and Environment (DP&E) 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.

Transport for NSW (TfNSW) is seeking to secure concept approval for a commercial office tower above the Victoria Cross Station, otherwise known as the over station development (OSD). The concept SSD Application seeks consent for a building envelope and its use as a commercial premises (office, business and retail), maximum building height, maximum gross floor area, pedestrian and vehicular access, circulation arrangements and associated car parking, future subdivision (if required) and the strategies and design parameters for the future detailed design of development.

TfNSW proposes to procure the construction of 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 DP&E on 9 January 2017.

The project is identified as State Significant Development pursuant to Schedule 1, 19(2) (a) of the State Significant Development (SSD) pursuant to Schedule 1, 19(2) (a) of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). This relates to the project's attributes, which include its proximity to the rail corridor, and its inclusion of railway infrastructure and commercial premises with a Capital Investment Value of more than \$30 million.

This report has been prepared to specifically respond to the Secretary's Environmental Assessment Requirements (SEARs) issued for the concept SSD Application for Victoria Cross OSD. The SEARs were issued on 30th November 2017 and require that the EIS include a Transport and Traffic Impact Assessment that provides, but is not limited to, the following:

- 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;
- 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;

- 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;
- 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;
- 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;
- Proposed car and bicycle parking provision for workers and visitors, including consideration of the availability of public transport and the requirements of the relevant parking codes and Australian Standards;
- Loading dock and servicing arrangements, including consideration of loading zone hub facilities;
- 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;
- Consider the future pedestrianisation of laneways east of the Metro site (Denison Street, Spring Street and Little Spring Street) with regard to the North Sydney Council concept plan for the treatment of laneways in the CBD;
- Consider the impacts of the proposed Western Harbour Tunnel Beaches Link; and
- Identify required work zones and the functionality and impact on pedestrian amenity and public domain.

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 (Stage 1), which is due for completion in 2019 and Sydney Metro City & Southwest (Stage 2), which is due for completion in 2024 (Refer to **Figure 1**).



Figure 1: Sydney Metro alignment map

Stage 2 of Sydney Metro 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 (7) new metro stations, including at North Sydney. 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 lodged by TfNSW 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 OSD (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 OSD to be more efficiently built and appropriately integrated into the metro station structure.

The EIS for the Chatswood to Sydenham component of the 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 original station design remains approved. This modification application was approved on 22 March 2018.
- Modification 4 - Sydenham Station and Sydney Metro Trains Facility South which incorporates 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 Stage 2 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 part of the project, referred to as the Sydenham to Bankstown Upgrade, is the subject of a separate CSSI Application (Application No. SSI 17_8256) which is currently being assessed by the DP&E.

1.3 Planning relationship between Victoria Cross station and the OSD

While the Victoria Cross station and OSD will form an Integrated Station Development, the planning pathways defined under the *Environmental Planning & 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 include the construction of below and above ground structures necessary for delivering the station and also enabling construction of the integrated OSD. This includes 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
- Pedestrian through-site link
- 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 Victoria Cross is defined by RL 82), above which would sit the OSD. This delineation is illustrated in **Figure 2**.

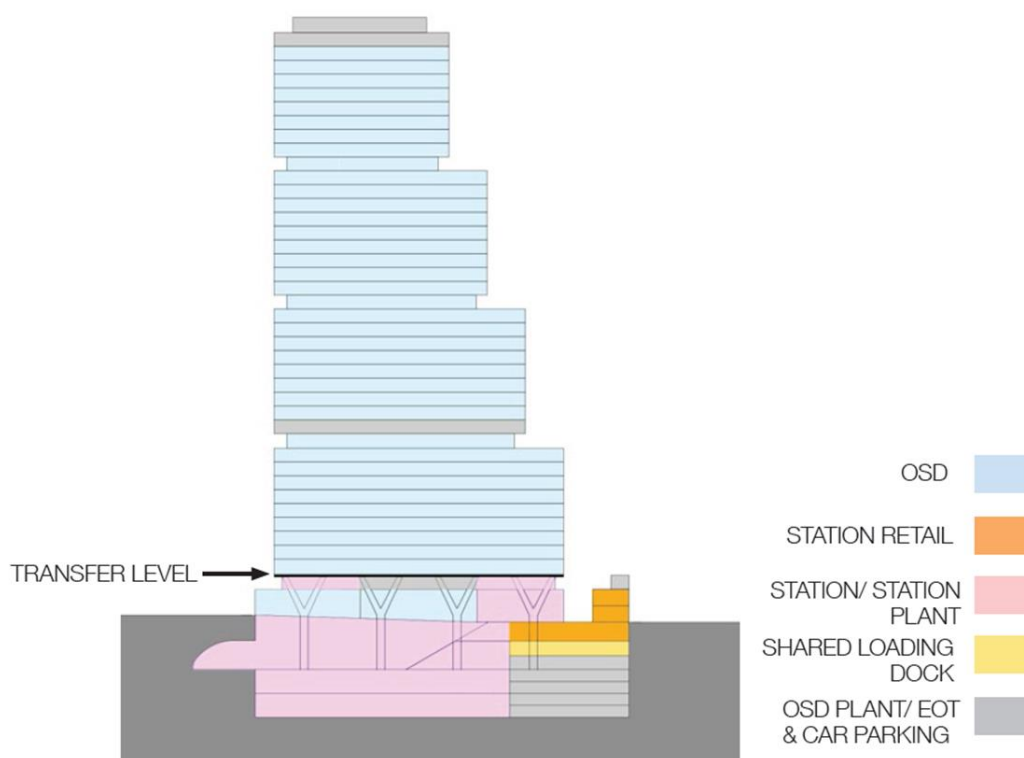


Figure 2: Delineation between Metro station and OSD

The CSSI Approval also establishes the general concept for the ground plane of Victoria Cross Station including access strategies for commuters, pedestrians and workers. In this regard, pedestrian access to the station would be from Miller and Denison Streets and the commercial lobby would be accessed from Miller Street. Retail uses (approved under the CSSI Approval) would be located on the ground floor of the development at both the Miller Street and Denison Street levels activating the through-site link. Separate consent would be sought in the future for the fit-out and specific use of this retail space.

Since the issue of the CSSI Approval, TfNSW 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 Victoria Cross 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 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) and 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 North Sydney area.
- The network assessment is limited to Weekday AM and PM peak period site survey information obtained for local intersections in proximity of the site and RMS SCATS data provided by RMS.
- The land uses are consistent with the detail provided in the concept plan SSD Application for the Victoria Cross 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 assessment of the site and concept proposal does not consider development staging as these are unlikely to impact on the local road network above or beyond the current station construction activity. The possible construction staging scenarios are addressed in Section 8.
- The impact from the proposed construction activity on surrounding development is expected to be managed through the staging of the development as stated in section 8.
- The assessment was carried out at a high level using SIDRA modelling software and does not consider detailed operational aspects related to specific uses beyond the operation of local intersections during weekday AM and PM peak periods.

1.5 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 North Sydney CBD, and an overview of the proposed development and its key features
- ***Section 2.0*** – covers the scope of the assessment
- ***Section 3.0*** – covers relevant legislation, policies and guidelines and its association with the traffic and transport elements of this application

- **Section 4.0** – provides an understanding of the existing situation including area and network characteristics and the service and facility conditions.
- **Section 5.0** – defines the transport, traffic, parking and access attributes of the proposal that form the basis for the assessment in section 6.
- **Section 6.0** – assesses the transport, traffic, parking, servicing and access impacts from the likely operations of the proposed OSD Concept Design
- **Section 7.0** – provides an understanding of the key cumulative impacts and the proposals relationship with known surrounding schemes
- **Section 8.0** – 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 9.0** – 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.

1.6 The site

The Victoria Cross OSD site is located at the southeast corner of the intersection of Miller and Berry Streets, North Sydney, above the southern portal of the future Victoria Cross Station (refer **Figure 3**). The site is located in North Sydney CBD, which is identified as part of Sydney's "Harbour CBD" (along with Sydney CBD) in the *Greater Sydney Region Plan (2018)*. It is the third largest office market in Sydney and is a key component of Sydney's Global Economic Corridor.



Figure 3: Victoria Cross Station location plan

The proposed Victoria Cross Station is expected to perform as a key destination station along the future Sydney Metro network through its ability to serve on a growing North Sydney Central Business District (CBD). The proposal forms part of an integration development and aligns with:

- transit orientated development concept (identified in this report as an integrated station design); and
- the vision and direction set within Future Transport for the Eastern Harbour City concept through its proximity to the public transport network, utilisation of existing and planned infrastructure and assets, its contribution to the North Sydney skyline and its ability to deliver on a 30 minute city.

The southern portal site for Victoria Cross (refer **Figure 4**) is irregular in shape, has a total area of approximately 4,815 square metres and has street frontages of approximately 37 metres to Berry Street, 34 metres to Denison Street and 102 metres to Miller Street.

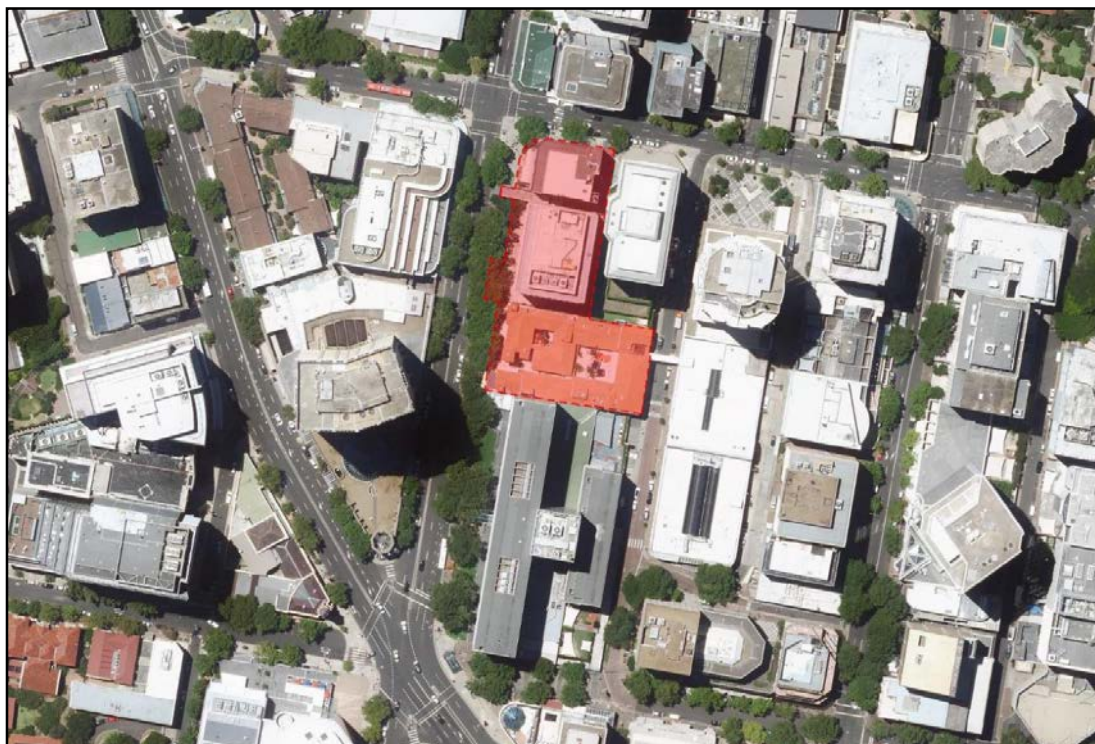


Figure 4: The Site

The site is located in North Sydney Centre in the North Sydney Local Government Area and forms part of the central core of the Eastern Harbour City. It is planned to be positioned above the proposed Sydney Metro Victoria Cross Station and within the existing North Sydney CBD. This enables the site to offer users facilities and services within easy walking distance together with fast frequent high quality transport connections to other key urban centres that are identified to support future growth. These include:

- Sydney CBD approximately 3km to the south.
- Chatswood approximately 5km to the northwest.
- St Leonards / Crows Nest approximately 2km to the northeast.

The site comprises the following properties:

- | | |
|-------------------------|---|
| • 155–167 Miller Street | SP 35644 (formerly Tower Square) |
| • 181 Miller Street | Lot 15 in DP 69345, Lot 1 & Lot 2 DP 123056
and Lot 10 in DP 70667 |
| • 187 Miller Street | Lot A in DP 160018 |

- 189 Miller Street Lot 1 in DP 633088
- Formerly part 65 Berry Street Lot 1 in DP 1230458

1.7 Overview of the proposed development

This concept SSD Application comprises the first stage of the Victoria Cross OSD project. It will be followed by a detailed SSD Application for the design and construction of the OSD to be lodged by the successful contractor who is awarded the contract to deliver the Integrated Station Development.

This concept SSD Application seeks approval for the planning and development framework and strategies to inform the future detailed design of the OSD. It specifically seeks approval for the following:

- A building envelope as illustrated in **Figure 5**
- A maximum building height of RL 230 or 168 metres (approximately 42 storeys, comprising of 40 commercial storeys and 2 additional storeys for the roof top plant) for the high rise portion of building envelope and RL 118 or 55 metres (approximately 13 storeys) for the high rise portion of building envelope and RL 118 or 55 metres (approximately 13 storeys) for the lower rise eastern portion of the building envelope
- A maximum gross floor area (GFA) of 60,000 square metres for the OSD component, which is equivalent to a floor space ratio of 12.46:1
- Use of the building envelope area for commercial premises including commercial office, retail and business premises
- Use of the conceptual OSD space provisioning within the footprint of the CSSI Approval (both above and below ground), including the OSD lobby and associated retail space, basement parking, end-of-trip facilities, services and back-of-house facilities
- Car parking for a maximum of 150 parking spaces over four basement levels with an additional 11 parking spaces allocated to the station retail approved under the terms of the CSSI Approval
- Loading, vehicle and pedestrian access arrangements from Denison Street
- Strategies for utility and services 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).

The total GFA for the Integrated Station Development including the station GFA (i.e. retail, station circulation and associated facilities) and the OSD GFA is 67,000 square metres and is equivalent to a FSR of 13.9:1.

A drawing illustrating the proposed building envelope is provided in **Figure 5**. The concept SSD Application includes an indicative design for the OSD to demonstrate one potential design solution within the proposed building envelope (refer to **Figure 6**).

Victoria Cross Station is to be a key station on the future Sydney Metro network, providing access to the growing North Sydney Central Business District (CBD). The proposal combines the Metro station with a significant commercial office tower, contributing to the North Sydney skyline. The OSD would assist in strengthening the role of North Sydney as a key component of Sydney's global economic arc and would contribute to the diversity, amenity and commercial sustainability of the CBD.

It is noted that Victoria Cross northern services building and new station entrance at Victoria Cross North do not form part of the concept SSD Application.

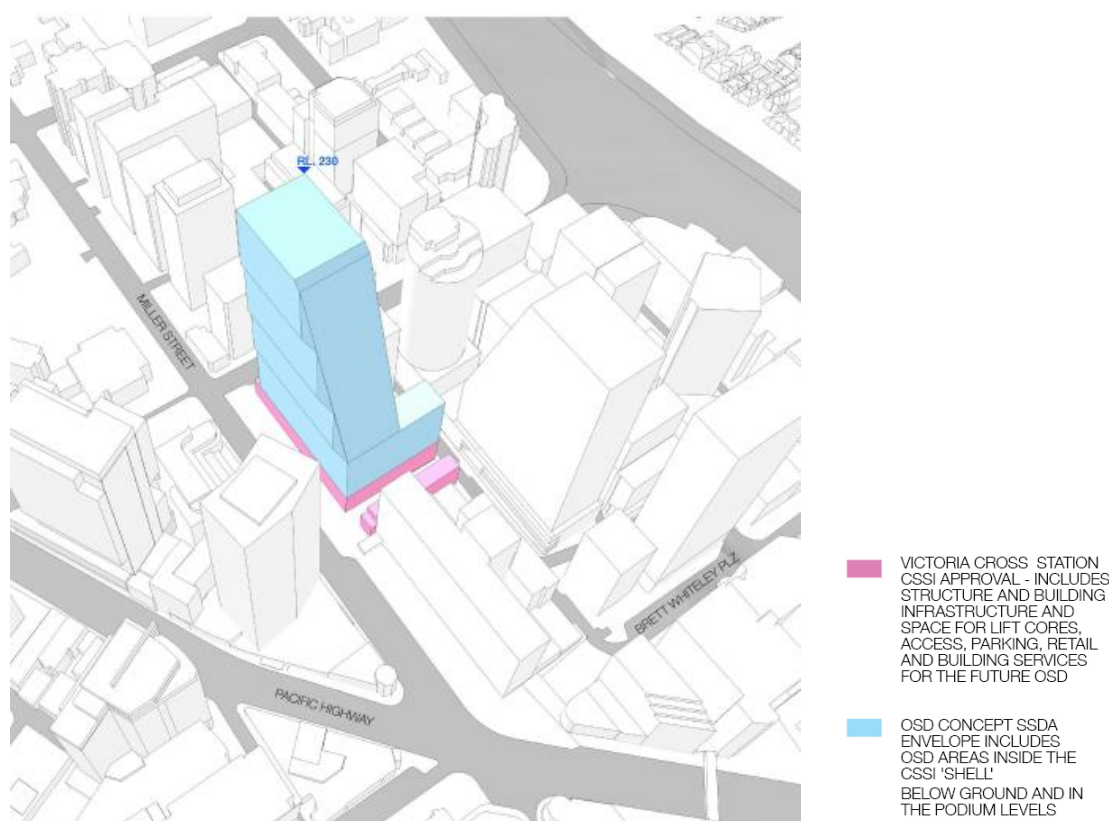


Figure 5: Proposed Victoria Cross OSD building envelope

Source: Bates Smart

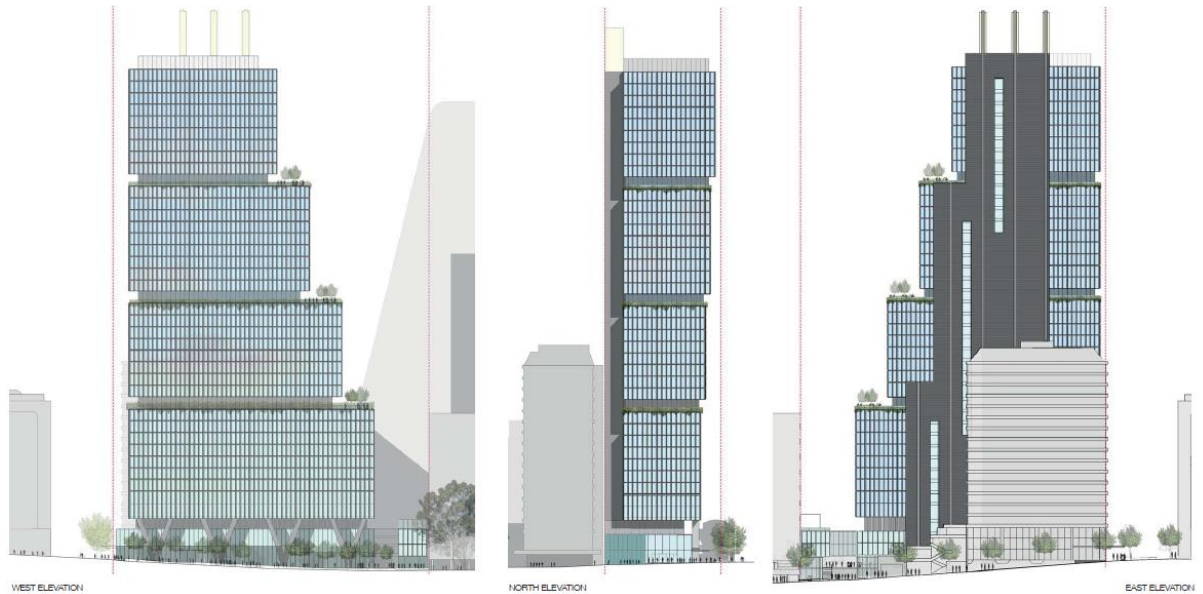


Figure 6: Victoria Cross Indicative OSD Design

Source: Bates Smart

2.0 Scope of assessment

This report is based on the OSD concept design drawings provided by TfNSW (thereafter referred to as the indicative OSD design). This report documents the traffic and transport impact assessment that has been undertaken for the OSD. 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, and also the cumulative impact of a number of proposed projects likely to impact surrounding network operations in the future.

Owing to the OSD's location above the CSSI approved Victoria Cross Station, a series of collaboration workshops have been undertaken with TfNSW's Stage 1 design Team (METRON) to coordinate the designs, identify challenges and propose solutions. This occurred as METRON advanced towards their Stage 1 design deliverable (approximately a 40% level of definition).

The assessment includes the traffic and transport assessment required to service the retail tenancies and the commercial floor space in the Indicative OSD design.

The assessment incorporated:

- Review of relevant legislation, policies and guidelines associated with traffic and transport;
- Consultation with TfNSW regarding traffic and pedestrian modelling, parking and servicing requirements for the station;
- Assessment of the forecast traffic and pedestrian impacts resulting from the operation of the proposed Indicative OSD design and retail concessions associated with the station; and
- Assessment of the car parking, access and service dock design layout illustrated in the Indicative OSD design.

3.0 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 North Sydney Local Environment Plan 2013 & North Sydney Development Control Plan 2013

The *North Sydney Local Environment Plan (LEP) 2013* is the principal legal document for controlling development and guiding planning decisions within the North Sydney Council area. The *North Sydney Development Control Plan 2013 (DCP)* provides guidance which supports the implementation of the LEP. Although the DCP is not applicable to the SSD, it provides a guide to the maximum number of on-site car parking spaces that can be provided for new developments based on their location and level of transport accessibility. It also recommends the minimum number of bicycle parking spaces to be provided by new developments.

3.2 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; and
- Whether the proposed development will encourage the increased use of public transport.

The proposed development is to be constructed above the entrance to Victoria Cross 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 to assess how the proposed OSD impacts these 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.

3.3 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. It 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 development is part of the Victoria Cross 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.

3.4 North District Plan

The Greater Sydney Regional Plan nominates six districts of Sydney, the district plans have been released by the Greater Sydney Commission (GSC).

The *North District Plan* (GSC, 2018) sets out priorities and actions for the North District, where the proposal is located. The vision includes strengthening the transport connections from North Sydney CBD to the Eastern Economic Corridor and the Harbour CBD and is illustrated in **Figure 7**.

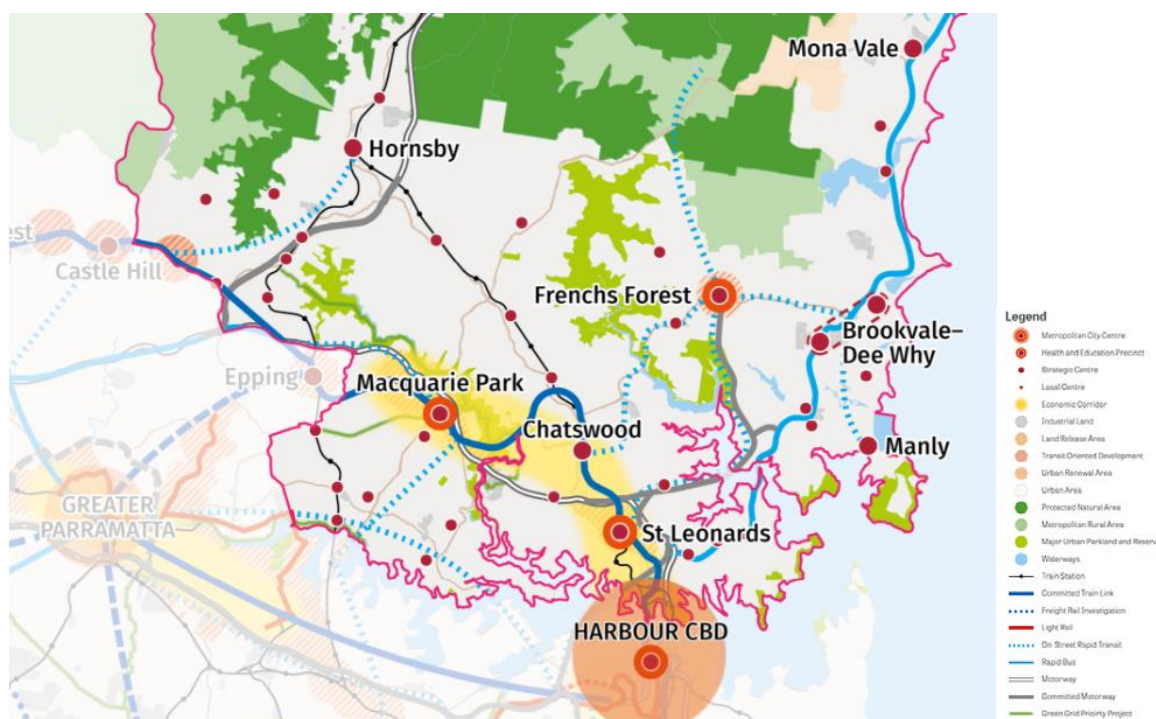


Figure 7: North District Plan

Source: Greater Sydney Commission, 2018

The introduction of the new Victoria Cross Station will help strengthen the transport connection from North Sydney CBD to the Eastern Economic Corridor and the Harbour CBD through more frequent and better connected rail services. The proposed OSD will provide a significant level of employment. Being located above the Victoria Cross Station, it will help expand the catchment of accessibility through non-car modes of travel by taking advantage of this important transport connection.

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

3.6 Sustainable Sydney 2030

The plan for Sydney moving forward is to become a green city, whilst 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.

3.7 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.

For North Sydney, the plan proposed that Local services will continue to run as peak expresses for commuters to the CBD, providing fast, reliable and convenient access from

inner Sydney suburbs such as North Sydney, Five Dock and Bondi Beach, supported by new bus priority.

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

3.9 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 North Sydney Council is moving towards a well-connected cycle network to improve accessibility for workers and visitors to the CBD. The development would encourage people to cycle by providing high quality end-of-trip facilities for employees and visitors.

3.10 Sydney Metro Planning Study – Crows Nest and North Sydney

In response to the introduction of Sydney Metro, North Sydney Council has prepared a planning study which aims to inform and guide the future planning and development of the Metro, including OSD on Metro sites and their immediate surroundings.

The study concludes that OSD on metro sites will contribute to the overall amenity of the North Sydney Centre, particularly with regard to provision of new commercial floor space in the North Sydney Centre commercial core and the creation of new public spaces facilitating a sense of place and identity. The implementation of OSD allows the incorporation of design excellence to create an exceptional built form, and improve the performance and capacity of the public domain in the vicinity of the site.

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
- North Sydney Council Development Control Plan (DCP) 2013
- North Sydney Council's Central Laneways Masterplan proposals exhibited during January 2018

4.0 Existing Conditions

4.1 Existing travel patterns

Travel data obtained from the Australian Bureau of Statistics (ABS) provides an insight into the Journey to Work (JTW) and household Travel Survey (HTS) characteristics of workers and residents of North Sydney respectively. This data is based off the 2011 Census data collected by the ABS.

The Bureau of Transport Statistics (BTS) derives the ABS data collected during the 2011 Census, which includes method of travel to work at a travel zone level. Travel zones 1951, 1952, 1953, 1954, 1955, 1956 and 1957 represent the immediate catchment area of Victoria Cross Station which is illustrated in **Figure 8**.

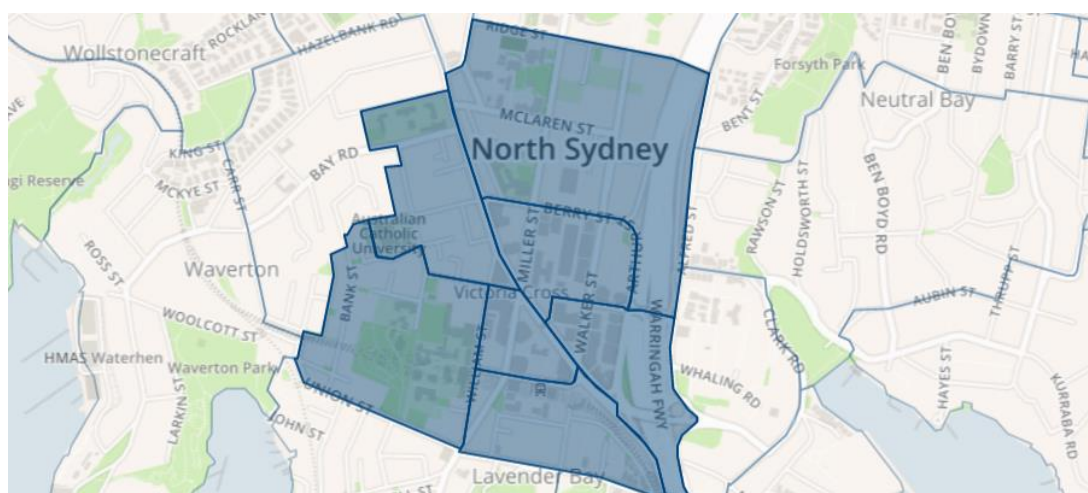


Figure 8: Location of Travel Zones 1951, 1952, 1953, 1954, 1955, 1956 and 1957

Source – NSW Bureau of Transport Statistics, 2017

4.1.1 Journey to Work (JTW)

Table 1 presents the following travel characteristics for the 39,511 people who work in these travel zones and indicates:

- The current high proportion of journey to work trips that are made by train, which highlights that approximately 47 per cent of trips are attributable to this mode.
- A total public transport mode share of 59 per cent, which is significantly greater than the Greater Sydney average of 20 per cent and similar to other highly accessible Eastern Harbour City localities.

- A high proportion of private vehicle trips for a CBD location, which currently represents 31 per cent of trips to the area.

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 North Sydney and public transport catchments and parking provision and management of long-term parking demand in the CBD.

In addition to the data for North Sydney the analysis also benchmarks against other highly accessible locations situated in the Eastern Harbour City that is influenced by parking controls, congestion along the road network, high density mix used environments and high public transport accessibility and service levels. This information is presented in **Table 1** for travel zones that represent the Pitt Street and Martin Place catchment areas. The ABS data indicates that Pitt Street and Martin Place display mode share travel trends that generate 7-9 per cent higher trips by public transport and approximately 17 per cent lower car trips.

Table 1: Journey to work mode share for workers near Victoria Cross Station

Source: BTS, based on 2011 Census

	Eastern Harbour City			
Mode of travel	North Sydney	Pitt Street	Martin Place	Greater Sydney
Train	17,157 (47%)	47%	42%	14%
Bus	4,250 (12%)	21%	22%	6%
Car (driver)	10,376 (28%)	14%	15%	67%
Car (passenger)	1,130 (3%)			5%
Walked only	2,283 (6%)	6%	6%	4%
Mode not stated	424 (1%)	11%	11%	2%
Other (including bicycle)	1,039 (3%)			2%

Note: Excludes those who did not go to work

The construction and opening of the Sydney Metro City and Southwest (C&SW) line (including Victoria Cross Station), together with the further intensification of North Sydney CBD and the planned intensification of centres situated along the Sydney Metro C&SW project alignment, may support a mode share comparable to Pitt Street or Martin Place. This would see a reduction in the proportion of private vehicle generated trips and an increase in the public / active transport mode share for North Sydney in the future.

4.1.2 Household travel survey

The Household Travel Survey highlights travel trends for residents of the catchment, which is based on a survey of 2,179 people. **Figure 9** illustrates the data set and indicates a high public transport (trains and buses) mode share at 43 per cent with private vehicle representing 29 per cent of all trips. Due to the proximity of the residential area to services and employment the walk only mode is higher at 24 per cent and will be further influenced by the continued intensification of North Sydney CBD and Crows Nest and St Leonards precincts.

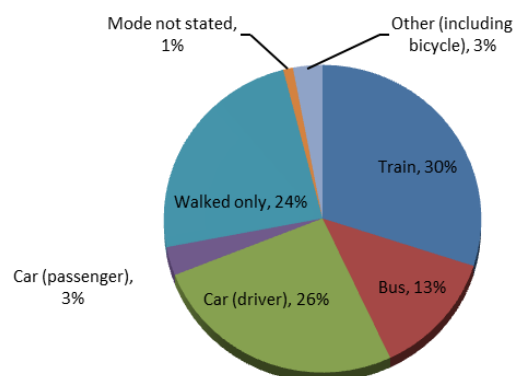


Figure 9: North Sydney residents' mode choice split

Source – NSW Transport Performance and Analytics, 2011

In addition to the above, the latest journey to work data generated from the 2016 Census data for centrally based local areas in City of Sydney and North Sydney LGA was also reviewed (source - <https://profile.id.com.au>).

The review highlighted that the origin and destination of trips and the quality of travel choices by mode influences how people travel. The data reviewed as part of this assessment highlights that travel mode choice is influenced by proximity to transit options and the quality of its offering together with controls on parking. The data also highlights that North Sydney has a relationship with Sydney inner city (37% of trips), North Sydney/Mosman (33% of trips), Chatswood/Lane Cove (10% of trips), and Ryde/Hunters Hill (4% of trips), which in total represent 84% of trips generated into North Sydney. All of the above origins appear to offer train, bus and active transport options for access to North Sydney.

Another trend that was identified from the review of data was that whilst the public transport mode share and proportion of people living and working in the LGA was similar, the difference was a lower dependency on private vehicle for access in the City of Sydney and a higher dependency on walking and cycling. The review of the 2011 census data against the 2016 census data highlighted that the proportion of trips made by private vehicle trips in both North Sydney and the City of Sydney is reducing and travel by rail, and in most cases, walking is increasing in total and as a proportion of total journey to work trips.

This general trend was plotted for land use and highlights a high public transport mode share around existing rail station nodes, as illustrated in **Figure 10**. It is also noted that the area that will accommodate both the Victoria Cross Station and OSD already presents a trend for high public transport travel for journey to work purposes.

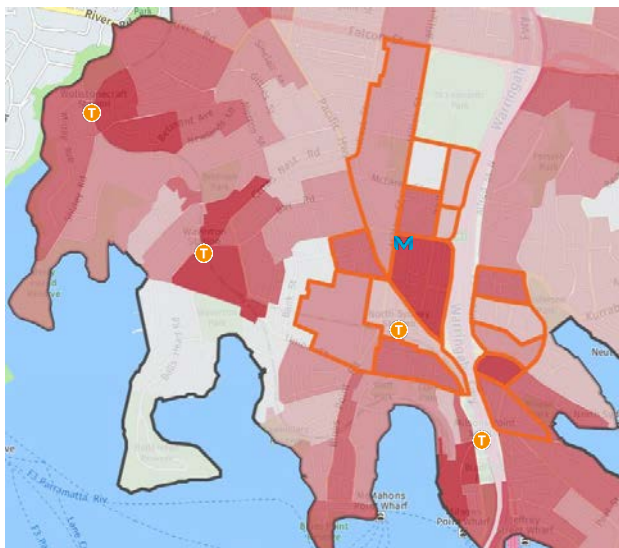


Figure 10: Households travel to work by public transport

Source: Social Atlas North Sydney Council, 2017

4.1.3 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 illustrated in **Figure 11** 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; and

- Reduced parking provision and strengthening of parking management in CBD locations.

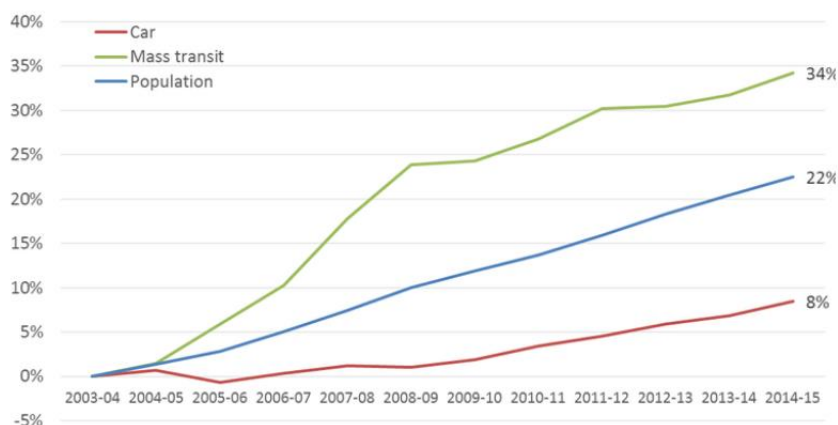


Figure 11: Growth in car and mass transit passenger km in Australia's five largest cities

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

4.2 Road network

The key roads in the vicinity of the study area include Miller Street, Berry Street, Walker Street and Pacific Highway.

Miller Street provides a north-south connection from North Sydney to Northbridge. It continues as Blues Point Road to the south and Strathallen Avenue to the north. The section located near the proposed Victoria Cross Station is classified as a regional road.

In its physical form, the road has in most locations through the CBD, two lanes in each direction, with the kerbside lane subject to time restricted parking and ancillary turning lane provision at some key intersections. The area adjacent to the site is currently designated and signposted as a high pedestrian activity zone, with a speed limit of 40 kilometres per hour. Travel along Miller Street is also impacted by a school zone that operates to the north of Berry Street and supports school pick up and drop off periods during a typical weekday.

Berry Street is classified as a state road east of the intersection with the Pacific Highway and follows an east-west alignment. It offers a three and four traffic lane configuration that operates in an eastbound direction only. The kerbside lanes are subject to time restricted parking. East of Walker Street, it joins Arthur Street and offers connections to the M1 Motorway and Sydney Harbour Bridge. For the majority of its length Berry Street is designated as a 40 kilometres per hour speed zone.

Walker Street is a local road which runs parallel to Miller Street, with a north-south alignment. It is located between Pacific Highway to the south and Ridge Street to the north. The road allows for two-way traffic, generally providing one traffic lane in each direction and permits time restricted parking in the kerbside lanes. The designated speed limit through the

CBD is 40 kilometres per hour and between McLaren Street and Ridge Street it also accommodates a sign posted 40 kilometres per hour school zone that operates during school pick-up and drop-off times only.

Pacific Highway is a state road which provides a key north-south link from the Pacific Motorway to North Sydney. In the vicinity of Victoria Cross Station, the road generally provides three lanes in each direction and facilitates access to the North Sydney CBD, Blues Point and Milson Point together with Falcon Street, River Road, Sydney Harbour Bridge and the Warringah Freeway. The kerbside lane has time limited parking and is subject to clearway restrictions and operates with a sign-posted speed limit of 60 kilometres per hour.

4.3 Site vehicular access

Vehicle access to car parks and loading docks for previously approved development on the site (pre-demolition undertaken under CSSI Approval) was available via Denison Street only. Denison Street is a one-way road, with on-street parking and loading and northbound movements. As such, vehicle access from the north would travel via Berry Street, Little Spring Street or Spring Street to gain access to the northbound one-way section of Denison Street. For vehicles wanting to access the site from the south, vehicles would travel via Walker Street and Spring Street. **Figure 12** illustrates the vehicular access route for the site as it currently exists. Also note that Denison Street between Mount Street and Spring Street operates as a one-way road in a southbound direction.

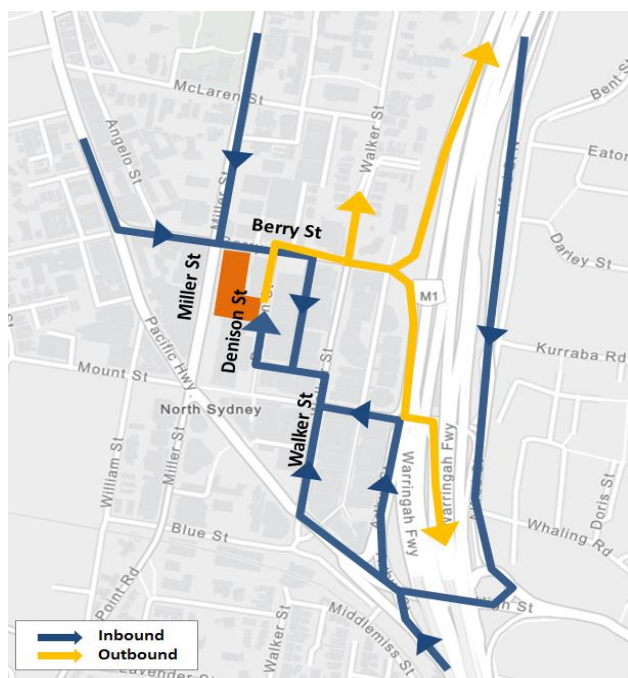


Figure 12: Site vehicular circulation (existing road network)

Source: AECOM 2017

4.4 Traffic conditions

Traffic surveys near the site were undertaken in 2015 and are presented in **Table 2**. Generally, traffic volumes during the PM peak period tend to be lower than in the AM peak period, and traffic volumes in the southbound direction on the Pacific Highway between Berry Street and Miller Street are noticeably lower than between McLaren Street and Berry Street. This is due to a large left turn movement onto Berry Street, which provides access to the Warringah Freeway, Military Road and Sydney Harbour Bridge.

Peak hour traffic volumes along Miller Street to the north and south of the site are generally significantly lower than both Berry Street and the Pacific Highway sections. The section between Berry Street and the Pacific Highway currently operates as a high frequency bus service route through the North Sydney CBD.

Walker Street experiences a strong demand in the northbound direction with 1,170 vehicles per hour in the AM peak and 940 vehicles per hour in the PM peak. In comparison, the southbound direction only receives 160 vehicles per hour in the AM and 100 vehicles per hour in the PM. This change in traffic volumes is likely to be influenced by vehicles seeking to use the Warringah Freeway and Sydney Harbour Bridge via Arthur Street to travel north or south of the CBD.

Table 2: Victoria Cross 2015 peak hour traffic volumes

Source: CSSI Chatswood to Sydenham EIS, 2016

Location	Direction	AM (veh/h)	Peak (veh/h)	PM Peak (veh/h)
Pacific Highway – between McLaren Street and Berry Street	Southbound	1,390		1,060
	Northbound	1,000		790
Pacific Highway – between Berry Street and Miller Street	Southbound	520		620
	Northbound	1,210		1,160
Miller Street – between McLaren Street and Berry Street	Southbound	630		530
	Northbound	470		500
Miller Street – between Berry Street and Pacific Highway	Southbound	540		370
	Northbound	550		640
McLaren Street – between Pacific	Eastbound	240		190

Location	Direction	AM (veh/h)	Peak PM Peak (veh/h)
Highway and Miller Street	Westbound	290	250
Berry Street – between Pacific Highway and Miller Street	Eastbound	1,220	940
Berry Street – between Miller Street and Walker Street (including Denison Street intersection)	Eastbound	1,280	1,700
Walker Street – between Arthur Street and Mount Street	Southbound	160	100
	Northbound	1,170	940

4.5 Intersection performance

SCATS data extracted by RMS for Wednesday 7 December 2016 was used by the Design Team to assess the intersection performance at key intersections surrounding the site. The intersection performance was evaluated using SIDRA Intersection 7.0, a computer-based modelling package designed for calculating isolated intersection performance. The performance indicators for SIDRA 7.0 applicable to the project are:

- Degree of Saturation (DoS) – measure of the ratio between traffic volumes and capacity of the intersection is used to measure the performance of isolated intersections. As DoS approaches 1.0, both queue length and delays increase rapidly. Satisfactory operations usually occur with DoS of less than 0.90.
- Average Delay – duration, in seconds, of the average vehicle waiting at an intersection, which corresponds to the Level of Service (LoS) – a measure of the overall performance of the intersection.

Intersection performance criteria are presented below in **Table 3**.

Table 3: Level of Service criteria for intersections

Source: *Guide to Traffic Generating Developments, RTA, 2002*

Level of Service	Average Delay (secs/veh)	Traffic Signals, Roundabouts	Give Way and Stop Signs
A	Less than 14	Good Operation	Good Operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity

Level of Service	Average Delay (secs/veh)	Traffic Signals, Roundabouts	Give Way and Stop Signs
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays	At capacity; requires other control mode
F	>70	Roundabouts require other control mode	At capacity; requires other control mode

An overview of the existing performance for intersections near the proposed Victoria Cross Station is presented in **Table 4**. The assessment found that all intersections analysed are currently operating at LoS C or better and with a degree of saturation of less than 0.90 during both the AM and PM peak periods.

Table 4: Existing intersection performance

Source: CSSI Chatswood to Sydenham EIS, 2016

Intersection	DoS	LoS	Average Delay (s)	95% Back of Queue (m)
AM				
Miller Street / Pacific Hwy	0.622	C	29	104.9
Berry Street / Pacific Hwy	0.82	B	14.7	134.5
Miller Street / Berry Street	0.741	C	37.7	138.4
Berry Street / Denison Street*	0.106	A	6.7	2.8
Berry Street / Walker Street	0.896	C	32	255.1
Miller St / McLaren Street	0.567	B	23.6	92.4
PM				
Miller Street / Pacific Hwy	0.518	C	30.2	85.2
Berry Street / Pacific Hwy	0.781	A	12.1	107
Miller Street / Berry Street	0.721	C	29.9	140.6
Berry Street / Denison Street*	0.293	A	7.4	5.8
Berry Street / Walker Street	0.873	C	32.2	185.2

Miller St / McLaren Street	0.693	B	21.8	82.2
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Notes: * Priority intersection, worst movement reported

The data also highlights significant queuing on certain approaches, which is generally associated with the following intersections:

- Berry Street and Miller Street
- Berry Street and Walker Street
- Berry Street and the Pacific Highway

4.6 Off Street parking and servicing

Prior to the demolition of the existing buildings on the Victoria Cross OSD site, access to loading areas and car park driveways was provided from Denison Street. The access arrangements included three separate access driveways to a number of car parking spaces located beneath the previously approved buildings and a service area for deliveries, as presented in **Table 5**.

The below lots make up the proposed OSD site, all of the lots were serviced by a loading dock located within the access driveway of 181 Miller Street and accessed from Denison Street.

Table 5: Previously Approved On-site Parking Allocation

Source: AECOM analysis

Address	Car Parking Spaces
155 Miller Street	65
181 Miller Street (Wilson Car Park)	128
187 Miller Street	-
189 Miller Street	15
Total	208

4.7 On-street parking

The on-street kerbside parking controls along Miller Street and Berry Street includes areas allocated for time restricted metered parking spaces, bus zones and loading zones. Clearways are also in effect along both streets to facilitate peak commuter traffic flows during typical weekdays.

A site visit and review of Council documentation highlighted that time restricted metered parking was also permitted along Denison Street, and this area is now subject to a Council initiative (proposed precinct enhancement project). These changes together with surrounding approved and proposed development (including the station) are expected to change the role and function of this CBD road link in terms of the direction of traffic movements and traffic / pedestrians activity.

Observation highlighted that kerbside private vehicle parking is heavily utilised and managed through time restrictions on most CBD roads. Kerbside activity is managed through changing time restrictions, which is dependent upon the day of week, time of day and the associated land use activities.

4.8 Public transport access

The proposed OSD is located within walking distance of existing major bus stops, North Sydney Station, and taxi zones, and situated above the proposed Victoria Cross Station.

Figure 13 illustrates the location of the existing public transport facilities in relation to the site.



Figure 13: Victoria Cross existing public transport and cycle routes

Source: CSSI Chatswood to Sydenham EIS, 2016

4.8.1 Train services

According to *Train Statistics 2014 Everything you need to know about Sydney Trains and NSW Train Link* (BTS,2014), North Sydney station is the fifth busiest station in Sydney with 1,961 entries and 17,541 exits recorded for 3.5 hours during the AM peak period.

The station is located on Blue Street and has an underground pedestrian link to an adjacent development (Greenwood Plaza) that provides a number through connection options that cross Pacific Highway to both Miller Street and Denison Street. The train lines servicing North Sydney Station are as follows:

T1 – North Shore and Northern Line (City to Berowra via Gordon, City to Hornsby via Macquarie University). This line runs between Berowra/Hornsby and Penrith/Richmond servicing stations in the norther shore (i.e. St Leonards and Chatswood), inner west (i.e.

Burwood and Strathfield) and the western Sydney region (i.e. Penrith, Parramatta and Strathfield).

- **T1 – Northern Line** (Epping to City via Strathfield and return). This line runs between Epping and Chatswood via Strathfield, servicing stations in the north shore (stations include St Leonards and Chatswood) and northern suburbs (stations include Eastwood and Epping).
- **T1 – Western Line** (Emu Plains or Richmond to City and return). This line runs between Emu Plains/Richmond and Chatswood/North Sydney.
- **T6 – Carlingford Line** (Carlingford to Clyde and return).
- **Central Coast and Newcastle Line** (intercity services).

Note that the T1-North Shore and Northern Line may continue its service as T1-Northern or T1-Western line, and the same applies with their return trips.

The T6 Carlingford Line only services North Sydney Station outside of the peak periods, between the hours of 10pm – 1am only.

Table 6 below presents the frequency of services of the train services departing from North Sydney as extracted from the Sydney Trains timetable.

Table 6: Sydney Trains - Existing Services in North Sydney Station

Source: Sydney Train's timetables

Start	End	T1 Line		Central Coast and Newcastle Line	
		City bound	Chatswood Bound	Town Hall Bound	Newcastle Bound
6:00	7:00	11	12	0	0
7:00	8:00	13	15	2	0
8:00	9:00	16	20	4	0
15:00	16:00	14	12	0	0
16:00	17:00	17	15	0	2
17:00	18:00	20	16	0	4
18:00	19:00	14	14	0	0

Note¹: continued service from T1-North Shore Line

Note²: continues as T1-North Shore Line

At its peak (at 8am-9am), North Sydney Station is serviced by a total of 40 train services with 20 travelling northbound and 20 travelling southbound. This equates to an average train service frequency every three minutes in each direction.

4.8.2 Buses

North Sydney is a major bus thoroughfare with over 40 bus routes stopping in the area. Major bus stops include those along Miller Street, Blue Street and Pacific Highway. **Figure 14** illustrates the bus routes and their respective service corridors that operate via, or originate and terminate from/to North Sydney.

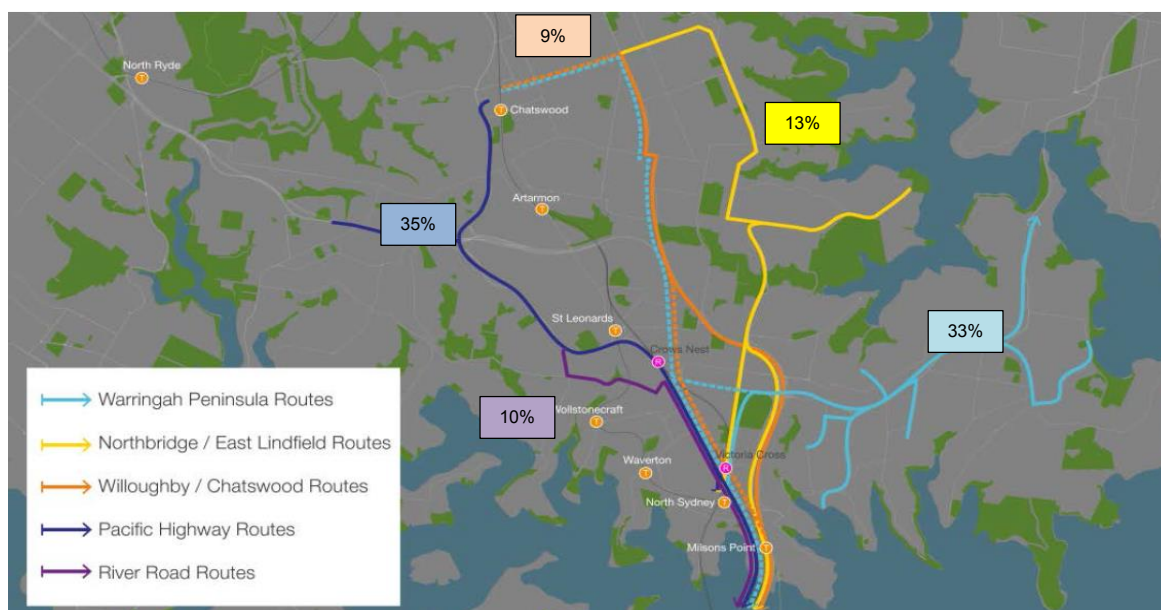


Figure 14: North Sydney bus routes

Source: Transport for New South Wales, 2018

The location of the proposed OSD is within the vicinity of these existing major bus routes and stops on Miller Street between Berry Street and the Pacific Highway. There are two northbound (stop #206046 and 206045) and two southbound (stop #206085 and 206052) bus stops identified along this section of Miller Street. The timetables at these bus stops have been assessed and are summarised below.

- During the morning peak periods (8am-9am) a combination of 23 and 89 buses service the northbound and southbound bus stops respectively.
- In the afternoon peak periods (3pm-4pm) a combination of 48 and 28 buses service the northbound and southbound bus stops respectively.

Based on the assessment of the existing bus services, it was found that Miller Street facilitates high bus service frequencies to/from North Sydney to major bus corridors illustrated in **Figure 14**. The bus service frequency level indicates that the accessibility of the site by bus is highly desirable based on current timetabled services. This is likely to equate to a bus service frequency every 10 minutes or better on most key service corridor routes illustrated in **Figure 14**.

The introduction of the Beaches Link and Sydney Metro services to North Sydney is likely to result in some level of change to the bus network, including a potential reduction in Northwest Sydney bus services that duplicate the Sydney Metro line. All other changes are likely to be minimal and may result in some bus volume increases to accommodate expected future growth in centres and along key bus corridors.

4.8.3 Taxi

Taxi ranks are located within the immediate vicinity of the proposed development with designated zone identified in the following locations:

- **Berry Street** – on the southern kerbside of Berry Street between Little Spring Street and Denison Street.

There are four parking bays that are used as taxi zones between 3pm-10pm on Monday to Friday and 7am-6pm on weekends. Outside of these hours, 1-hour parking restrictions apply between 10am-3pm and unrestricted at any other times.

- **Miller Street** – one full time taxi zone currently exist on the eastern kerbside of Miller Street, immediately south of Berry Street and adjacent to the station entry.

Two taxi zones are also available on the southern kerbside of Blue Street, east of the access to the North Sydney Station. This demonstrates that the site can offer convenient access by taxi.

4.8.4 Pedestrian access

The main pedestrian access points to the existing buildings (pre-demolition) are presented in **Table 7**.

Table 7: Existing pedestrian access points

Source: AECOM analysis

Address	Primary Pedestrian Access Points
155 Miller Street	Miller Street and Denison Street
181 Miller Street	Miller Street
187 Miller Street	Miller Street
189 Miller Street	Miller Street and Berry Street

North Sydney contains a number of medium to high density residential units and commercial offices. Historical development in North Sydney offers good levels of access to both public transport and off and on- street parking provision.

Improvements and continued increases in the public transport service offering, particularly in the form of rail services and the congestion levels experienced on the road network has resulted in North Sydney's centre experiencing high pedestrian density levels and demand. During peak periods, the centre's pedestrian crossings can become congested, which is driven by outdated designs and treatments that don't offer the priority and spatial allocation for pedestrians.

Other than the commercial buildings, key pedestrian attractors in the area include North Sydney Station, Greenwood Plaza, Miller, Walker and Mount Streets, and the educational establishments and recreational areas to the west of Pacific Highway and to the north on Miller Street.

North 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 North Sydney Centre. This will help to support place making activities that should support a North Sydney Centre economy.

4.9 Cycling network

Marked on-road cycle routes run along Miller Street, Berry Street, Mount Street and Pacific Highway (bus lanes). Sections of footpath along Pacific Highway have also been designated as shared paths. A detailed 2012 cycle map from the North Sydney Council website is presented in **Figure 15**. As seen, a marked cycle path runs in front of the proposed development, along Miller Street.

Council and RMS have also undertaken a number of studies to help improve the quality of cycling connections to North Sydney. These studies highlight that West Street, Ridge Street and Miller Street or Pacific Highway are key cycling routes and are a focus for future enhancements.

Additionally, bicycle parking facilities such as O-rings, rails and enclosed lockers have been provided nearby for cyclists. Use of the secure enclosed lockers available on Mount Street is subject to Council approval. As there is a waiting list of people seeking to use these lockers, this indicates that the demand for cycling is currently higher than facility provision for secure cycling facilities. The North Sydney Council Development Control Plan (DCP) requires new development to make provision for secure bike facilities and end-of-trip facilities, which is expected to address this current deficiency over time.

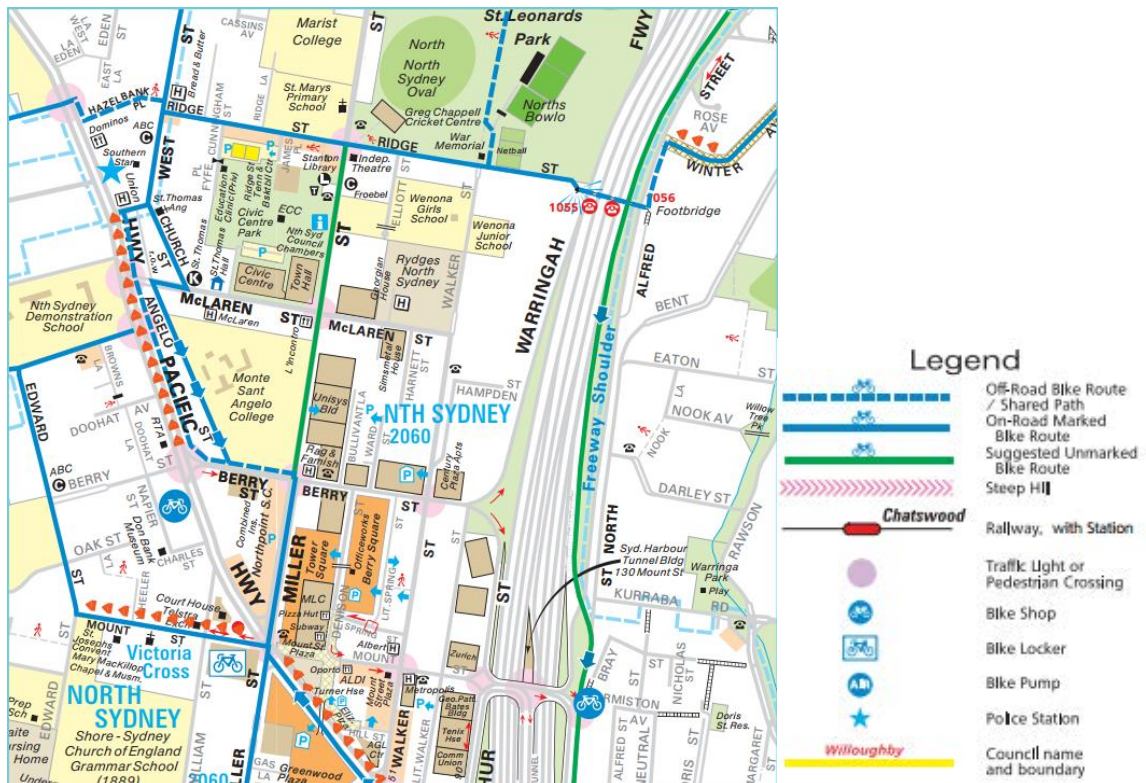


Figure 15: North Sydney cycling map 2012

Source: www.sydneycycleways.net - 2018

5.0 Servicing and parking provision review

5.1 Description

The concept SSD Application proposes a development with a total gross floor area (GFA) of 60,000m² accommodating commercial land uses. As indicated in **section 3.0** of this report, the total GFA for the Integrated Station Development including the station GFA (i.e. retail, station circulation and associated facilities) and the OSD GFA is 67,000 square metres.

The CSSI Approval includes 7,000 square metres of GFA, of which 4,500 square metres is attributed to station retail. For the purposes of understanding the likely parking and trip generation rates from the Integrated Station Development (i.e. as a result of the total development of the site), the GFA approved in the CSSI has been included 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

The proposed development would provide an appropriate number of car parking spaces in accordance with the DCP. The DCP 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.

The DCP provides car parking rates for non-residential development on land zoned B4 – Mixed Use in The North Sydney Centre, which captures the site and both the proposed commercial and retail uses. **Table 8** presents the required maximum number of parking spaces allowed under the DCP and highlights the proposed parking provision to support both retail (CSSI approved) and commercial (concept proposal) activities.

Table 8: Car parking space provision

Source: North Sydney Council DCP 2013- Part B

Land Use	North Sydney Council DCP 2013			Proposal Spaces
	Rate (B4 – Mixed Use, North Sydney)	Yield	Upper limit of parking space	
Car parking	1 space / 400m ² GFA	Total- 64,500m ² GFA comprising: - OSD: 60,000m ² - Station retail: 4,500m ²	OSD: 150 Station retail: 11	161
Disabled parking	1 space / 100 car parking spaces [^]	161 spaces	2 (inclusive of above)	

The data indicates that the proposed provision satisfies the requirements set under the DCP. The proposal aims to provide the maximum parking provision for the site of 161 car parking spaces, which includes provision for two accessible parking spaces.

It should be noted that the proposed 161 parking spaces is a reduction of 47 spaces from that previously permitted for the site. The designation of the maximum allocation will allow for future reduction (if required) due to design challenges, the future allocation of areas for additional accessible parking provision, courier spaces or/and community car sharing schemes.

5.3 Bicycle parking

The DCP also provides minimum bicycle parking and end-of-trip facilities rates for a variety of different uses. The number of bicycle parking spaces and end-of-trip facilities required based on the DCP is presented in **Table 9**.

Table 9: Bicycle parking space provision

Source: North Sydney Council DCP 2013- Part B

Land Use	North Sydney Council DCP 2013					Proposed Spaces
	Rate		Office Spaces	Retail Spaces	Required Spaces	
	Office Use – 59,500m ²	Retail Use – 5,000m ² (including 500m ² of OSD retail)				
Bicycle parking – occupants	1 space / 150m ² GFA	1 space / 25m ² GFA	397	200	798	802
Bicycle parking – visitors	1 space / 400m ² GFA	2+1 space / 100m ² GFA	149	2+50		
Bicycle Lockers	1 Personal Locker for each parking space		798		798	802
Showers and Change Cubicles	2 Shower and change cubicles for 11 – 20 or more bicycle spaces + 2 shower and change cubicles for each additional 20 bicycle parking spaces		80		80	82

Note – North Sydney Council requires bicycle parking spaces for occupants to be provided in the form of Class 2 spaces, and Class 3 spaces for visitors.

As presented above, the development is required to provide a minimum of 587 bicycle parking spaces for occupants and 201 bicycle parking spaces for visitors of the commercial and retail tenancies. In response, the development proposes to provide 802 bicycle parking spaces and therefore exceeds the minimum requirement as per Councils DCP.

The bicycle parking spaces are being provided as bicycle racks, within a secure site within the basement car park. The Indicative OSD Design illustrates how these requirements can be accommodated in the basement of the building. Although the bicycle parking is not provided in its own separate enclosure, this arrangement is deemed acceptable as the site is secure, covered and would be monitored by CCTV, which are the requirements of class 2 bicycle parking spaces.

5.4 Vehicular and bicycle access

The concept SSD Application proposes to provide vehicle and bicycle access for the OSD and station retail via the driveway access off Denison Street which forms part of the CSSI Approval. The final design of the access point will allow vehicles to enter via the current one-way northbound movement on Denison Street and will also accommodate any future changes to traffic operations that would require access to be gained via a southbound movement (North Sydney Council laneways proposal). The driveway itself will be designed in accordance to AS2890.1 and provide access to car parking levels situated in basement levels of the development (CSSI Approval) via a two-lane, two-way ramp that will be designed to connect to Denison Street driveway.

Access by more experienced cyclists is expected to occur via the car park vehicle access ramp. Together with the proposed loading dock on upper basement levels, these access arrangements will need to be carefully considered as part of the detailed site planning and design resolution in order to manage potential conflict and promote awareness of the different users passing through these areas.

Two lifts situated off the internal pedestrian connection on the proposed Denison Street level of the building (CSSI Approval) will provide the pedestrian and primary cyclist access to car and bike parking in the basement levels. These lifts can also be accessed from the Miller Street ground floor pedestrian link entry that also serves as a station access. Cyclist entering via these pedestrian links will dismount before travelling along the footpath and internal pedestrian links.

The proposed car, bicycle, pedestrian and servicing arrangements are illustrated in **Figure 16** to **Figure 19**. The Figures also show the paid pedestrian links connecting the Metro station concourse with the Metro station platforms.

The proposal will consolidate the three separate access driveways on Denison Street that previously served the site. This will help to reduce the number of conflict points on Denison

Street, support a safer pedestrian environment and help to facilitate future streetscape enhancements proposed as part of the Council initiative.

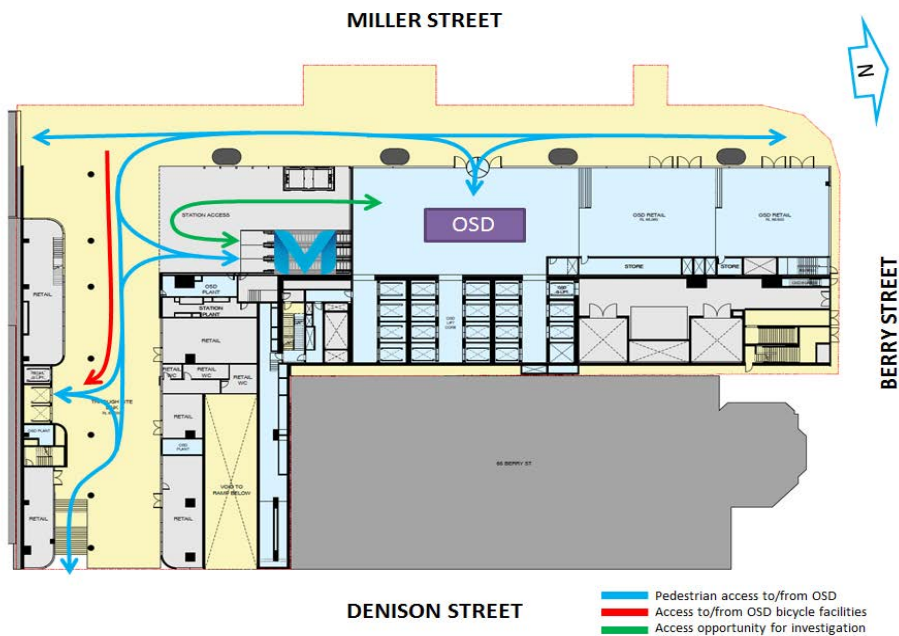


Figure 16: Ground Level - Miller Street Access

Source: Bates Smart, AECOM analysis

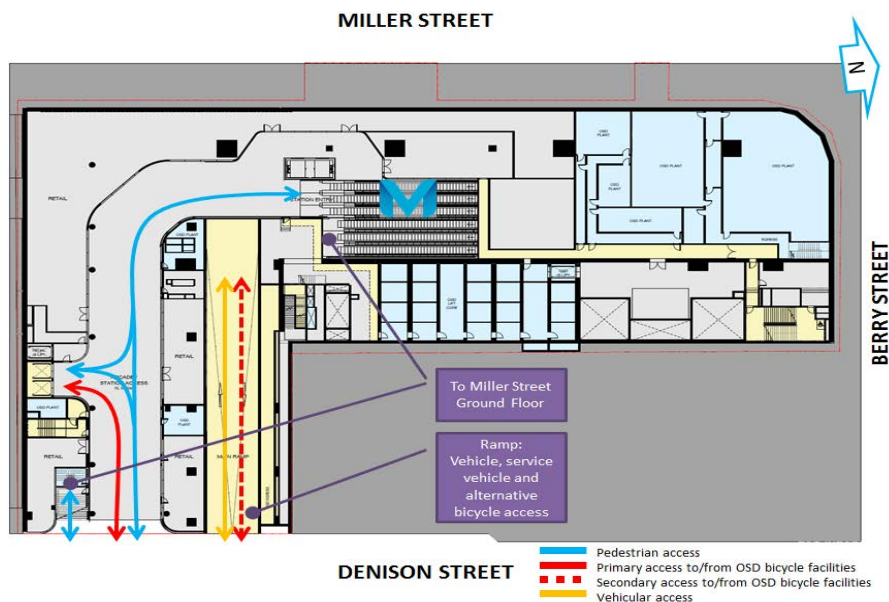


Figure 17: Lower Ground Level - Denison Street access

Source: Bates Smart, AECOM analysis

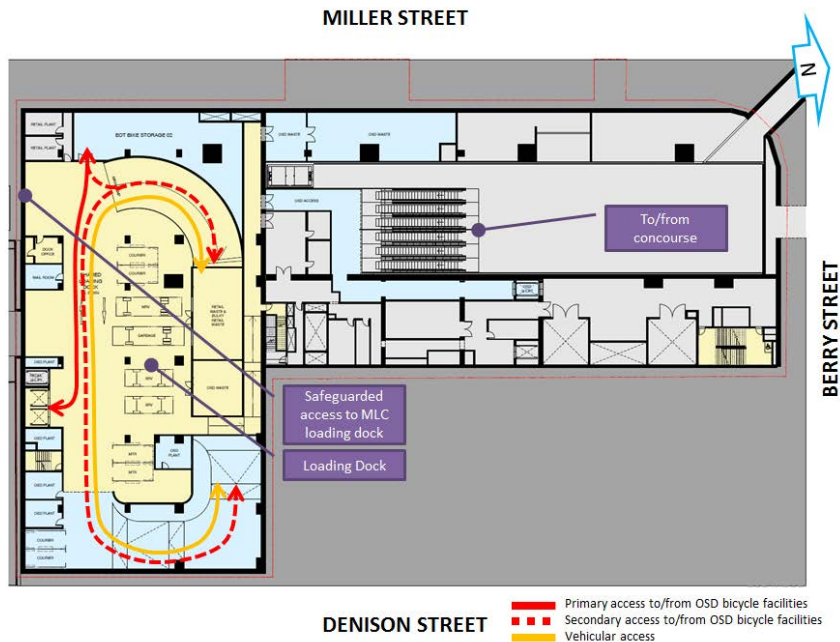


Figure 18: Basement Level 1 – Loading Dock and Bike Parking Facilities

Source: Bates Smart, AECOM analysis

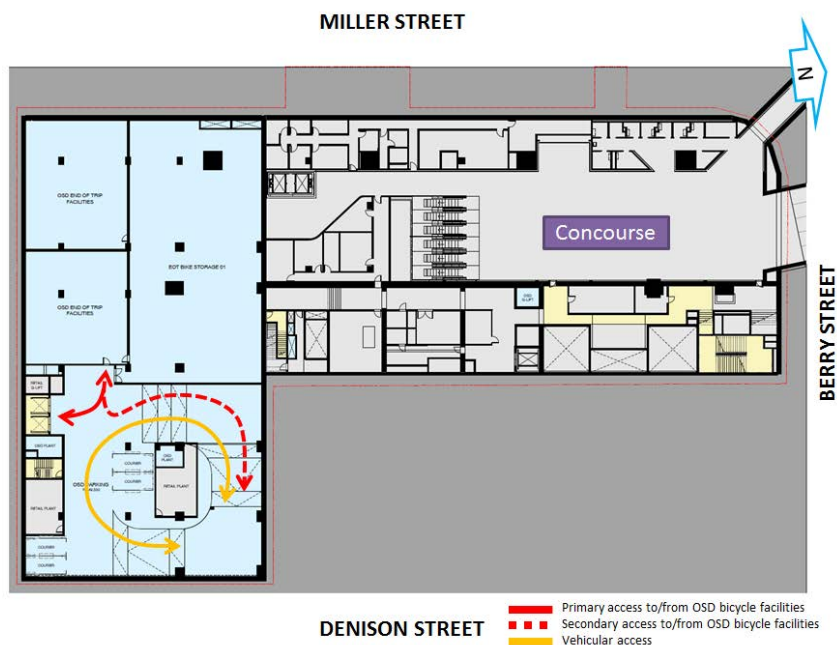


Figure 19: Basement Level 2 – Bike Parking Facilities (area 2)

Source: Bates Smart, AECOM analysis

5.5 Loading dock

The loading dock and servicing facilities will be designed to be situated on Basement Level 1. The access to the loading dock is via the proposed driveway and two-way access ramp off Denison Street and will be shared with vehicles entering and exiting the car park on the lower basement levels (refer to **Section 5.4**) and some experienced cyclists.

The number of service bays required is not specified within the North Sydney Council DCP, and therefore cannot be used to demonstrate compliance or adequate service dock provision. As a result, an alternative approach was adopted, which compared service bay provision for the recently approved commercial development at 1 Denison Street, North Sydney. The servicing provision compares favourably with the neighbouring 1 Denison Street development, which will accommodate:

- 2 Medium Rigid Vehicle (MRV) spaces
- 2 Small Rigid Vehicle (SRV) spaces
- 6 Courier/Van spaces
- 7 broadcast vehicle parking spaces in the loading dock.

The 1 Denison Street development, a 64,712 m² commercial use with some retail outlets on the ground floor levels, will be home to Channel 9 and as a result, required additional specialist parking spaces in the loading dock level to service its media function. This specialist function is not required for the proposed OSD and as a result, will not form part of the loading dock provision.

The Metro station and OSD propose to provide similar servicing provision to that approved for the 1 Denison Street development, which has been used as the basis for the assessment of the loading dock provision. The Indicative OSD design proposes a single loading dock accommodating:

- 2 Medium Rigid Vehicle (MRV) spaces;
- 2 Small Rigid Vehicle (SRV) spaces;
- 2 van spaces designated for the Victoria Cross Station for maintenance and operational purposes; and
- 6 Courier / Van spaces.

The assessment of the loading dock operation and forecast demand is provided in **Section 6.1.5**.

The loading dock will be delivered under the CSSI Approval, and is subject to future reviews as part of the detailed design process. In parallel with the detailed design process, a loading dock management plan will be prepared to ensure the efficient operation of the loading dock facility. TfNSW have prepared a delivery service plan principles document which outlines the principles that will apply to the management of deliveries, servicing and loading dock operation for the OSD. The full document can be viewed in **Appendix A** of the traffic and transport report. In summary, the 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.

Furthermore, the loading dock proposal helps to minimise conflict on Denison Street through sharing a single consolidated vehicular access point to the development and offering a flexible design that would support any future proposed streetscape enhancements to Denison Street. In addition, it is noted that the design of the basement levels (CSSI Approval) also safeguards a future underground loading dock and parking vehicular connection between the proposed OSD basement Level 1 and the neighbouring MLC Building (basement loading dock level) situated to the south of the site on Miller Street. The safeguarding of this vehicular connection will also help to facilitate future traffic operational changes and streetscape enhancements along Denison Street.

5.6 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

6.0 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 concept proposal.

6.1 Traffic generation

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 yield of 59,500m² of office GFA, 5,000m² of retail GFA and 161 parking spaces. This traffic generation estimate was then discounted using the traffic generated by the development that previously existed on the site.

6.1.1 Existing traffic generation from passenger vehicles

At the time of the assessment, the site was in its demolition stage (i.e. works being undertaken under the CSSI Approval), and as a result, it was not possible to confirm the previous development trip generation rates using survey data. Accordingly, an alternative approach was adopted in order to determine the site's baseline approved (or existing) development traffic generation level. This was determined through reviewing information for the adjacent approved developments at 1 Denison Street and 177 Pacific Highway, North Sydney. Both of these development are in close proximity to the site with similar commercial uses, and this together with the traffic surveys carried out at 65 Berry Street (refer to details below), provide an appropriate baseline for the study.

The 1 Denison Street development is located adjacent to the proposed OSD site and was approved to accommodate a similar commercial GFA in 2017. The previous development contained the Berry Square public car park, which was surveyed and offers an understanding of traffic generation rates per space for a public car parking area. The rates adopted for existing levels were as follows:

- AM Peak hour equated to 35 two-way movements for 117 spaces or **0.3** two-way movements per public parking space; and
- PM Peak hour equated to 29 two-way movements for 117 spaces or **0.25** two-way movements per public parking space.

The 177 Pacific Highway development is located on the opposite side of Miller Street, approximately 250 metres to the west of proposed OSD site and was approved to accommodate a similar commercial GFA in 2010. The approved development increased the number of on-site parking spaces from 60 to 112 spaces. The traffic impact assessment stated that 'based on surveys of the traffic generation of similar commercial buildings' the

traffic generation rate to be adopted should be **0.25 to 0.4** vehicle trips per hour per parking space during commuter peak periods.

The 65 Berry Street development is situated directly adjacent to the proposed OSD site and consists of mixed use development (majority commercial) and 259 car parking spaces. The car parking spaces are available to both the building tenants and for public parking. Site observation were carried out in 2017 to help verify the trip rate per parking space against the rates previously defined under the approved 1 Denison Street and 177 Pacific Highway developments. The review confirmed the rates were consistent with observed trip generation rates per parking space of:

- 75 two-way movements for 259 parking spaces or **0.29** two-way movements per parking space in the AM peak hour; and
- 70 two-way movements for 259 parking spaces or **0.27** two-way movements per parking space in the PM peak hour.

Based on the above, a rate of 0.3 trips per parking space has been adopted to assess the previously approved developments trip generation. Application of this rate equates to an existing approved generation of 62 vehicles per hour in the AM peak hour (50veh/hr in, 12 veh/hr out), and 52 vehicles per hour in the PM peak hour (42 veh/hr in, 10 veh/hr out).

6.1.2 Existing traffic generation from service vehicles

TfNSW has prepared an 'Options Analysis and Concept Delivery Service Plan' for Victoria Cross Station with an objective of determining the demand profile for freight and servicing activity for existing commercial development. Based on demand data obtained by TfNSW for similar development, which has been adjusted to accommodate predicted future growth trends for courier deliveries, it was determined that a loading dock for the proposed OSD site (plus the metro station including associated retail) would generate approximately 240 service vehicle trips per day and up to 34 AM peak hour service trips. The data also highlights that the loading dock peak hour occurs outside of standard AM peak commuter period and instead occurred between 9am – 12pm.

Based on the demand profile for deliveries illustrated in **Figure 20**, it was concluded that the generation between the hours of 06:00 – 09:00 was approximately 69 service vehicles. These trips can be evenly spread across the period to determine the AM peak hour rate. The adopted approach highlights that the AM peak hour would generate 46 (23 veh/hr in and 23 veh/hr out) service vehicle trips per hour. This equates to an AM network peak hour service vehicle trip rate of **0.07 service vehicle trips per 100m² Commercial GFA per hour**. When this rate was applied to the previous existing development on the OSD site, it was estimated to generate 14 service vehicle trips in the AM peak hour (7 veh/hr in and 7 veh/hr out).

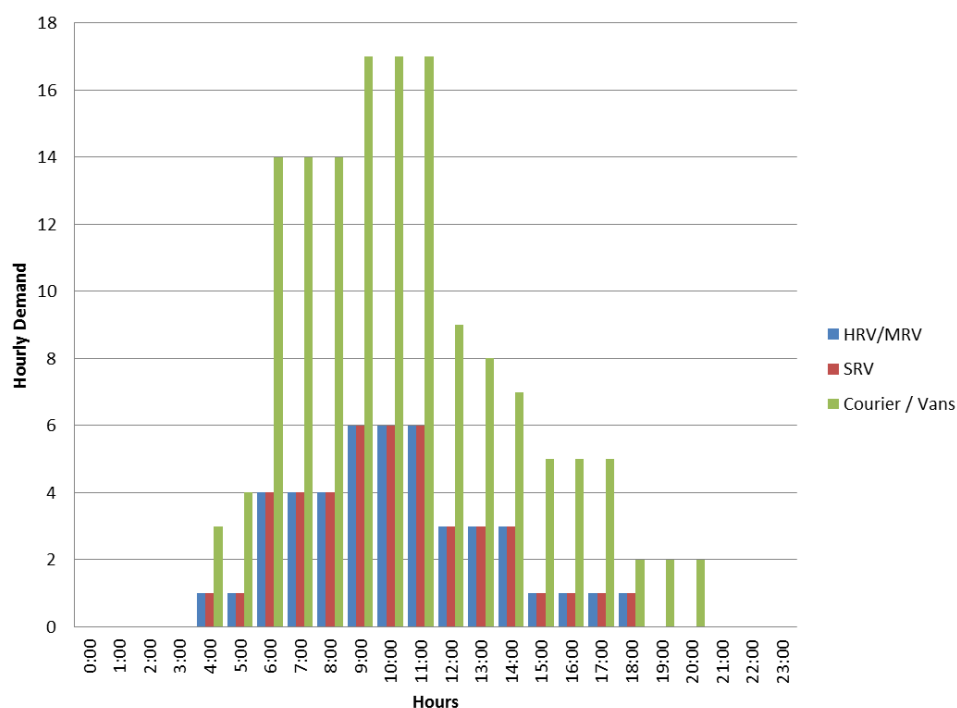


Figure 20: Forecast Service Vehicle Delivery Profile

Source: Commercial Development Weekday Service Vehicle Data – TfNSW, 2018

6.1.3 Summary of existing traffic generation

Based on the data obtained, it is concluded that the development that previously existed on the OSD site generated 76 two-way traffic trips in the AM peak hour comprising 57 traffic movements entering the building and 19 exiting. Refer to **Table 10** for further details.

Table 10: Summary of trip generation from previous development on the OSD site

Source: AECOM analysis

Vehicle Type	Parking Spaces/GFA	Trip Generation Rate	Peak Period Trips Generated	In	Out
Passenger Vehicles	208	0.3 veh/hr per space	62	50	12
Service Vehicles	20,000m ²	0.07 veh/hr per 100m ² GFA	14	7	7
			76	57	19

6.1.4 Future traffic generation from passenger vehicles

Vehicle trip generation has been determined through the review of the following guidelines and previous assessments:

- RMS Guide to Traffic Generating Developments
- Adopted trip rate per parking space for the approved 1 Denison Street and 177 Pacific Highway developments

The Roads and Maritime Services' *Guide to Traffic Generating Developments: Updated traffic surveys* (TDT 2013/04a) were used to forecast the vehicle trip generation rate applicable to high density office blocks. The surveys provided in Appendix D2 of TDT 2013/04a, provide trip rates for an office block in North Sydney (located at 100 Arthur Street), which was adopted as a direct comparison for the proposed OSD. The trip rate adopted is consistent with the existing conditions assessment and applies a parking rate per space calculation identified from the 100 Arthur Street site data contained in TDT 2013/04a.

The surveyed site was identified to contain 136 parking spaces and to generate 52 two-way vehicle trips in the AM peak hour and 44 trips in the PM peak hour. This equates to a trip generation rate of **0.38 and 0.32 trips** per parking space in the AM and PM peak hour, respectively.

A consistency review was undertaken against the approved trip rates per parking space applied for approved developments at 1 Denison Street and 177 Pacific Highway. This review highlighted that the assessment applied a more conservative trip generation rate of 0.4 trips per parking space per hour for the peak hour periods, which explains the potential worst case network impact.

Application of the **0.4 trips** per parking space rate yields a forecast traffic generation for the OSD concept proposal of **64 vehicles per hour** in both the AM and PM peak hours (51 veh/hr in and 13 veh/hr out).

6.1.5 Future traffic generation from service vehicles

Application of the service vehicle trip rate defined in Section 6.1.2 yields a forecast traffic generation from the OSD concept proposal for service vehicles of **45 two-way vehicle trips per hour** in the AM peak hour (23 veh/hr in and 22 veh/hr out).

The above trip generation from service vehicles is based on the fact that the loading dock provision described in **Section 5.5** is fully utilised and able to accommodate all of the servicing needs on site. The hourly service vehicle profile illustrated in **Figure 20** indicates that peak demand for MRVs and SRVs occurs between 09:00 and 11:00, which is outside of the network peak hour. However, there are expected to be a number of service vehicle trips

generated between the hours of 06:00 – 09:00. The delivery service plan principles presented in **Appendix A** of the traffic and transport report outlines that the efficient operation of the loading dock will be achieved through minimising dwell times in the loading dock and maximising throughput of goods and vehicles through the loading dock. Based on the provision of 12 loading dock spaces, and a demand for 23 vehicle arrivals per hour, each loading dock space would be restricted to a maximum dwell time of 30 minutes to accommodate the forecast service vehicle demand. This is a reasonable limit on servicing for a development of this nature; however the development of a full loading dock management plan will be prepared to demonstrate how this will be achieved in practice. Scope does exist to reduce these average dwell times through the application of the delivery service plan principles, which would mean each space could accommodate more service vehicles per hour.

6.1.6 Future traffic generation from Victoria Cross Station

Kiss and ride and taxi facilities for the Victoria Cross Station are proposed to be relocated to McLaren Street as part of the approved northern entrance (CSSI Approval). This change means that traffic associated with the station is less likely to service the southern entry. Based on the predicted mode share, given its network functionality and locality, the resulting traffic impact will be minimal. Pedestrian analysis has taken into account pedestrian movement between McLaren Street and the southern entrance via Miller Street which is not anticipated to be significant. Kerbside allocations along Berry Street are proposed to be retained post Metro station opening.

6.1.7 Summary of forecast traffic generation

The forecast traffic generation from the site associated with the proposed Integrated Station Development is presented in **Table 11**. For the purposes of this assessment, the combined traffic generation from the OSD and the station retail has been considered.

Table 11: Summary of forecast site trip generation

Source: AECOM analysis

Vehicle Type	Parking Spaces/GFA	Trip Generation Rate	Peak Period Trips Generated	In	Out
Passenger Vehicles	161	0.4 veh/hr per space	64	51	13
Service Vehicles	64,500m ²	0.07 veh/hr per 100m ² GFA	45	23	22
			109	74	35

The OSD is forecast to generate in the region of 109 two-way vehicle trips in the AM peak hour (the busiest peak). When compared to the previous development on the OSD site (refer to section 6.1.3) this equates to **33 additional two-way vehicle trips in the AM peak hour**. This would equate to 17 veh/hr arriving to the site, and 16 veh/hr departing based on the assumption that the peak arrivals and departures are evenly split. This is equivalent to about one vehicle trip every two minutes above that generated by the previous development on the OSD site.

6.2 Transport network impacts

This section describes the likely road network impacts as a result of the proposed OSD.

6.2.1 Road network and intersection operation

Section 6.1.7 forecasts a maximum net increase of 33 trips in the AM peak hour (17 veh/hr in and 16 veh/hr out) resulting from the proposed development, which is the equivalent of approximately one vehicle trip every two minutes. The inbound trips are expected to access the site from Pacific Highway via Walker Street, Miller Street or Berry Street. With multiple route options and a generation of about one vehicle every three minutes for inbound traffic, it is not expected that this scale of trips will have a significant impact on network performance. The outbound trips are expected to disperse across the network, and again are not expected to have a significant impact on network performance. Furthermore, net traffic volume increases of such a low order is unlikely to have any material impact on the operation or performance of the surrounding road network and accordingly no external road / intersection improvements is required when referenced against the Roads and Maritime Services' *Guide to Traffic Generating Developments (2002)*. This is supported by the operating conditions of existing intersections, which are identified to operate at LoS C or better and unlikely to be impacted by a minor increase of this extent.

It should also be noted that the increased number of pedestrian movements generated by the OSD is not expected to be significant, less than 10% of that forecast to be generated by the Metro Station. The station modelling undertaken as part of the EIS for the CSSI and subsequent stage 1 station design process, captures this related pedestrian movement. The design of the interface between the proposed OSD and station will encourage and promote access via the new Metro service and as a result, will manage its impact on the public domain and surrounding road network above and beyond any other similar development in the area.

6.2.2 Mode share

The mode share for the site will be influenced by both current trends and future proposed changes. Section 4.1 highlighted the existing journey-to-work mode share trend for workers travelling to locations near to the proposed OSD. The data indicates that 47% of people

chose to travel to work by train, 28% utilising private vehicle for a similar trip purpose, 12% travelling by bus, and the remainder using active travel and other modes.

In order to understand the likely trends from the progressive intensification of North Sydney, a review of other more established areas that form part of the Eastern Harbour City was undertaken with travel zones around Pitt Street and Martin Place used as benchmarks (refer to section 4.1). The review highlighted that the mode share for access by private vehicle for journey to work purposes was significantly lower (15%) than the rate currently exhibited for North Sydney (31%). It is also noted that 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. In terms of planning benchmarks for centres and employment areas in CBD environments, it is noted that Barangaroo was planned around a private vehicle mode share target of 5% and is still subject to completion and validation.

The introduction of Sydney Metro (Northwest and City & South West lines) as well as the Beaches Link and Western Harbour Tunnel will increase the coverage and accessible offering by public transport. The resulting estimated increased coverage of a 30 and 60 minute travel catchment by public transport is illustrated in **Figure 21**.

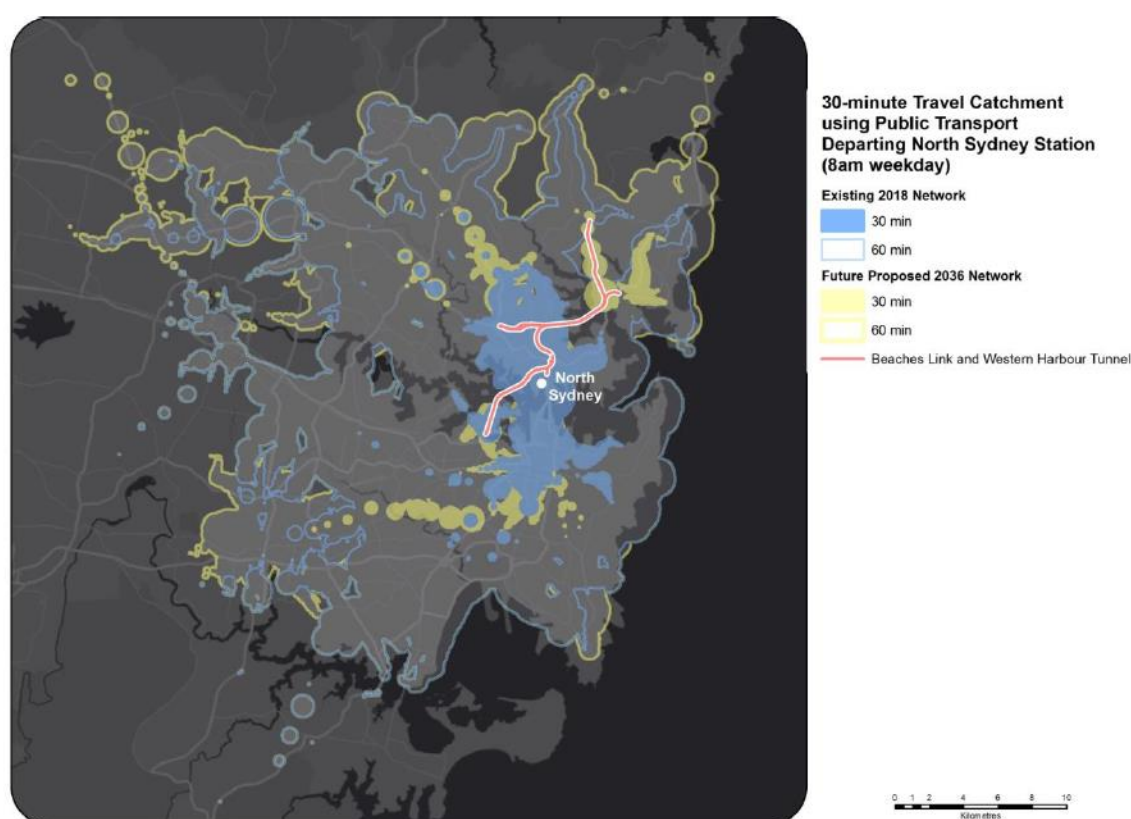


Figure 21: Future Catchment of North Sydney by Public Transport

Source: Transport for New South Wales, 2018

Note – assumes the completion of Sydney Metro City and South West and West Harbour Tunnel and Beaches Link

The OSD will directly benefit from the proposed Victoria Cross 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. In combination with the limited parking supply on-site (due to the OSD's compliance with the maximum parking rates prescribed by the North Sydney DCP), it is expected that journey to work trips generated and attracted from/to the OSD could result in a mode shift towards public transport and active travel modes.

6.2.3 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 Victoria Cross Station.

On this basis, the proposed concept OSD is considered to offer high levels of public transport connectivity. The benchmark public transport mode share of Pitt Street and Martin Place provide aspirational targets for the OSD.

6.2.4 Cycling

The site is situated within a central location in the North Sydney CBD and similar to other CBD locations is served by the North Sydney bicycle network. The OSD site is located to take advantage of the existing and planned cycleway facilities in North Sydney. The development would be located adjacent to designated on-road cycle routes along Miller Street and planned changes to the road and cycle networks.

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

6.2.5 Emergency vehicle access

Emergency vehicle access would continue to be possible via both Denison and Miller Streets. 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.

Further details of the likely impacts and its staging would be assessed by North Sydney Council as part of its Laneways investigations having regard to other public domain enhancements and pedestrianisation proposals.

6.3 Pedestrian generation

According to the CSSI EIS, the projected 2036 AM peak hour pedestrian movements generated by the Victoria Cross Station include approximately 2,600 customers entering at the station and approximately 12,550 customers exiting.

The expected OSD pedestrian movements to and from the Metro station is presented in **Table 12** below. The OSD is likely to generate approximately 8-9% of the total number of pedestrians utilising the Victoria Cross Station and is already captured within the station pedestrian modelling process for the CSSI EIS and was further refined as part of the recent stage 1 Concept Design development process for Victoria Cross station.

Table 12: Forecast peak hour OSD pedestrian movements from/to Metro (p/hr)

Source: CSSI Chatswood to Sydenham EIS, 2016

Peak	Direction	OSD
AM Peak	From Metro	1,004
	To Metro	112
	Total	1,116
PM Peak	From Metro	102
	To Metro	914
	Total	1,015

6.4 Pedestrian impacts

It is estimated the proportion of pedestrian trips generated by the OSD will be less than 10% of the total forecast to be generated by the Metro station. Access between the OSD and station entries will be situated to allow efficient and safe access and to minimise conflict.

6.4.1 Cumulative impacts

Pedestrian modelling of the Metro station with and without the OSD has been undertaken by TfNSW station design team to support the OSD 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 Criteria and the adopted measures are presented in **Table 13**.

Table 13: FRUIN Level of Service Parameters – Walkways

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

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

Detailed comparison of the crossing demand at intersections was undertaken and included with and without the OSD and Metro scenarios. The relevant key findings from the assessment are presented in **Table 14**.

Table 14: 2036 Peak Hour Pedestrian Flows at Adjacent Berry/Miller Street Intersection.

Source: *CSSI Chatswood to Sydenham EIS*, 2016

Peak	Approach	TCS 766 Miller Street / Berry Street	
		Without Background Growth only	With Background Growth and OSD + Metro
AM	North	549	1,164
	South	773	2,353
	East	1,566	2,211
	West	625	1,242
	Total	3,513	6,970
PM	North	411	968
	South	662	2,174
	East	1,048	1,623

Peak	Approach	TCS 766 Miller Street / Berry Street	
	West	548	1,108
	Total	2,669	5,873

*BG – Background Growth

6.4.2 Footpath capacity

To determine footpath performance under the forecast pedestrian flows, a static assessment was undertaken at locations that are perceived to act as movement pinch points around the station.

The 2036 cumulative peak hour demand scenario with 15% background growth was adopted for the assessment of the OSD and Metro station. A peak minute demand was then calculated with a surge factor of 1.2 for a worst-case scenario for all the footpath locations. The Level of Service (LOS) of the footpath locations is determined by comparing bi-directional peak minute pedestrian demand flows, per metre against Fruin LOS criteria.

The effective width adopted for the analysis of footpaths excludes some clearances for street furniture, trees, kerbs and buildings. Results of the static assessment are presented in **Table 15**.

Table 15: Static Assessment of Footpath Performance

Source: CSSI Chatswood to Sydenham EIS, 2016

ID	Location	2-way Pedestrian Flow (pp/hr)	Effective Width (m)	Level of Service
1	Miller Street, south of the southern station entrance	4200	2.9	B
2	Miller Street, North of the southern station entrance	4040	4.3	A
3	Miller Street, outside the OSD entrance*	1540	1.9	A
4a	Denison Street, south of the station entrance	6310	1.3	F
4b	Denison Street, south of the station entrance (widened)	6310	3.0	C

The results indicate that under the given loading conditions, the narrow existing footpath along Denison Road is expected to fail by the year 2036, operating at LOS F.

The estimated increase in demand on this footpath would be largely attributed to the introduction of Victoria Cross Station and the planned development of the precinct and the intensification of surrounding development.

Widening of the footpath into the adjacent parking lane to create an effective footpath width of 3m is expected to improve the performance of the footpath to operate at a LOS C. Any footpath widening would need to be undertaken without adversely impacting service vehicle access and with a view to minimising pedestrian-vehicular conflict.

North Sydney Council's laneway proposals (including the proposed changes to Denison Street) will help to mitigate congestion at the Denison Street Station entry and support pedestrian access through the CBD and place making outcomes for Denison Street. It is also acknowledged that the staging and implementation of this work is critical and should be managed through detailed planning. Refer to section 8 for further details.

Cumulative pedestrian impacts and mitigations will also be addressed as part of the integrated transport planning being undertaken in North Sydney.

7.0 Cumulative traffic impacts

This section responds to cumulative impacts of existing, proposed and approved developments in the area on the surrounding road network as outlined in the SEARs. It is noted that the traffic modelling undertaken in section 6 accounts for known adjacent development proposals in North Sydney CBD.

7.1 Denison street pedestrianisation

The Draft Central Laneways Masterplan prepared by North Sydney Council indicates that a preferred concept for Denison Street is to improve the streetscape and better manage vehicle throughput. The overall aim is to activate frontages and promote this area for pedestrians through managing and reducing traffic flows. The full pedestrianisation of Denison Street with restricted time vehicle access is understood to align with this draft master planning concept.

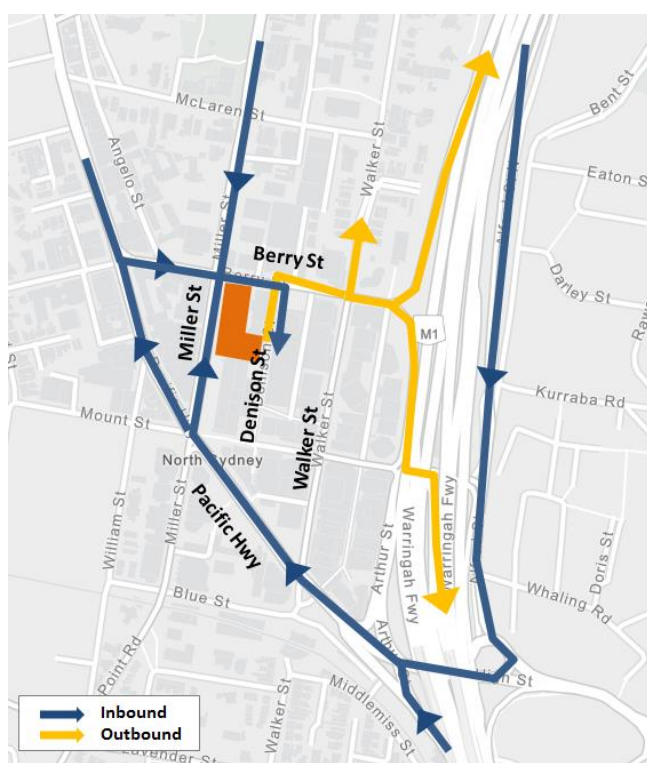


Figure 22: Site vehicular circulation (Denison Street South Closure)

Source: AECOM, 2017

The adoption of this draft concept will change the function of the southern section of Denison Street through preventing vehicle access from the south to the site. **Figure 22:** illustrates the expected vehicle circulation route to the proposed development if Denison Street was pedestrianised. Access to the site would primarily be via Berry Street and Denison Street and it would require Denison Street to become a two-way road between the proposed OSD site loading docks and Berry Street.

Figure 23 illustrates an understanding of the extent of the proposed Denison Street pedestrianisation works.



Figure 23: Denison Street pedestrianisation proposal

Source: North Sydney CDB Laneways Plan, 2017

The pedestrianisation of Denison Street would result in existing traffic diverting to other parts of the CBD road network. Traffic currently accessing the site via Walker Street and Spring Street would be redistributed to the Pacific Highway and Berry Street.

A review of North Sydney Council studies and the 1 Denison Street development application indicated that the assumptions and detailed modelling of road network impacts are not available. It can therefore be concluded that the road network impact from the proposed concept OSD is minimal with an additional 18 vehicles generated in the AM peak hour (or three vehicles every 10 minutes). As highlighted in section 6, the proposal helps to facilitate changes to the local CBD road network through a design that allows two-way operations on the northern section of Denison Street and through safeguarding for a future vehicle connection to the MLC loading dock.

7.2 Western Harbour Tunnel and Beaches Link

A state significant infrastructure application (SSIA) has been lodged with the Department of Planning and Environment for the Western Harbour Tunnel and Beach Link (WHTBL) project.

The project in this application highlights that the 'Western Harbour Tunnel will connect to Westconnex at the Rozelle Interchange, cross under Sydney Harbour between the Birchgrove and Waverton areas and connect with the Warringah Freeway at North Sydney'. The Beaches Link is a tunnel, which will connect the Warringah Freeway, cross under Middle Harbour and join with the Burnt Bridge Creek Deviation at Balgowlah and the Wakehurst Parkway. The project description also highlights that it will improve 'east-west connectivity 'with links to the Lane Cove Tunnel and M2 Motorway via a Gore Hill Freeway Extension'.

The key objectives of the Western Harbour Tunnel and Beaches Link project are to:

- Improve Northern Beaches public transport
- Future-proof Sydney's transport to meet population and growth challenges
- Provide a 'Step change' for public transport for the Northern Beaches and Mosman
- Deliver a new crossing of Sydney Harbour to make Sydney's busiest transport corridor shock-proof
- Cut congestion across northern Sydney and the Sydney CBD
- Better access to jobs, education and community services for northern Sydney
- Provide better east-west, north-south connectivity

- Reduce rat-running on local community roads¹

A summary of the project area is illustrated in **Figure 24**.



Figure 24: Western Harbour Tunnel and Beaches Link Summary

Source - <http://www.rms.nsw.gov.au/projects/sydney-north/western-harbour-tunnel-beaches-link/index.html>

Based on the project objectives, it appears that the purpose of the WHTBL project is to reduce traffic on local roads, help manage congestion through strategic road connections, promote public transport usage and provide additional capacity to help accommodate

¹ <http://www.rms.nsw.gov.au/projects/sydney-north/western-harbour-tunnel-beaches-link/index.html>

planned growth. Based on these clear project objectives and known network pinch points around North Sydney CBD, it is expected that any traffic growth along the arterial road network surrounding the site would be mitigated by the construction of the WHTBL.

To allow for any unknown impacts beyond the information presented by the project, this assessment has included a sensitivity test. The sensitivity test assumes a 15% total growth in background traffic on Berry Street only as a future 2036 with the OSD development operational. Traffic growth on Pacific Highway up to 2036 is assumed to remain static given the route capacity constraints, mode shift benefits to public transport resulting from Victoria Cross Station and through the introduction of WHTBL. A review of historical traffic data for the Pacific Highway permanent count station (ID: 33014) located north of Mowbray Road, confirms this assumption and demonstrates a no traffic growth trend in both the northbound and southbound directions since 2011.

The network modelling results from the application of the 15% growth rate to Berry Street and additional OSD Concept traffic in the AM and PM peak hour are presented in **Table 16**.

Table 16: AM and PM peak hour SIDRA intersection analysis with 15% background traffic growth on Berry Street

Source: AECOM analysis

Intersection	DoS	LoS	Average Delay (s)	95% Back of Queue (m)
AM				
Miller Street / Pacific Hwy	0.646	C	30.2	104.9
Berry Street / Pacific Hwy	0.866	B	16.6	139.7
Miller Street / Berry Street	0.813	C	39.8	169
Berry Street / Denison Street	0.139	A	7.4	3.7
Berry Street / Walker Street	0.887	C	33.1	241.9
Miller St / McLaren Street	0.567	B	23.1	92.2
PM				
Miller Street / Pacific Hwy	0.519	C	31.2	85.5
Berry Street / Pacific Hwy	0.873	B	15.1	148.3
Miller Street / Berry Street	0.892	C	42.1	204
Berry Street / Denison Street	0.468	A	9.1	8.3
Berry Street / Walker Street	0.864	C	37.9	191.1
Miller St / McLaren Street	0.693	B	23	85.1

The modelling results highlight that the intersections will continue to operate between LoS A and C, which is satisfactory level of operation and only results in minor operational changes from the operating performance identified under the existing conditions assessment (**Table 4**).

8.0 Construction management methodology

8.1 Staging and framework for managing environmental impacts

TfNSW proposes to procure the delivery of the Victoria Cross Integrated Station Development in one single package, which would entail the following physical works:

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

The contractual obligation to complete the station is separated from the contractual obligation to complete the OSD to allow the delivery of the OSD in line with market conditions.

8.1.1 Coordination with other C&SW contracts

Separate TfNSW delivery packages also support the delivery of this section of the C&SW project and include:

- The excavation of the station boxes/shafts, which will be delivered ahead of the commencement of the station works under the ISD procurement package.
- Installation of linewide systems including track, power, ventilation systems, which are completed once the relevant portions of the station works are completed.
- Operational readiness works are undertaken prior to the operation of Sydney Metro City & Southwest metro system.

8.1.2 OSD construction staging options

Three possible staging scenarios have been identified for delivery of the OSD:

1. **Scenario 1** – the station and OSD are constructed concurrently by constructing the transfer slab first and then building in both directions (lower basements levels and the commercial tower) with a program completion date for both the station and OSD in 2024.
2. **Scenario 2** – the station is constructed first and ready for operation in 2024 and under this scenario OSD construction may still be incomplete or ready to commence after station construction is completed. This means that some or all of the OSD construction is likely to still be undertaken after the opening of the station in 2024.
3. **Scenario 3** – the station is constructed first and ready for operation in 2024 and 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.

8.1.3 Preferred construction staging scenario

Scenario 1 is TfNSW's preferred option as it would complete the full Integrated Station Development and therefore provide the optimum public benefit for the site and North Sydney CBD 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.

8.1.4 Management of combined environmental impacts

The final staging options 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, TfNSW proposes the framework illustrated in **Figure 25**: to manage the design and environmental impacts associated with traffic issues, consistent with the framework adopted for the CSSI Approval.

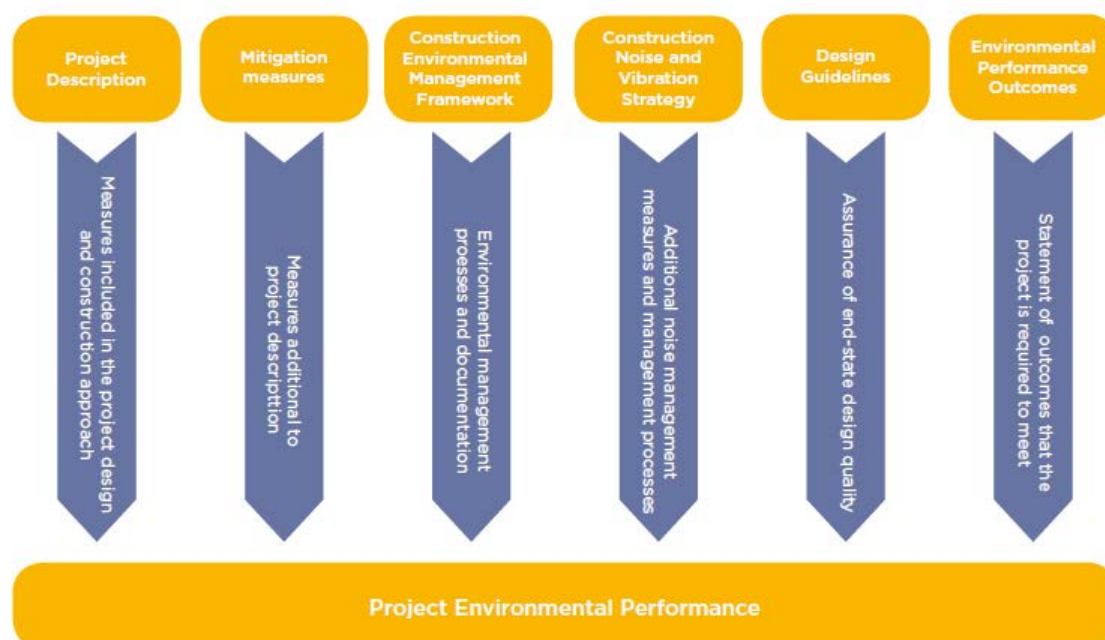


Figure 25: Project approach to environmental mitigation and management

Source: CSSI Chatswood to Sydenham EIS, 2016

This approach would be implemented until such time as completion of the station works (i.e. works under the CSSI Approval) is achieved. Beyond that point, standard construction environmental management practices would be implemented by the OSD developer in accordance with relevant guidelines and any conditions of approval.

8.2 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.

8.3 Construction traffic management process

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.

8.4 Construction management statement

A Construction Management Statement has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) for a concept State Significant Development Application (concept SSD Application) proposing over station development (OSD) above the portal of Victoria Cross Station. Refer to **Appendix V** of the EIS. The SEARs calls for the preparation of preliminary construction management statement (the Statement) addressing how future construction stages will manage impacts to pedestrians, rail users, bus services and taxis.

9.0 Conclusions

This section summarises 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 be progressed as part of the subsequent detailed SSD Application.

9.1 Key findings

The key findings from the assessment are as follows:

- The proposed concept OSD aligns with NSW Government and North Sydney Council transport strategies and policy and in particular the objectives of **Future Transport 2056**.
- The 2011 travel characteristics for 39,511 people who work in these travel zones highlights that:
 - The current high proportion of journey-to-work trips are made by train, which highlights that approximately 47 per cent of trips are attributable to this mode.
 - A total public transport mode share of 59 per cent, which is significantly greater than the Greater Sydney average of 20 per cent and similar to other highly accessible Eastern Harbour City localities.
 - A high proportion of private vehicle trips for journey to work to a CBD location, which currently represents 31 per cent of trips to the area.
- The proposed provision of **802 bicycle parking spaces** with end-of-trip facilities which exceeds the North Sydney DCP minimum requirements for bicycle parking for new developments in this locality.
- The proposed provision of 161 **car parking** spaces is in accordance with North Sydney Council DCP maximum requirements for car parking for new developments in this locality. This allocation consists of 150 spaces designated for 60,000m² of commercial land use (this proposal) and 11 spaces that are already allowed for under the CSSI (Chatswood to Sydenham) Approval.
- The estimated **traffic generation** from the proposed concept OSD development is for 109 two way vehicle trips (includes passenger and service vehicles), which represents an additional 33 vehicle trips above that was generated from the previously approved on-site developments. This equates to about one additional vehicle trip every two minutes during the AM peak hour.
- The additional trip generation is insignificant and is forecast not to impact on the **operating performance of the surrounding road network**.

- That the **proposed loading dock** is capable of accommodating two medium rigid vehicles, two small rigid vehicles, two vans to support metro station operations and eight courier 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 western side of Denison Street, which helps to reduce the number of vehicle conflict points along Denison Street through combining three previous private and service vehicle access points to the site into one.
- The location of the OSD will enable its users to benefit from a vast number of public and active transport modes. Along with the intensification of North Sydney CBD, it is the long term aspiration that the mode share attributable to the OSD will be comparable with sites in the Eastern Harbour City such as Pitt Street and Martin Place.

9.2 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 17: 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	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.
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	6	The assessment defines both current and expected trips generated by the proposal and confirms the approach undertake to address cumulative impact. The assessment concludes that the traffic generation resulting from the proposal is insignificant and supports a positive shift in travel mode share away from private vehicle travel, which both supports and aligns the planned growth of North Sydney CBD and travel patterns already exhibited at other established

Item	Requirement	Section	Comment
	the area and any transport/ traffic upgrade		<p>parts of the Eastern Harbour City with similar accessibility profiles.</p> <p>The current cycle network identified in North Sydney Council's plan provides and supports access to planned OSD accesses via Miller Street and Mount Street. It is also acknowledged that other planned network enhancements currently being investigated by North Sydney Council and TfNSW as part of a wider North Sydney CBD access plan would also benefit the site, along with the accessibility and the growth potential of North Sydney as a whole.</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 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 North Sydney.</p>
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 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. 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 an unique opportunity that will support the continuous shift towards active and public transport as the preferred travel modes for accessing North Sydney. This trend is supported by a proposed reduced parking provision for the site when compared to the previous on-site development, planned improvements to the urban domain as part of the</p>

Item	Requirement	Section	Comment
			approved Victoria Cross station and the proposal for 802 EOT bike parking spaces. All of the above help to manage the impact on a CBD environment and support the place making outcomes for North Sydney as a whole.
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, 6	All traffic and pedestrian modelling for the proposed development supports both station, station retail and OSD and is consistent with the RMS/ TfNSW guidelines for traffic generating development and traffic modelling.
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	9.3	The assessment provides an understanding of the mitigation measures that will help to both manage the delivery and operation of the proposed development. Refer to TT2 for reference to proposed upgrades that help to manage network impacts, support the Integrated Station Development design proposal and growth of North Sydney as a whole and positive place making outcomes.
TT6	proposed car and bicycle parking provision for workers and visitors, including consideration of the availability of public transport and the requirements of the relevant parking codes and Australian Standards	4,5,6	The concept proposal aligns with DCP 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 delivered in accordance with parking codes and the Australian Standards.
TT7	loading dock and servicing arrangements, including consideration of loading zone hub facilities	5.5	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.
TT8	measures to be implemented to encourage	4,5	The concept proposal proposes reduced car parking provision from the previously approved

Item	Requirement	Section	Comment
	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		on-site development, utilise 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. The proposed provision of over 800 bike parking 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 as part of future detailed SSD Application. .
TT9	consider the future pedestrianisation of laneways east of the Metro site (Denison Street, Spring Street and Little Spring Street) with regard to the North Sydney Council concept plan for the treatment of laneways in the CBD	7.1	The assessment acknowledges the future vision for the Denison Street and allows for staged changes that will assist in the transformation of this street to a one way shared zone or pedestrianised area, and adjustments to the neighbouring local street network. This includes the safeguarding for a future service vehicle connection to be made between the basement level and the neighbouring MLC building, acknowledging that execution of this breakthrough is not within the control of the Applicant and does not form part of this application.
TT10	consider the impacts of the proposed Western Harbour Tunnel Beaches Link (WHTBL)	7.2	The assessment considers publicly available project information that helps to define the relationship with the project concept and WHTBL, which have been verified through consultation with stakeholders. The inclusion of a 15% increase in traffic on Berry Street in the modelling of intersections is assumed to account for any likely potential changes in road performance and allows planners to understand the operational sensitive of this road corridor.
TT11	Identify required work zones and the functionality and impact on pedestrian amenity and public domain.	6.3,8	The proposal includes a staging strategy for the development of the site, which aims to minimise impact on its CBD surroundings and station operations through the coordinated and promotion of the early delivery of the OSD. Mitigation measures related to the detailed planning and approval of construction will help manage impacts

Item	Requirement	Section	Comment
			associated with the construction phase and recognises the complexity of working in densely populated CBD environments.

9.3 Recommendations

The following recommendations are made to support the approval of the concept SSD Application:

- 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 North Sydney DCP**.
- The inclusion of **2 accessible parking bays** in accordance with North Sydney Council DCP 2013 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 **over 800 bike parking spaces**, which are easily accessed and are supported by **end of trip facilities**.
- The provision for safe access, secure and conveniently located bike parking facilities within the building to support and **promote cycling** and help North 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 Victoria Cross Station has been reached. Beyond completion of Victoria Cross Station, detailed design of the OSD building and its traffic, parking, pedestrian and cycle accessibility impacts would require **consultation with relevant stakeholders**.

Appendix A

Delivery Service Plan Principles

Delivery Service Plan Principles

Purpose

This document outlines the principles that will apply to the management of deliveries, servicing and loading dock operation for the Over Station Development (OSD) above the Victoria Cross station.

Scope

This document addresses the principles and possible initiatives that may be adopted as part of the Delivery Service Plan (DSP) to be documented subsequent to lodgement of the Stage 1 development application. **Figure 1** below summarises the management task, OSD proposal and associated DSP principles.

The Management Task

Site constraints prevent the provision of more than the below mentioned ten servicing spaces within the loading dock. 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:

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

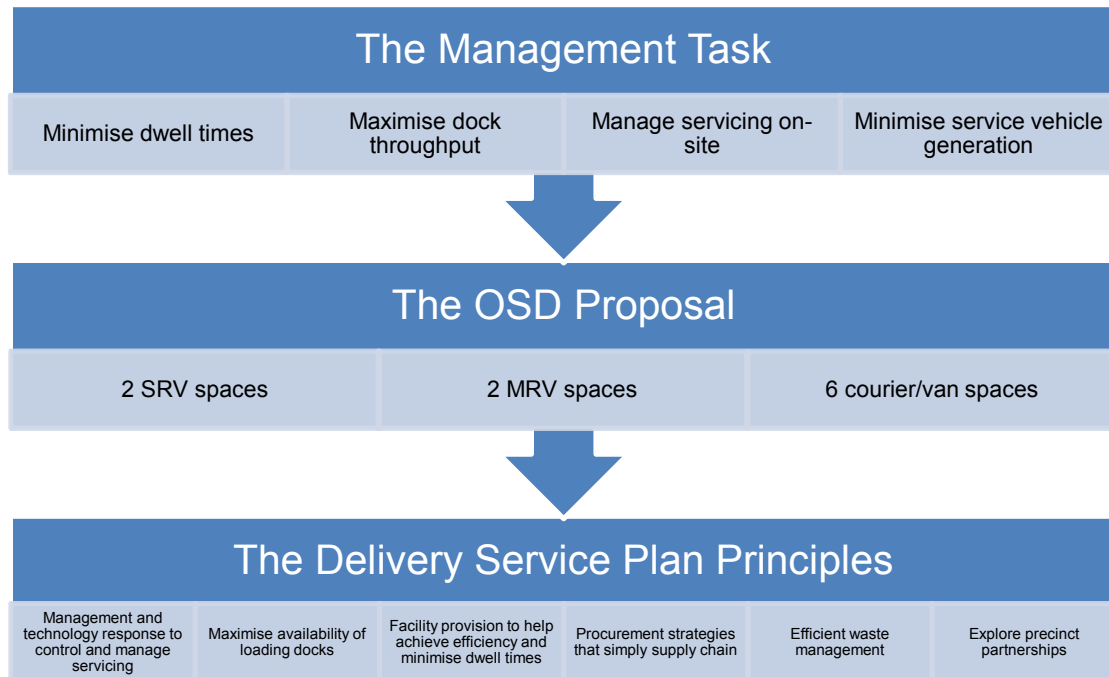


Figure 1 – The Delivery Service Plan Principles

The Concept SSD proposal

The Concept SSD proposal comprises the following loading dock facilities accessed via Denison Street:

10 servicing spaces as follows:

- 2 small rigid heavy vehicle spaces
- 2 medium rigid heavy vehicle spaces
- 6 courier / van spaces

Two van spaces will also be located in this same loading dock area for Metro station use.

OSD 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. Average dwell times of 20 minutes or less may be achievable for some delivery and servicing purposes.
- 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 Victoria Cross OSD for subsequent delivery by foot / cycle courier.

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