

Transport Assessment Report

Western Sydney University Innovation Hub
2-6b Hassall Street, Parramatta

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1 Introduction

1.1 Overview

Ason Group has been engaged by Solutions Consulting Australia on behalf of Charter Hall to prepare a Transport Assessment (TA) to support a State Significant Development Application (SSDA) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The SSDA relates to a mixed-use tertiary educational and commercial development at 2-6b Hassall Street, Parramatta, also known as the Western Sydney University (WSU) Innovation Hub. The development provides 30,440m² Gross Floor Area (GFA) with 14 basement parking spaces (the Proposal).

The Proposal seeks to expand WSU's Parramatta CBD campus network to include a state-of the-art facility for engineering innovation and will offer programs across engineering, architecture and entrepreneurship. WSU is reshaping its campus network, to combine existing campuses with CBD vertical campuses and is committed to developing a campus precinct that connects with and embeds business, industry and community partners.

This TA provides an assessment of the access, traffic, pedestrian links and parking characteristics of the proposed development. This report has been prepared having regard to the Secretary's Environmental Assessment Requirements (SEARs) for the project by the Department of Planning and Environment (DPE), Ref. SEAR 9670, issued on 9 November 2018.

1.2 Secretary's Environmental Assessment Requirements

The SEARs outline the key areas for consideration in any subsequent development application (i.e. in this SSDA) with specific requirements providing the scope for an assessment of potential traffic and transport impacts arising from the development.

Table 1 below provides a summary response to each of the SEARs, as well as a reference to specific sections of this TA providing a more detailed analysis of each requirement.

Table 1: Secretary's Environmental Assessment Requirements

SEARs - General	Summary Response	TA Section
Accurate details of the current daily and peak hour vehicle, existing and future public transport networks and pedestrian and cycle movement provided on the road network located adjacent to the proposed development.	This TA Report provides an overview of existing public transport, pedestrian connectivity, bicycle networks and all traffic and transport facilities around the Site. Current vehicle volumes are further detailed in Section 5 .	5, 6
Details of estimated total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and bicycle trips based on surveys within the local area.	A detailed assessment of the potential peak hour and daily vehicle trip generation of the proposal (based on the RMS Guide) is provided in Section 8 . Further information regarding public transport, pedestrian, and bicycle trips is detailed in Sections 9 and 10 .	8, 8, 10
The adequacy of existing public transport or any future public transport infrastructure within the vicinity of the site, pedestrian and bicycle networks and associated infrastructure to meet the likely future demand of the proposed development.	<p>Sections 9 and 10 provide information regarding adequacy of existing public transport and pedestrian infrastructure to accommodate the future demand of the proposal.</p> <p>The additional trips associated with the proposed development would be accommodated by the existing infrastructure, noting that the Site is well integrated within the public and active transport networks.</p> <p>The Site is accessible for pedestrians approaching from all directions and it is notable that the footpath would be further improved over existing conditions. Notably, there is a safe and direct route from the Site to the Transport Interchange through a signalised intersection at Hassall Street and Station Street.</p> <p>The Site is therefore adequately catered for by the extensive transport amenities in the area.</p> <p>As discussed in Section 6, the Site is already highly accessible by public transport. As per Section 10 it is expected that this existing infrastructure would accommodate the trips generated the Proposal. It is also worthy of note that these connections would be further enhanced by Parramatta Light Stage 1 and the proposed Sydney Metro West project.</p> <p>Further, bicycle parking and End of Trip Facilities (EOTF) as detailed in Section 7 would be provided for the Proposal.</p>	6, 7, 8, 10
Measures to integrate the development with the existing/future public transport network.	<p>The Proposal has been designed to maximise pedestrian amenity along its Site frontage, providing at least a 2.6m set-back from Hassall Street. This would improve the environment for pedestrians along Hassall Street and aide in encouraging trips on foot.</p> <p>Further, superior cycle parking and EOTF have been provided for within the development and the implementation of GTP would ensure that all users are aware of these facilities.</p> <p>Finally, a restrictive approach to car parking has been taken for the Proposal, which would ensure travel by non-car modes is maximised.</p>	2, 6, 9, 10
The impact of trips generated by the development on nearby intersections, with consideration of the cumulative impacts from other approved developments in the vicinity, and the need/associated funding for, and details of, upgrades or road improvement works, if required (Traffic modelling is to be undertaken using SIDRA network modelling for current and future years).	<p>Section 8 details the methodology undertaken for the traffic assessment, including SIDRA analysis of the key intersections of Station Street / Hassall Street and Hassall Street / Charles Street.</p> <p>The assessment has illustrated that, even when considered alongside other development proposals in the vicinity of the Site, the Proposal would not have a material impact on the operation of the road network.</p> <p>Noting the restrictive approach to parking taken in the design of the Proposal, the "net" increase in traffic</p>	8

	generation during the peak hour is not significant (10 veh/hr and 9 veh/hr in the AM and PM peak periods respectively).	
The identification of infrastructure required to ameliorate any impacts on traffic efficiency and road safety impacts associated with the proposed development, including details on improvements required to affected intersections.	As above, the restrictive approach to parking taken in the design of the Proposal has resulted in a nominal level of traffic generation. The Proposal therefore does not significantly impact the operation of the road network and no upgrades are required to accommodate it.	8
Details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of a location-specific sustainable travel plan (Green Travel Plan and specific Workplace travel plan) and the provision of facilities to increase the non-car mode share for travel to and from the site.	A Travel Plan Framework has been outlined in Section 10.6. The GTP is intended to develop a package of site-specific measures to promote and maximise the use of sustainable travel modes, including walking, cycling, public transport and car sharing. This draft package would be further developed at CC and OC stages, and it is expected that a suitable condition of consent would be imposed requiring approval by Council.	10.6
The proposed walking and cycling access arrangements and connections to public transport services.	It is proposed that access to the public transport, cycling and pedestrian network detailed in Section 6 will remain consistent with the existing situation. Improvements would be made by enhancing the pedestrian amenity along Hassall Street as discussed in Section 9.	6, 9
The proposed access arrangements, including car and bus pick-up/drop-off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones.	The proposed access arrangements are detailed in Sections 9 and 12. It is noted that no pick-up/drop-off facilities are required for this kind of development, which is consistent with WSU's other Parramatta CBD campus known as 1 Parramatta Square. As discussed in Section 9, the Proposal would not impact the operation of the signalised crossing at Station Street / Hassall Street. It has been concluded that the Proposal <u>would not</u> result in the requirement for mitigation measures as a result of impacts on traffic or the public and active transport network.	8, 9, 10
Proposed bicycle parking provision, including end of trip facilities, in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance.	As per Section 7 , 188 bicycle parking space are to be provided as part of the development, with 178 provided within the basement. EOTF are to be provided on the ground level with separate changing rooms and a total of 18 showers to be provided to service the development.	7
Proposed number of on-site car parking spaces for staff and visitors and corresponding compliance with existing parking codes and justification for the level of car parking provided on-site.	As discussed in Section 7, a total of 14 car parking spaces are to be provided, in-line with the maximum provisions suggested by the endorsed <i>Technical Paper 3 - Parking Review</i> (2017). Reducing parking provision in turn reduces car use and encourages travel by non-car modes. Noting the Site's proximity to public transport, it is therefore ideally located for implementation of this approach.	7
An assessment of the cumulative on-street parking impacts of cars and bus pick-up/drop-off, staff parking and any other parking demands associated with the development.	The parking requirements of the Proposal are discussed in Section 7. It is expected that, given the restricted parking in the streets surrounding the Site and the restrictive approach taken to parking provision for the development, that most of the trips associated with the Proposal would be undertaken by public and active transport modes and the parking demands of the Proposal would be minimal. The Proposal would therefore not materially impact on on-street parking demands.	7
An assessment of road and pedestrian safety adjacent to the proposed development and the details	Crime prevention through environmental design (CPTED) is a multi-disciplinary approach to deterring	N/A

<p>of required road safety measures and personal safety in line with CPTED.</p>	<p>criminal behaviour. The three principles of CTPED involve:</p> <ul style="list-style-type: none"> ▪ Natural surveillance – this involves a design which places activities and physical features in a way that facilitates natural surveillance of that area. For example, if parking areas aren't located in locked, secured facilities they should have natural surveillance. ▪ Access Control – access can be restricted by physical barriers which can increase an effort to conduct a crime ▪ Ownership – criminal and antisocial behaviour thrive in isolated and unused places. Fences, paving, art, signs, good maintenance and landscaping are some physical ways to express ownership. Identifying intruders is much easier in a well-defined space. <p>The CTPED principles that have been incorporated from a traffic and transport perspective to maintain road and personal safety are as follows:</p> <ul style="list-style-type: none"> ▪ Provision of a control point (garage door into basement). ▪ Provision of car and cycle parking in a secure basement. ▪ Designed with regard for the Australian Standards (Access & Parking). 	
<p>Emergency vehicle access, service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times for the delivery of goods to any retail, commercial and educational facilities within the development).</p>	<p>The maximum servicing vehicle required to access the Site is a 6.4m SRV, with servicing conducted through a private contractor (please refer to waste consultant report for further information on frequency and times). The proposed basement has therefore been designed to accommodate a maximum size vehicle of 6.4m SRV truck.</p> <p>Emergency vehicle access is expected to be provided in a consistent manner to the current situation (i.e. via Hassall Street). Please refer to the relevant supporting documents prepared separately.</p>	<p>7 & 12</p>
<p>The preparation of a preliminary Construction Traffic and Pedestrian Management Plan to demonstrate the proposed management of the impact in relation to construction traffic addressing the following:</p> <ul style="list-style-type: none"> ▪ assessment of cumulative impacts associated with other construction activities, including but not limited to Parramatta Square and the Parramatta Light Rail (PLR) project. ▪ an assessment of road safety at key intersection and locations subject to heavy vehicle construction traffic movements and high pedestrian activity ▪ measures proposed to mitigate any associated general traffic, public transport, pedestrian and cyclist impacts ▪ details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process ▪ details of anticipated peak hour and daily construction vehicle movements to and from the site ▪ proposed haulage routes and location of work zones (if any) ▪ details of on-site car parking and access arrangements of construction vehicles, 	<p>A Construction Traffic and Pedestrian Management Plan (CTPMP) was prepared as part of the Demolition works, provided as Appendix B, which outlines the key principles to be followed for construction traffic management and a high level assessment of traffic associated with that stage of construction.</p> <p>Once further details are available for the construction of Proposal (i.e. staging), the Demolition CTPMP would be further developed (in consultation with Council and the Sydney Coordination Office (i.e. TfNSW)) into a detailed CTPMP covering construction of the Proposal. For the purposes of this SSDA, the Demolition CTPMP provides the high-level principles which would be adopted for the future CPTMP.</p>	<p>11</p>

<ul style="list-style-type: none"> construction workers to and from the site, emergency vehicles and service vehicle details of temporary cycling and pedestrian access during construction. 		
<p>Relevant Policies and Guidelines:</p> <ul style="list-style-type: none"> Guide to Traffic Generating Developments (Roads and Maritime Services) EIS Guidelines – Road and Related Facilities (DoPI) Cycling Aspects of Austroads Guides NSW Planning Guidelines for Walking and Cycling Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development Standards Australia AS2890.3 (Bicycle Parking Facilities). 	<p>These Policies and Guidelines have been referenced as part of this assessment.</p>	N/A
<p>Relevant RMS Consultation.</p>	<p>An email was sent to RMS in February 2019 outlining the Proposal and Ason Group's proposed approach to assessing the traffic impacts of the Proposal.</p> <p>The RMS response received on 14/02/2019 confirmed that the cumulative modelling assessment would be sufficient to assess the traffic impacts of the Proposal.</p>	N/A

1.3 Transport Assessment Objectives

The key objectives of this Transport Assessment are:

- To provide an appropriate response to the SEARs;
- To establish that the development of the WSU Innovation Hub is compliant and consistent with the City of Parramatta Council's (Council) planning guidelines;
- To demonstrate the Site's accessibility to public and active transport;
- To illustrate that the Site is strategically well located to achieve the State Government's transport goals to reduce private vehicle travel, with specific regard to the Greater Sydney Commission's (GSC) *Greater Sydney Region Plan* and the 30-minute City principles;
- To establish that the vehicle trip generation of the development can be appropriately accommodated by the local road network;
- To demonstrate that there is an appropriate and sustainable allocation of car parking across the development; and
- To demonstrate that all proposed access driveways, car parks and service facilities can be designed to provide full compliance with the relevant Australian Standards.

To achieve these objectives, this TA provides an assessment of the existing and future operation of the road network servicing the WSU Innovation Hub, as well as other traffic and transport related issues

including car parking requirements, vehicle access, and public and active transport accessibility. The following key tasks have been undertaken in the preparation of this TA:

- A review of the existing and proposed future road network providing access for the development;
- The quantification of existing and future traffic flows in key roads and at key intersections providing access for the development, including the commission and review of peak period traffic surveys;
- An assessment of the traffic generation and distribution characteristics of the WSU Innovation Hub;
- A detailed assessment of the potential impact of additional traffic flows on the key roads and intersections within the local road network;
- A detailed assessment of the existing and future public transport network servicing the Site and Parramatta; and
- An assessment of internal access, parking and servicing provisions with reference to the appropriate Australian Standards.

1.4 Reference Documents

In preparing this TA report, Ason Group has referenced the following key Council planning documents that are relevant to development at the Site:

- Parramatta Local Environmental Plan (LEP) (2011); and
- Parramatta Development Control Plan (DCP) (2011).

This TA also references general access, traffic and parking guidelines, including:

- RMS (formerly RTA) *Guide to Traffic Generating Developments* (RMS Guide);
- RMS Technical Direction TDT 2013/04a, *Guide to Traffic Generating Developments – Updated traffic surveys* (RMS Guide Update);
- Australian Standard 2890.1 (2004): *Off-street Car Parking* (AS2890.1);
- Australian Standard 2890.2 (2002): *Off-street Commercial Vehicle Facilities* (AS2890.2);
- Australian Standard 2890.3 (2015): *Bicycle Parking* (AS2890.3);
- Australian Standard 2890.6 (2009): *Off-street Parking for People with Disabilities* (AS2890.6);
- TfNSW, *NSW Future Transport Strategy 2056*, March 2018;
- INSW, *State Infrastructure Strategy 2018 - 2038 Building the Momentum*, February 2018;
- GSC, *A Metropolis of Three Cities – the Greater Sydney Region Plan*, March 2018;

- TfNSW, *Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area*, December 2013 (PT Guidelines);
- Council, *Integrated Transport Plan for Parramatta City Centre*, May 2010;
- Council, *Parramatta CBD Planning Strategy*, April 2015;
- Aecom, *Parramatta CBD Strategic Transport Study*, March 2016;
- Aecom, *Technical Paper 3 - Parking Review, Supplement to the Parramatta CBD Strategic Transport Study*, March 2017; and
- Council, *Parramatta CBD Pedestrian Strategy*, April 2017.

1.5 Report Structure

This report is structured as follows:

- Section 2 provides a summary of the SSDA Proposal.
- Section 3 describes the existing Site conditions.
- Section 4 details the relevant strategic context.
- Section 5 details the local road network conditions.
- Section 6 describes public transport, pedestrian and cycling links available.
- Section 7 outlines the parking requirements applicable to the proposed development.
- Section 8 assesses the traffic characteristic of the proposed development, including the projected trip generation of the Proposal and the resultant performance of the local road network.
- Section 9 assesses the pedestrian impacts of the Proposal.
- Section 10 details the public and active transport implications of the proposed development, including sustainable travel targets, increased demand for bus services and the provision of pedestrian infrastructure.
- Section 11 outlines a Preliminary Construction Traffic and Pedestrian Management Plan.
- Section 12 provides a review of proposed access, parking and servicing infrastructure with reference to the appropriate Australian Standards.
- Section 13 provides a summary of the key conclusions.

2 Overview of Proposal

2.1 Summary of Proposed Development

A detailed description of the proposed development is included in the Statement of Environmental Effects (SEE) prepared by Ethos Urban, which this TA accompanies. In summary, the SSDA will seek consent for the redevelopment of the Site as a mixed-use development comprising a tertiary institution, commercial and retail uses. Specifically, the proposal will seek approval for:

- Construction of a 19 storey building, to provide 30,440m² of GFA, including;
 - 15,337m² of tertiary education GFA;
 - 12981m² of commercial tenancy GFA;
 - 211m² of retail GFA
 - Basement / Lower Ground level including 14 car parking spaces, a loading dock, back-of-house storage and plant, end-of-trip facilities and tertiary institution floorspace;
 - Ground level including retail tenancies, tertiary institution lobby floorspace, a commercial office lobby, plant equipment and driveway ramp;
 - Above Ground levels comprising tertiary institution and commercial floorspace; and
 - Mid-rise and rooftop terraces and plant equipment.
- A consolidated vehicular access on Hassall Street.
- Landscaping and public domain works including the provision of a Ground level through-site link.
- The extension and augmentation of services and infrastructure as required.

It is noted that, in accordance with separate early works DAs submitted to Council, the Site will be cleared, remediated and excavated in preparation for the subject SSDA.

Detailed plans prepared by Tzannes & Blight Rayner are provided elsewhere in the SEE; copies of plans specifically relevant to the discussion of access, traffic and parking issues are shown in **Figure 1** and **Figure 2**.

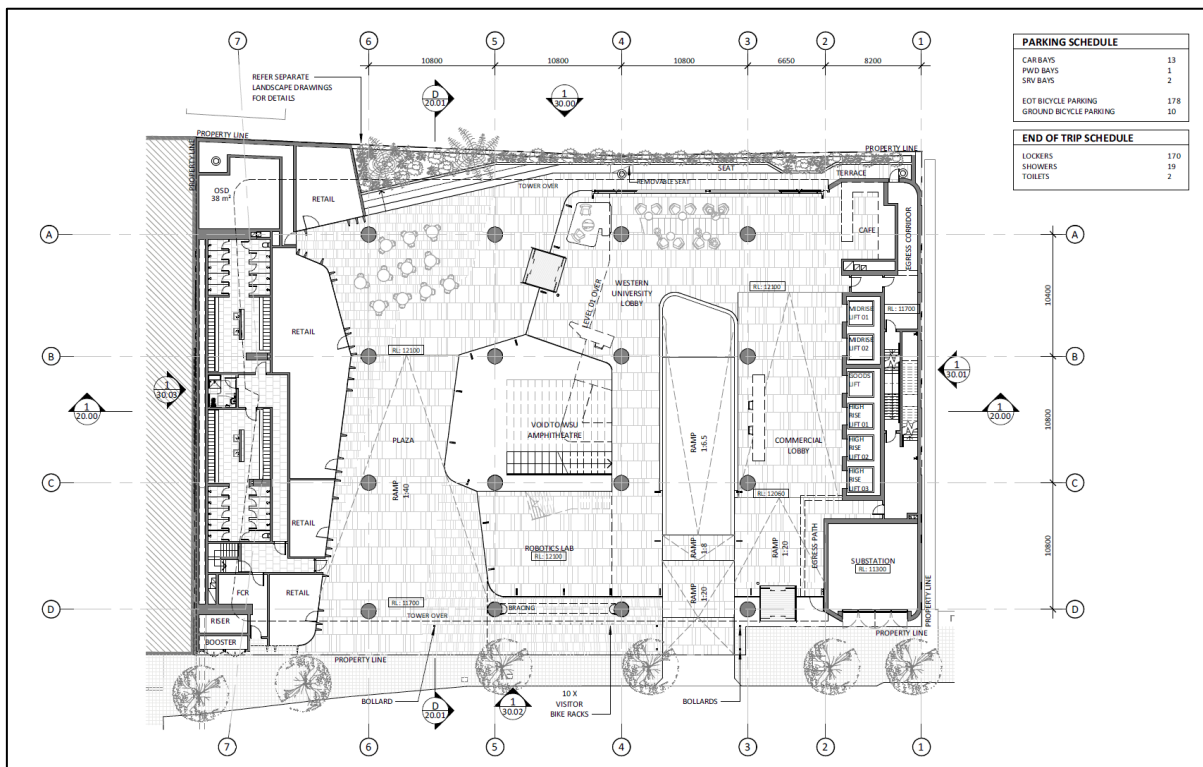


Figure 1: Proposed Ground Floor

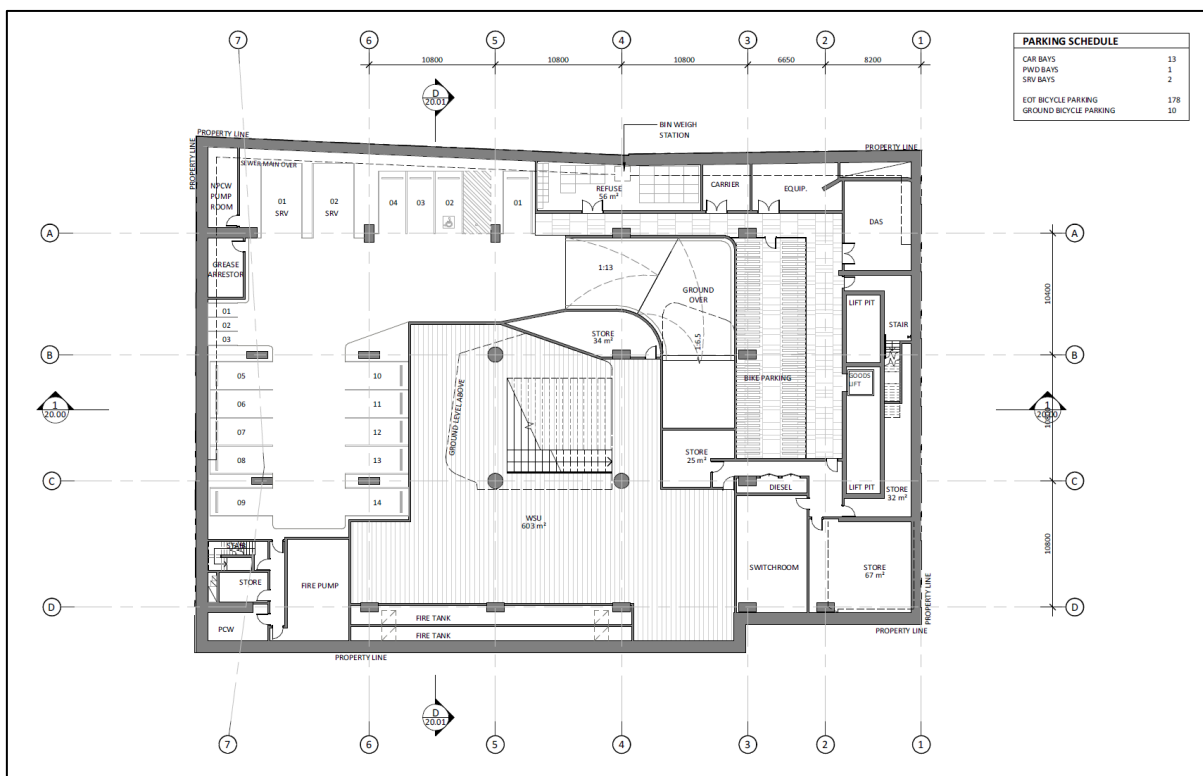


Figure 2: Proposed Basement

3 Existing Site Conditions

3.1 Location

The site is located at 2-6b Hassall Street, Parramatta within the City of Parramatta Local Government Area (LGA). The Site comprises three allotments of land with a combined area of 2,647m² and is legally described as Lot 22 in DP608861, Lot 62 in DP1006215 and Lot 7 in DP128820.

The Site has a single road frontage to Hassall Street, with all existing built form being demolished at the time of writing in accordance with the first early works Development Application (DA) 714/2018. The Site will subsequently be excavated in accordance with a second early works DA.

The surrounding development is characterised by a mix of uses and is currently undergoing significant urban regeneration. To the north is the State and Commonwealth heritage listed Lancer Barracks. To the east is the basement driveway to the Curtis Cheng Centre (NSW Police Headquarters) and the PCYC site which is currently subject to a Planning Proposal for a new mixed-use development up to 192m in height. To the south, on the opposite side of Hassall Street is the Eclipse commercial tower (1-3 Hassall Street), a low rise residential flat building (5 Hassall) and a low rise commercial building (7 Hassall Street). The Site adjoins the Commercial Hotel to the west which is a local heritage item.

The Site is located at the eastern end of the Parramatta CBD and is in close proximity to the Parramatta Rail Station and Transport Interchange (100m to the west) and the Parramatta Square urban renewal precinct (250m to the north west).

The Site in its local context is shown in **Figure 3** and **Figure 4** provides a photograph of the Site from Hassall Street.



Figure 3: Local Site Context



Figure 4: Site from Hassall Street

3.2 Existing Development and Site Accesses

The Site has historically comprised of a commercial development to the west and a residential development to the east. As noted, this development is being demolished at the time of writing and the Site is being cleared for this SSDA.

The Site currently has 3 vehicular accesses from Hassall Street, including:

- An access driveway close to the Site's western boundary which is approximately 4.5m wide;
- An access driveway located centrally along the Site's Hassall Street frontage, to the east of the former commercial building (though this access driveway has not been utilised for a number of years); and
- An access driveway near the Site's eastern boundary, adjacent to the neighbouring Police Headquarters driveway, which is approximately 3.0m wide.

4 Strategic Context

4.1 Introduction

Given the significance of the Parramatta CBD, reference has been made to the state, regional and local planning documents that are considered relevant to the context of the Site. These key, reference documents and policies are discussed in the following sections.

4.2 Future Transport Strategy 2056

Future Transport Strategy 2056 was released in March 2018. It is an update of the 2012 Long Term Transport Master Plan for NSW. Future Transport 2056 is supported by a suite of plans for regional NSW and for Greater Sydney. As shown in **Figure 5**, the Strategy identifies that planning and investment for Greater Sydney will focus around the three cities concept – the Western Parkland City, the Central River City and the Eastern Harbour City, where people can access the majority of jobs and services within 30 minutes. It will require a sustained and staged investment program to protect corridors and then develop an integrated transport system that includes:

- City-shaping corridors: Major trunk road and public transport corridors providing higher speed and volume connections between our cities and centres that shape locational decisions of residents and businesses.
- City-serving corridors: Higher density corridors within 10km of metropolitan centres providing high frequency access to metropolitan cities/centres with more frequent stopping patterns
- Centre-serving corridors: Local corridors that support buses, walking and cycling, to connect people with their nearest centre and transport interchange
- Freight network: The most significant corridors that support the movement of goods.

The Site is located within Greater Parramatta region, which is at the core of the Central River City. The development of the Central River City will require improved 30 minute public and active transport access to Greater Parramatta. To support this, the focus will be on new city-shaping connections, particularly from the north and south. A new light rail network for Greater Parramatta will also support local access and urban renewal.

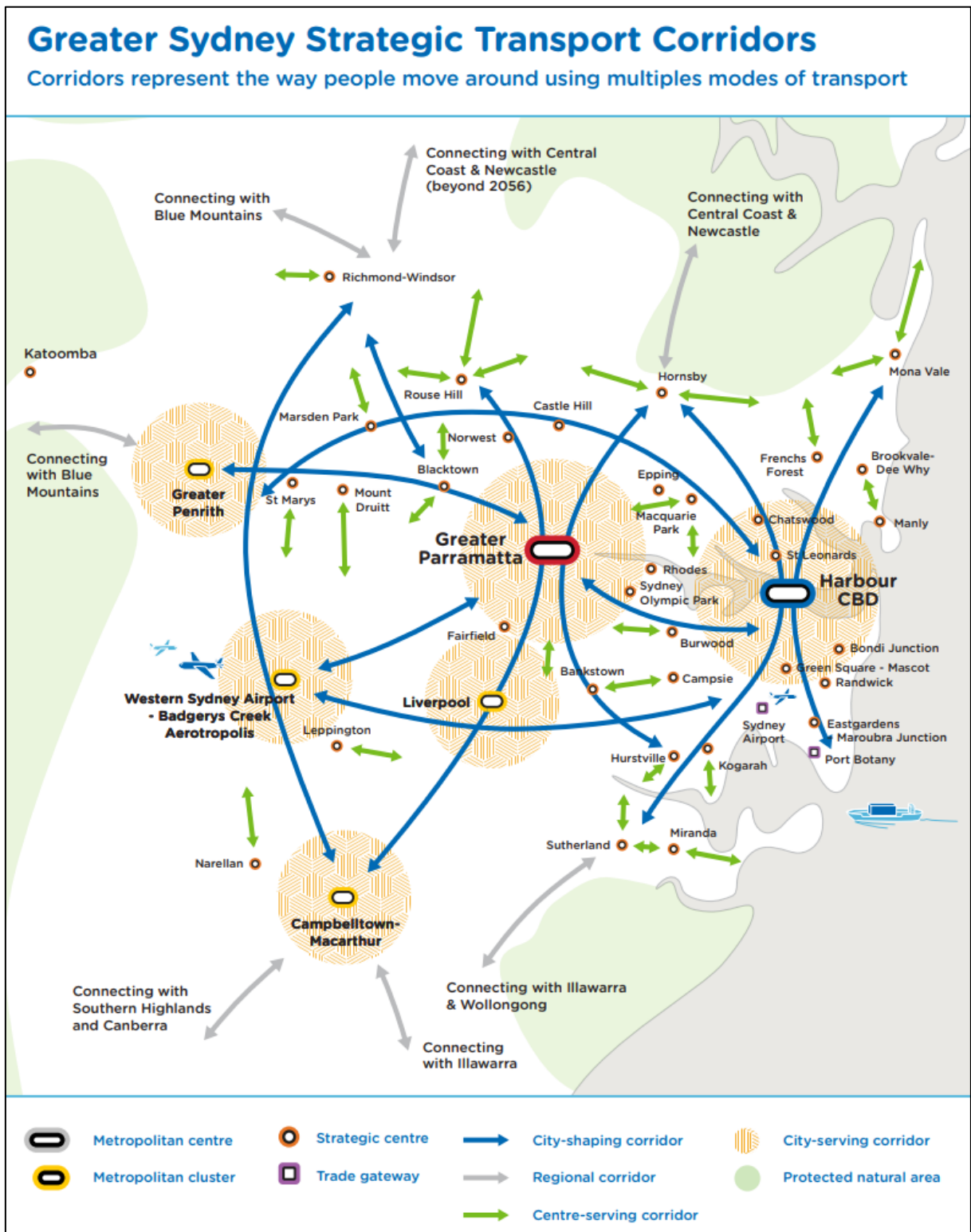


Figure 5: Greater Sydney Strategic Corridors

4.3 Greater Sydney Regional Plan (2018)

The Greater Sydney Region Plan: *A Metropolis of Three Cities – connecting people* (2018) has been produced by the Greater Sydney Commission. Its purpose is to:

“...rebalance growth and deliver its benefits more equally and equitably to residents across Greater Sydney. The plan aligns land use, transport and infrastructure planning to reshape greater Sydney as three unique cities”

Based on a vision of three connected cities – the Eastern Harbour City, the Central River City and the Western Parklands City – the Region Plan is structured around strategies for infrastructure, collaboration, liveability, productivity, sustainability and implementation across Greater Sydney. **Figure 6** identifies the key strategies to achieve the outcomes for the Central River City, where the Site is located.

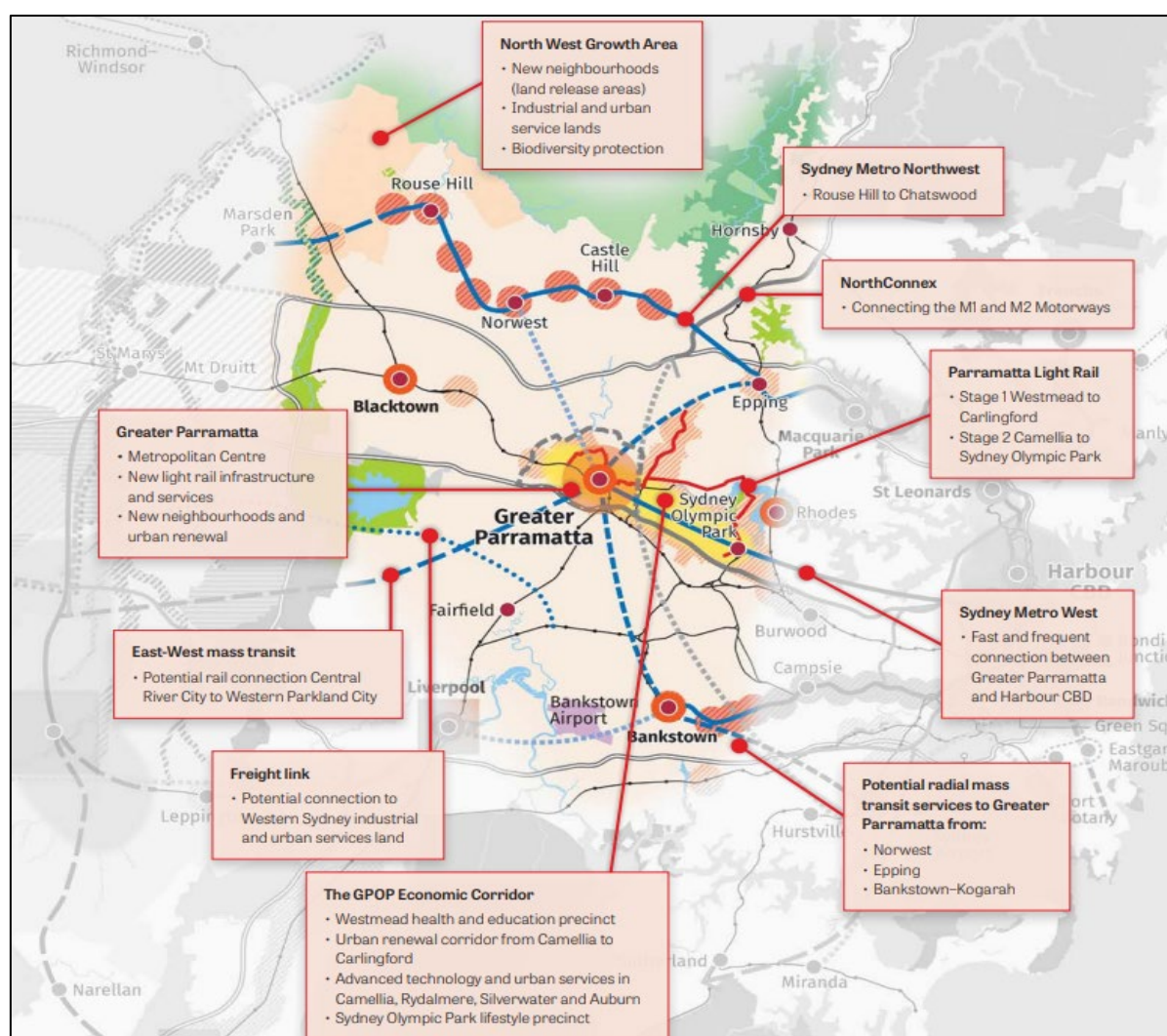


Figure 6: Central River City – Key Strategies

The Region Plan was prepared concurrently with the future Transport Strategy 2056 and the State Infrastructure Strategy to ensure the alignment of land use, transport and infrastructure outcomes for Greater Sydney. It seeks to encourage residential development in close proximity to employment areas to deliver a series of 30-minute cities, providing better access to jobs, schools, and health within 30 minutes of people's homes.

Objective 14 of the Region Plan aims to integrate land use and transport to create walkable and 30-minute cities. One element required to achieve this aim is to co-locate activities in metropolitan, strategic and local centres and attract housing in and around centres to create walkable neighbourhoods.

Objective 21 of the Region Plan focuses on "*innovation precincts*", with 21% of all jobs in Greater Sydney are projected to be in health and education sectors by 2036. Greater Parramatta has been designated as a Health and Education Precinct which will serve an essential role in the community as places to work, learn and access services. Strategy 21.1 indicates that land use and infrastructure plans for health and education precincts are to:

- Have high levels of accessibility
- Attract associated businesses, industries and commercialisation of research

The Site is ideally located to align with the aims of the Region Plan as it located close to Parramatta's residential areas and is situated directly within Parramatta CBD making it readily accessible by bus and train. The Site's relationship with the surrounding land uses mean that travel by non-car modes can easily be encouraged with access to jobs and key services possible within 30 minutes.

4.4 Sydney's Bus Future

Sydney's Bus Future, December 2013 outlines the NSW Government's long term plan for the bus network to meet customer needs. The proposed upgrade for the Sydney bus network will include the addition of new rapid bus routes while maintaining and improving elements of the existing bus network, such as cross-city services on Metro bus routes.

Rapid bus routes will offer faster and more reliable bus travel for commuters between major city centres as extra services are planned to be implemented and bus stops to be further dispersed along routes (generally spaced 800 metres to one kilometre apart). Existing suburban and local service routes will continue to provide commuter access to local, neighbourhood destinations. An additional 20 suburban routes are to be introduced. Proposed network upgrades would fill the gaps in the heavy rail network, strengthening links from the Parramatta region to areas including Norwest, Castle Hill, Macquarie Park, Ryde, Bankstown, and Liverpool.

The proposed rapid bus routes include:

- Castle Hill to Liverpool via Parramatta
- Parramatta to Sydney CBD via Ryde
- Rouse Hill to Hurstville via Parramatta and Bankstown
- Mona Vale to Sydney CBD
- Maroubra Junction to the Sydney CBD
- North Bondi to the Sydney CBD
- Castle Hill to the Sydney CBD.

The proposed rapid bus routes connecting with Parramatta are shown in **Figure 7**.

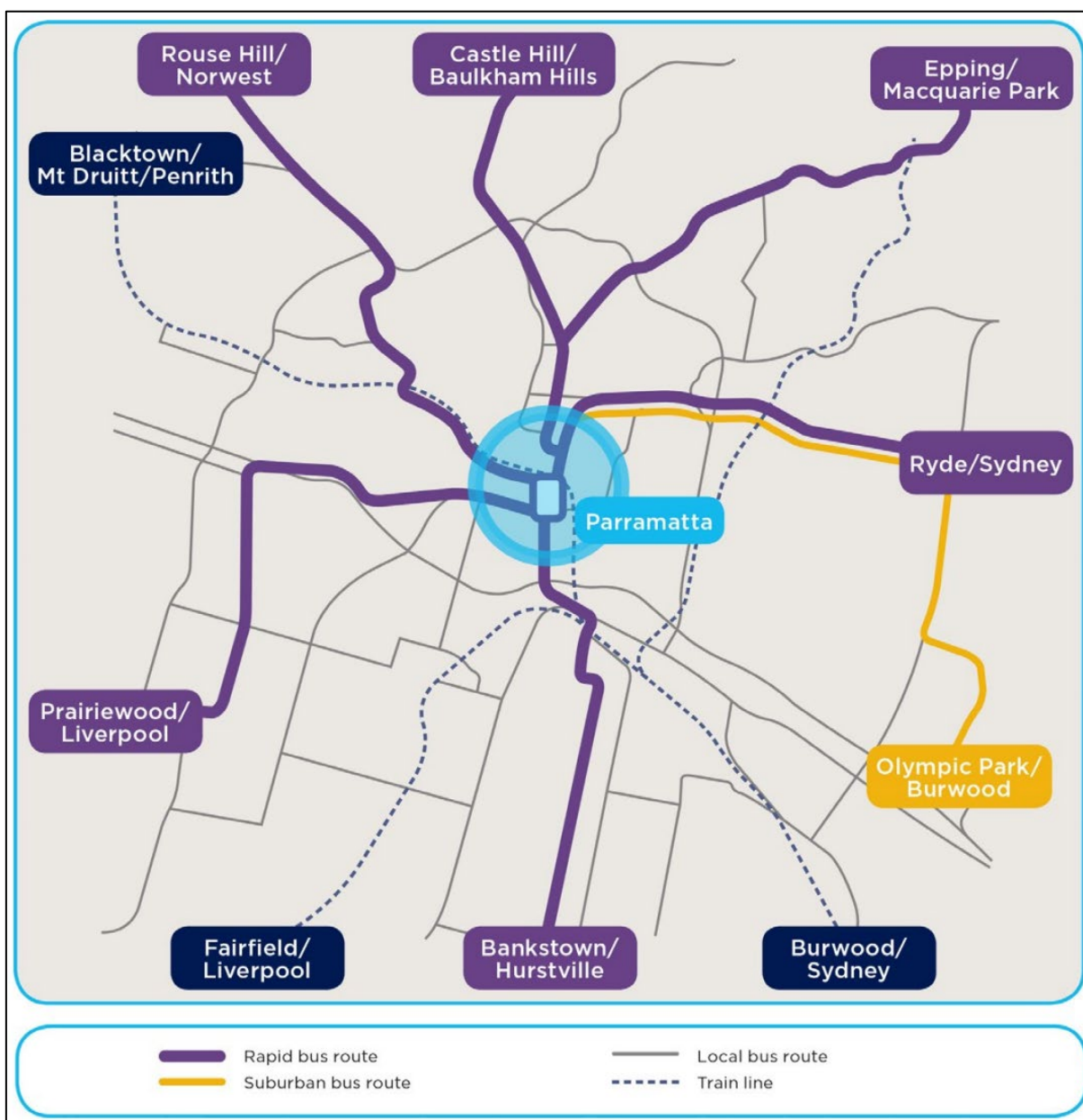


Figure 7: Rapid and Suburban Bus Routes Supporting Parramatta

Transport for NSW (TfNSW) has indicated that future bus timetabling is expected to include significant increases to the number of bus services along the North-West T-way, which extends along Mons Road, east of the Site, and continues down Darcy Road towards Parramatta.

4.5 Parramatta Light Rail

Parramatta Light Rail (PLR) is one of the NSW Government's latest major infrastructure projects being delivered to serve a growing Sydney. Stage 1 will connect Westmead to Carlingford via Parramatta CBD and Camellia with a two-way track spanning 12 kilometres. This will be the first stage of the Parramatta

Light Rail project and is expected to open in 2023. The route will link Parramatta's CBD and Train Station to the Precinct, Parramatta North Urban Transformation Program, the new Western Sydney Stadium, the Camellia Precinct, the new Powerhouse Museum and Riverside Theatres Cultural Hub, the private and social housing redevelopment at Telopea, Rosehill Gardens Racecourse and three Western Sydney University campuses.

Figure 8 shows the proposed stops in relation to the Precinct and Site in Stage 1.

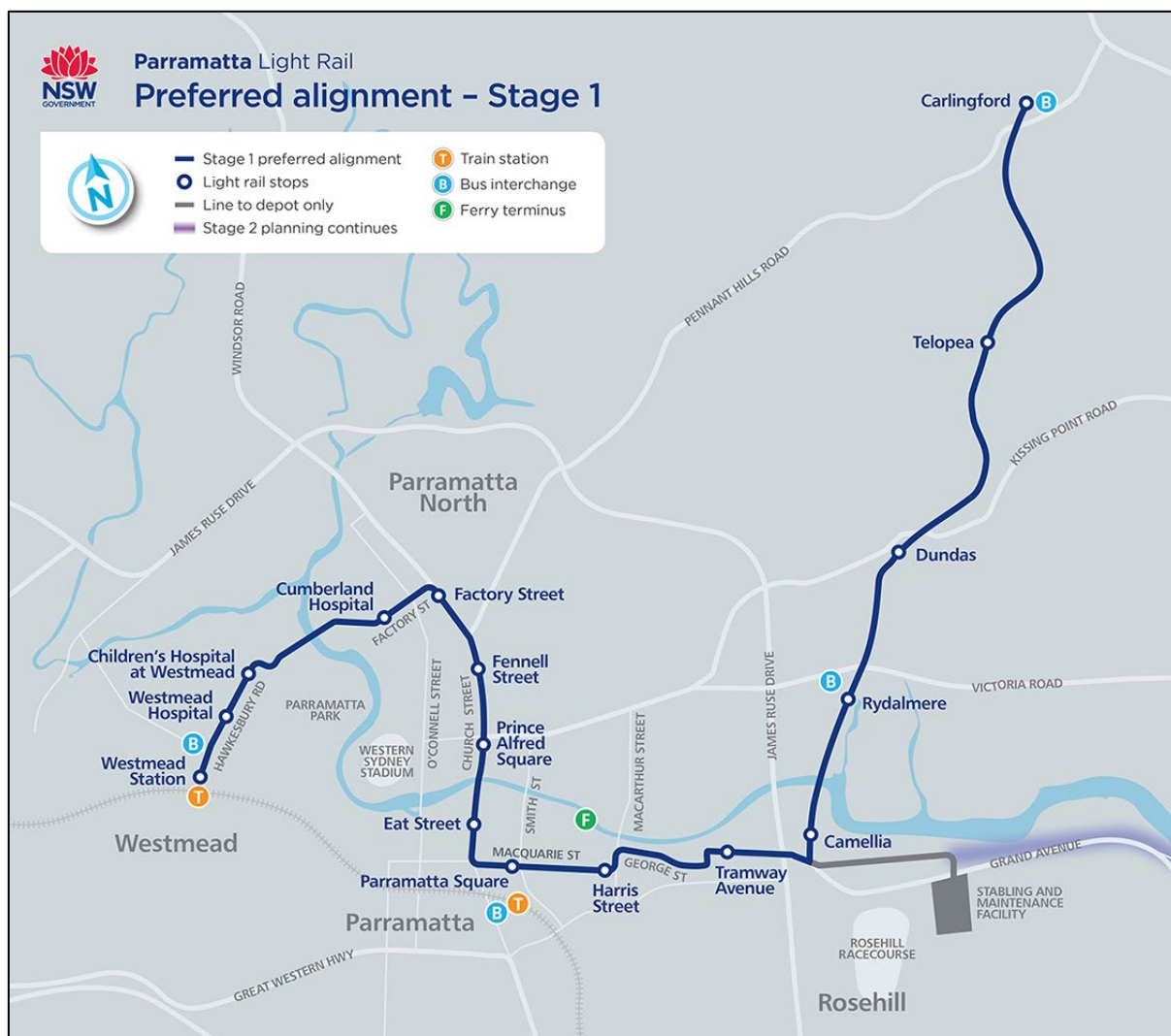


Figure 8: Parramatta Light Rail – Stage 1

In October 2017 the NSW government announced the preferred route for PLR Stage 2, which will connect to Stage 1 and run north of the Parramatta River through the rapidly developing suburbs of Ermington, Melrose Park and Wentworth Point to Sydney Olympic Park, providing a new public transport option to this booming sport, entertainment and employment hub. An option for extending east through Camellia before crossing the Parramatta River to Rydalmere is being considered. Stage 2 will be further developed through consultation with the community and stakeholders. A final business case for Stage

2 is expected to be released soon with an investment decision and details on the timing of construction to follow.

Figure 9 shows the proposed routes for Stages 1 and 2.

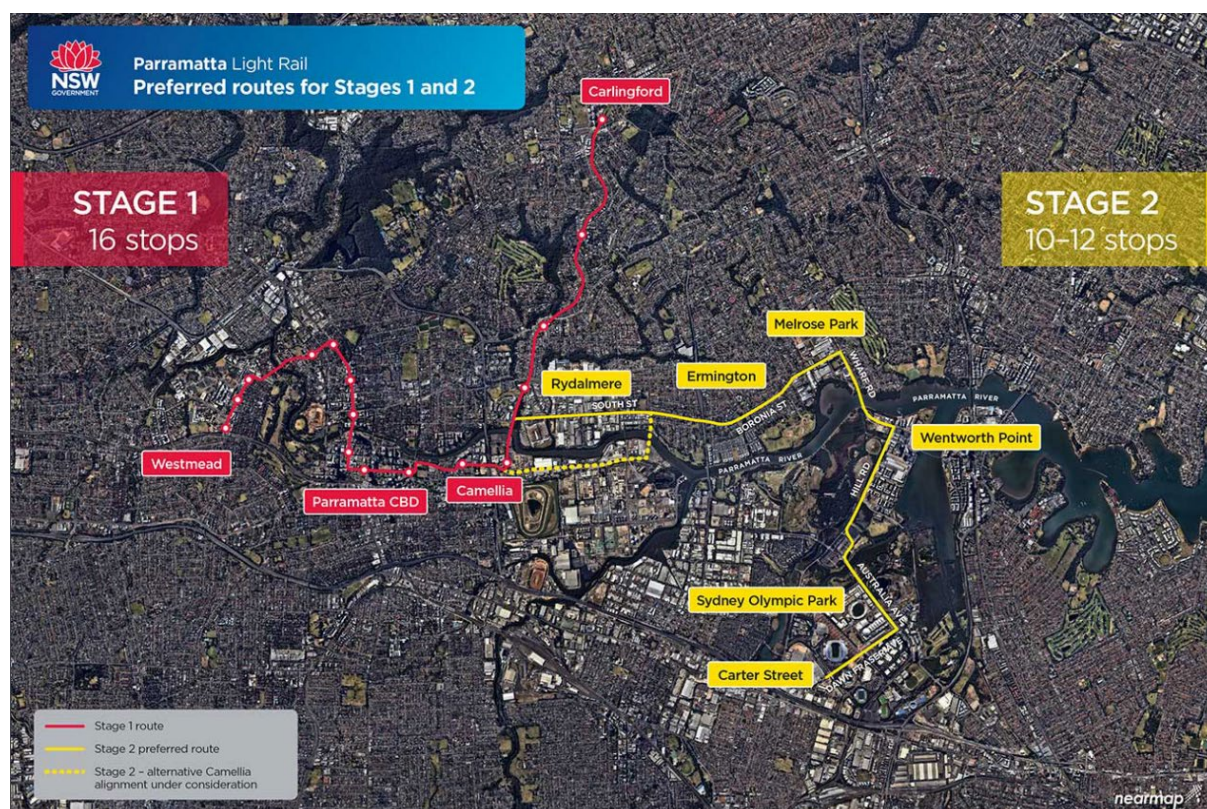


Figure 9: Parramatta Light Rail – Stages 1 and 2

4.6 Sydney Metro West

The Sydney Metro West is underground rail system announced by the NSW Government on November 2016. The project aims to provide a high level of connectivity between the key precincts of Greater Parramatta, Sydney Olympic Park, The Bays Precinct and the Sydney CBD.

At a local context, the Sydney Metro West system will provide a new underground station at Westmead, which seeks to support the growth and development of the Westmead Precinct. Noting that the project is still at a planning stage, the precise location of the new station is yet to be confirmed. **Figure 10** identifies the study area for the Sydney Metro West network and the approximate locations of the stations.

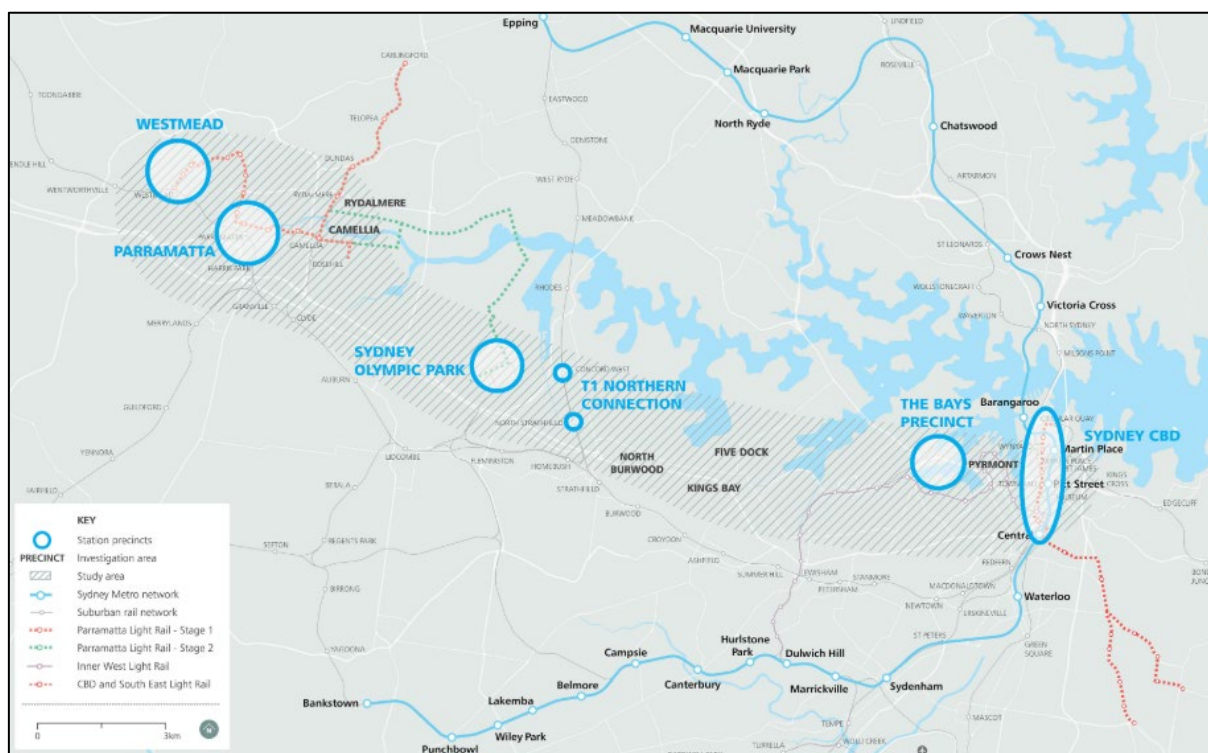


Figure 10: Sydney Metro West Study Area

4.7 Greater Parramatta Growth Area

Greater Parramatta has been recognised as undergoing rapid growth and being currently planned for within the Interim Land Use and Infrastructure Implementation Plan (the Interim Plan). This document was developed in conjunction by the Department of Planning and Environment (DPE), Parramatta Council and the Greater Sydney Commission (GSC). The Interim Plan recognises the strategies, plans and policies to provide a connected, vibrant city with emphasis on homes, jobs, infrastructure, public and active transport.

Locally, Parramatta CBD is one of the twelve precincts identified as part of the Greater Parramatta Growth Area to be investigated. The Interim Plan forecasts an increase of approximately 48,763 jobs and an additional 20,297 homes by 2036. For the purpose of consistency, the Interim Plan proposes to establish the Greater Parramatta Priority Growth Area (shown in **Figure 11**) by including it in the State Environmental Planning Policy (Sydney Region Growth Centres) 2006.

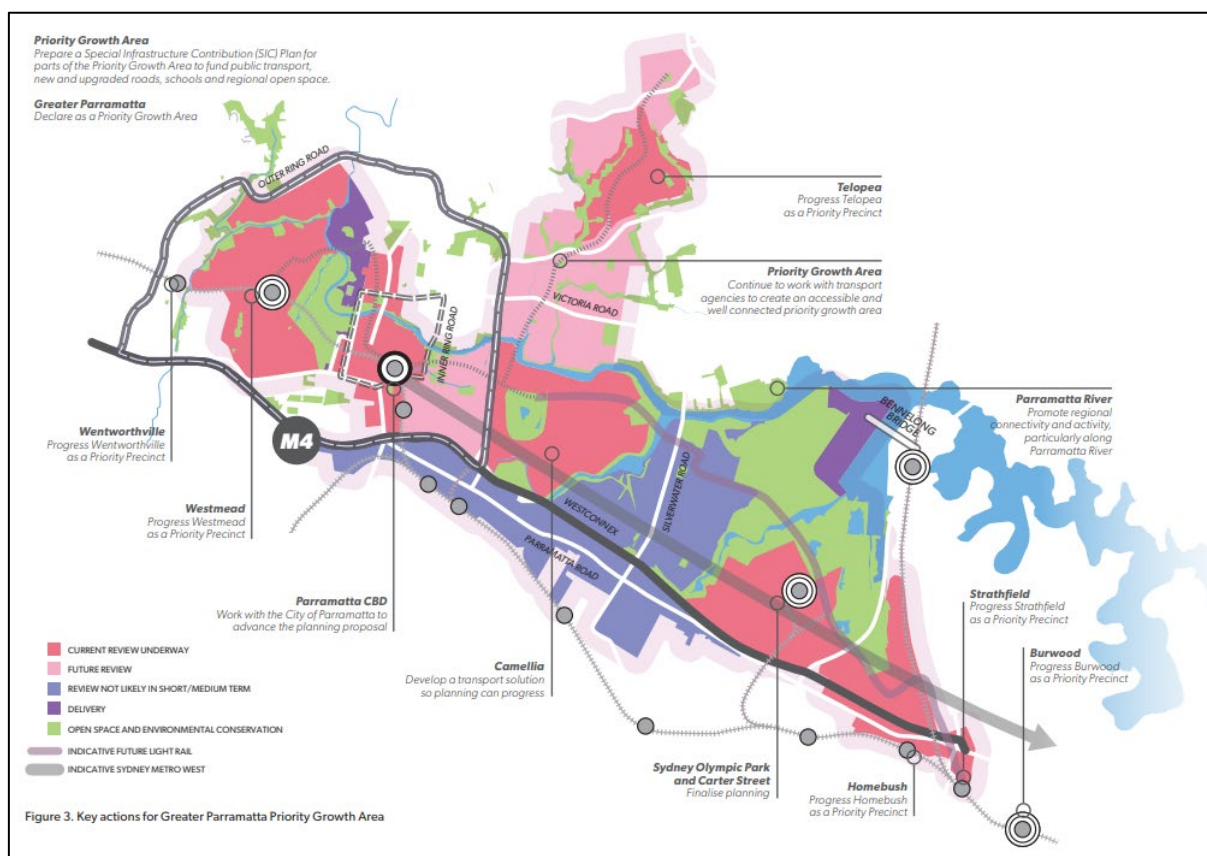


Figure 11: Great Parramatta Growth Area

4.8 Greater Parramatta to the Olympic Peninsula (GPOP)

The Greater Parramatta to the Olympic Peninsula (GPOP) has been recognised as a growing city by the Greater Sydney Commission (the Commission), with the intention of providing a 20 year plan to ensure that the area can be a successful inner-urban hub. The GPO area is divided into four areas, as outlined in **Figure 12**:

- Parramatta CBD and Westmead Health and Education Super Precinct;
- Next Generation Living from Camellia to Carlingford;
- Essential Urban Services, Advanced Technology and Knowledge Sectors in Camellia, Rydalmere, Silverwater and Auburn; and
- Olympic Park Lifestyle Super Precinct.

The Commission has collaborated with City of Parramatta Council, institutions, business and the local community throughout 2016 to gather input and feedback for future planning. This approach, named the Growth Infrastructure Compacts, intends to prepare for forecast job and housing growth with a timely and cost effective delivery method.

The Site is located in the Parramatta CBD and Westmead Health and Education Super Precinct. A key objective of the area is to create a '30-minute city,' which is characterised by providing strong connectivity to all areas within the catchment area. It is planned to utilise all forms of transport, such as heavy rail, metro, light rail, road, ferry, cycling and walking.

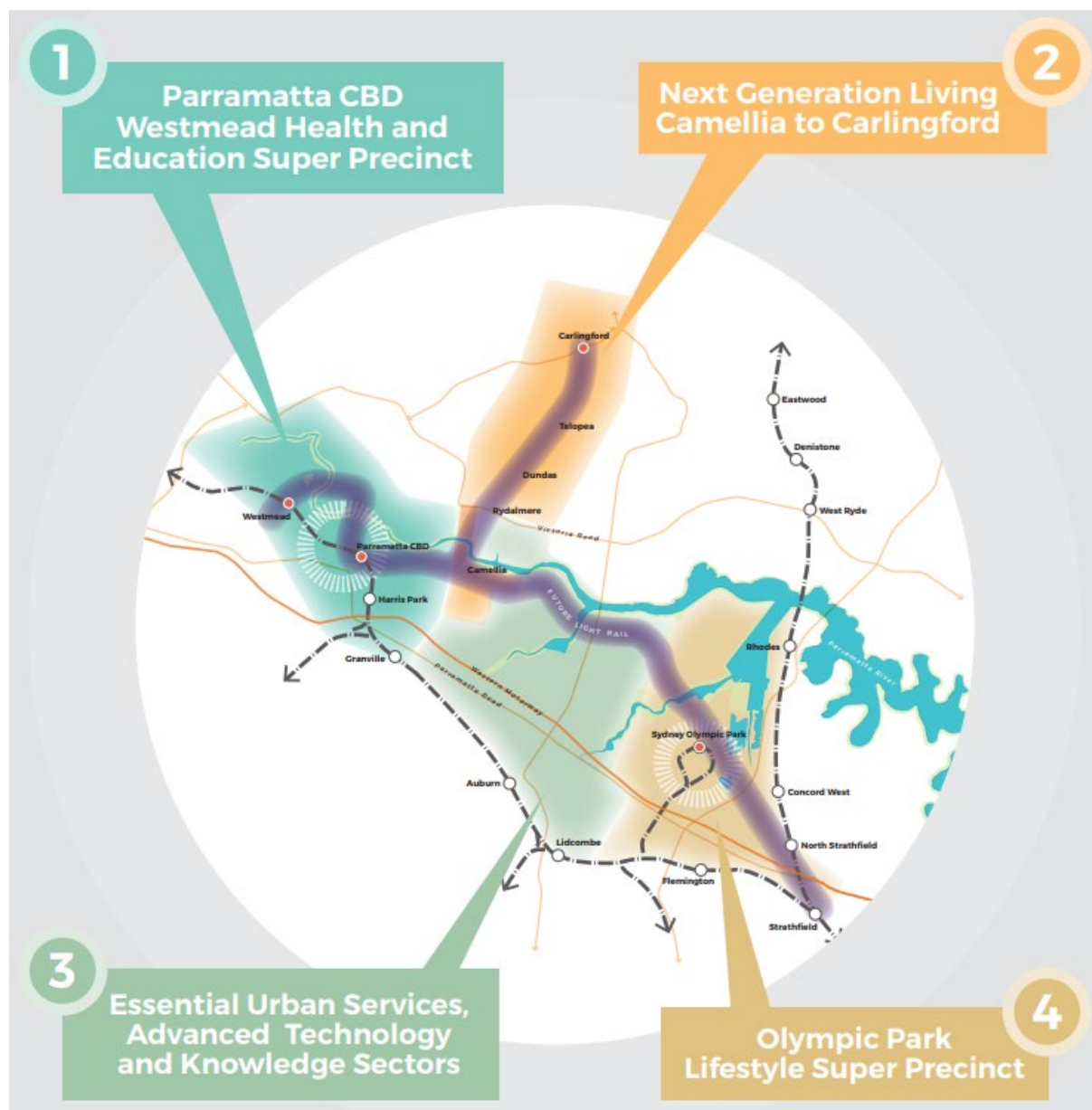


Figure 12: Greater Parramatta to the Olympic Peninsula (GPOP)

4.9 The Parramatta CBD Planning Strategy (2015)

Council is facilitating job and dwelling growth in Parramatta city centre, so it can reach its full potential as a dual CBD to Sydney's city centre. To manage the significant growth Council prepared a Planning

Proposal to provide for an “*expanded and more intense commercial core...to support the CBD as a vibrant centre by surrounding the core with higher density mixed use*”.

The Parramatta CBD Planning Strategy (2015) sets the visions, principles, actions and implementation plan to deliver a new planning framework for the Parramatta CBD. The Strategy’s vision states ‘*Parramatta will be Australia’s next great city...with strong connections to regional transport*’. The Strategy commits Council to investigating the required regional and local transport infrastructure upgrades required to facilitate the growth of the CBD across public domain improvements, including new CBD spaces and street upgrades and access and transport improvements, including light rail, as shown in **Figure 13**.

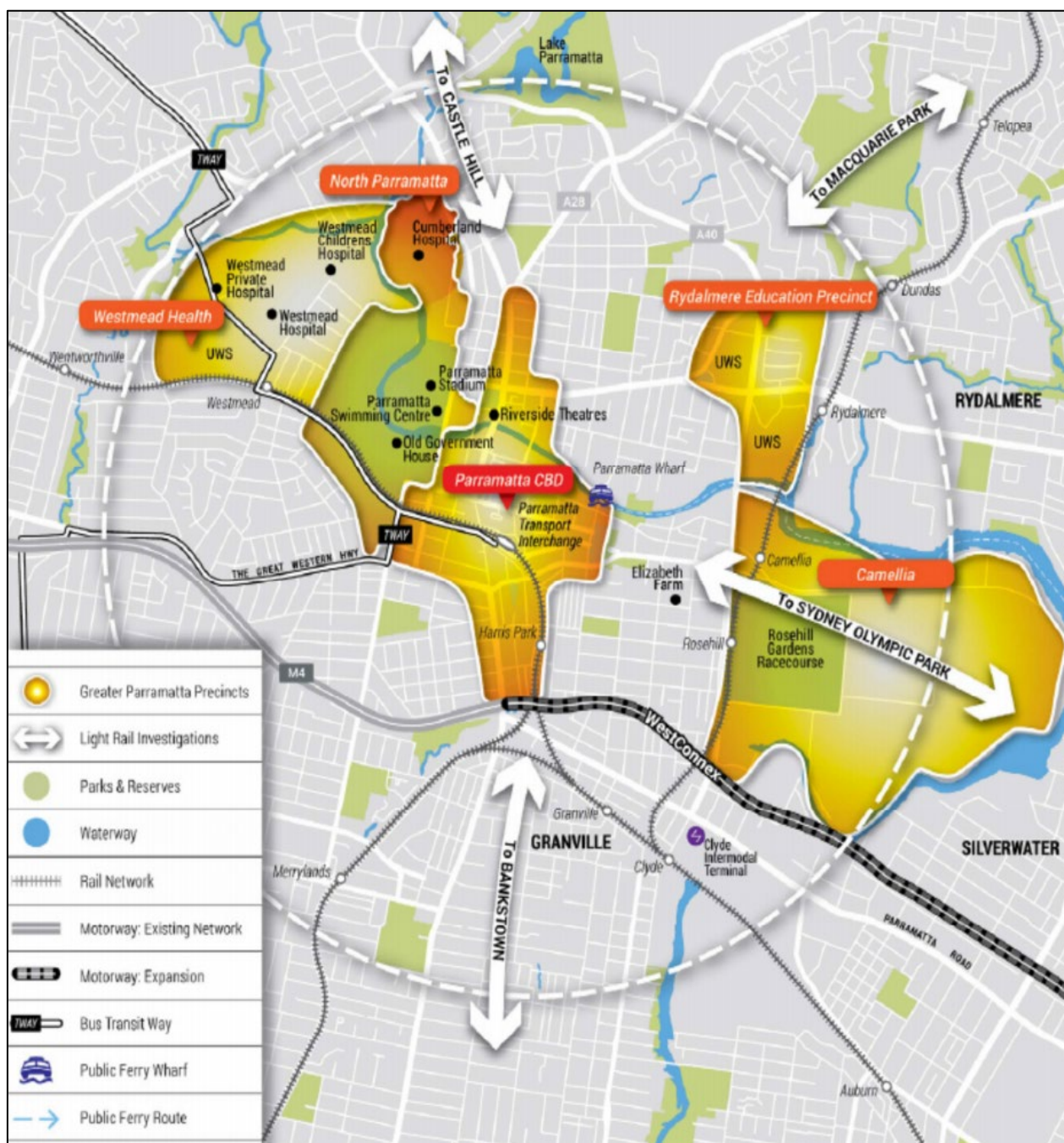


Figure 13: Greater Parramatta

4.9.1 Parramatta CBD Strategic Transport Study

AECOM undertook the Parramatta CBD Strategic Transport Study (2016) (the Transport Study) on behalf of Council to inform a new Integrated Transport Plan. It identified the transport implications of the proposed growth and the interventions required to support the future Parramatta CBD.

The Transport Study includes a series of actions such as integrating urban, building and transport functions when designing future development; improving the walking experience in order to help achieve a mindset shift toward walking in the city; and to implement restrictive parking policies.

Action 6.5 of this strategy aims to integrate a safe walking network into the planning and delivery of all precincts.

The purpose of Action 14 is to improve the walking experience to achieve a mindset shift towards walking in the city, including providing sufficient footpath width as well as investigating the permeability of the CBD and utilising new development as a means to improve it with new through links.

Action 15 facilitates restrictive parking policies, with Action 15.1 stating that there is a need to “*reduce overall parking supply, particularly for commute trips*”.

A strong focus of the Transport Study sought to ensure that the sustainable development of the CBD, including encouraging sustainable transport modes and restraining car parking provisions, which will offset new vehicular trips that could be generated as a result of the growth.

As is stated in the Transport Study, Parramatta’s CBD rates of parking provision are around four to five times higher than other benchmark CBDs in Sydney. To encourage sustainable travel and discourage private vehicle use, there will need to be a significant reduction in current parking provision rates, to bring Parramatta CBD more in line with those employed in other benchmark CBDs.

4.9.2 The Integrated Transport Plan for Parramatta City Centre (2010)

The Integrated Transport Plan for Parramatta City Centre (2010) indicated that the key issue for Parramatta city centre is moving away from the reliance of car use towards more sustainable transport of walking, cycling and public transport. The sustainable transport objectives for the CBD are:

- Promote and support walking, cycling and sustainable travel change
- Support and facilitate public transport use
- Manage traffic to minimise its adverse impacts especially car commuters and through traffic

4.9.3 Parramatta CBD Pedestrian Strategy (2017)

Parramatta CBD pedestrian Strategy (2017) (Strategy) states its vision to deliver a CBD that will enhance the walking experience in the CBD. The Strategy aims to guide Council in planning for streets and city areas that are accessible, safe and prioritised for pedestrians. The objectives outlined in the Strategy are:

- Prioritise the time, safety and amenity of pedestrians
- Enhance and activate spaces and streets, supporting the CBD's economy
- Capitalise on the transformation of the CBD to benefit pedestrians
- Improve the current and future pedestrian network
- Grow walking mode share and support the use of public transport
- An ongoing commitment to promote walking

A range of actions have been recommended within the Strategy to align with the walkable CBD principles and to achieve the strategic walking objectives. This includes infrastructure and operations actions, which will facilitate more traffic calming measures, pedestrian priority, improved perceptions of safety and direct paths of travel.

The strategy aims to ensure the acceptance that pedestrian movements and space are to be more important than private vehicles throughout the CBD.

5 Existing Road Network

5.1 Road Hierarchy

The key roads in the vicinity of the Site are shown in **Figure 14** and are summarised below:

- **Parkes Street:** A RMS secondary road (SR2049) which is designated a sub-arterial road located south of the Site. The road provides an east-west connection between the Great Western Highway and Hassall Street to the east. It generally carries two lanes of traffic in each direction with a speed limit of 60km/hr and no on-street parking spaces. The road provides a critical link under the Parramatta rail line that divides the Parramatta CBD.
- **Hassall Street:** A local road that forms the southern street frontage of the Site that goes in east-west direction. The road eventually becomes an RMS secondary road (SR2049) from the intersection of Parkes Street to James Ruse Drive. The Site's street frontage consists of one-way westbound traffic lanes with a bicycle lane to the north. On-street parking spaces are available along the south side of the road.
- **Station Street East:** A collector road to the north and a local road to the south that traverses in a north-south direction to the west of the Site. The road forms an intersection with Hassall Street to the west of the Site. Bus lanes are painted in both directions in the northern segment of Station Street East.
- **Charles Street:** A local road that travels in a north-south direction to the west of the Site, intersecting at Hassall Street. The road generally carries one or two lanes of traffic in each directions with on-street parking spaces. A school zone is located to the north of Charles Street and a bus staging area to the south.
- **Great Western Highway:** A state road (HW5) that is located to the west of the Site that traverses in an east-west direction between Sydney CBD to Penrith. In the vicinity of the Site it provides two or three 3 traffic lanes to each direction.

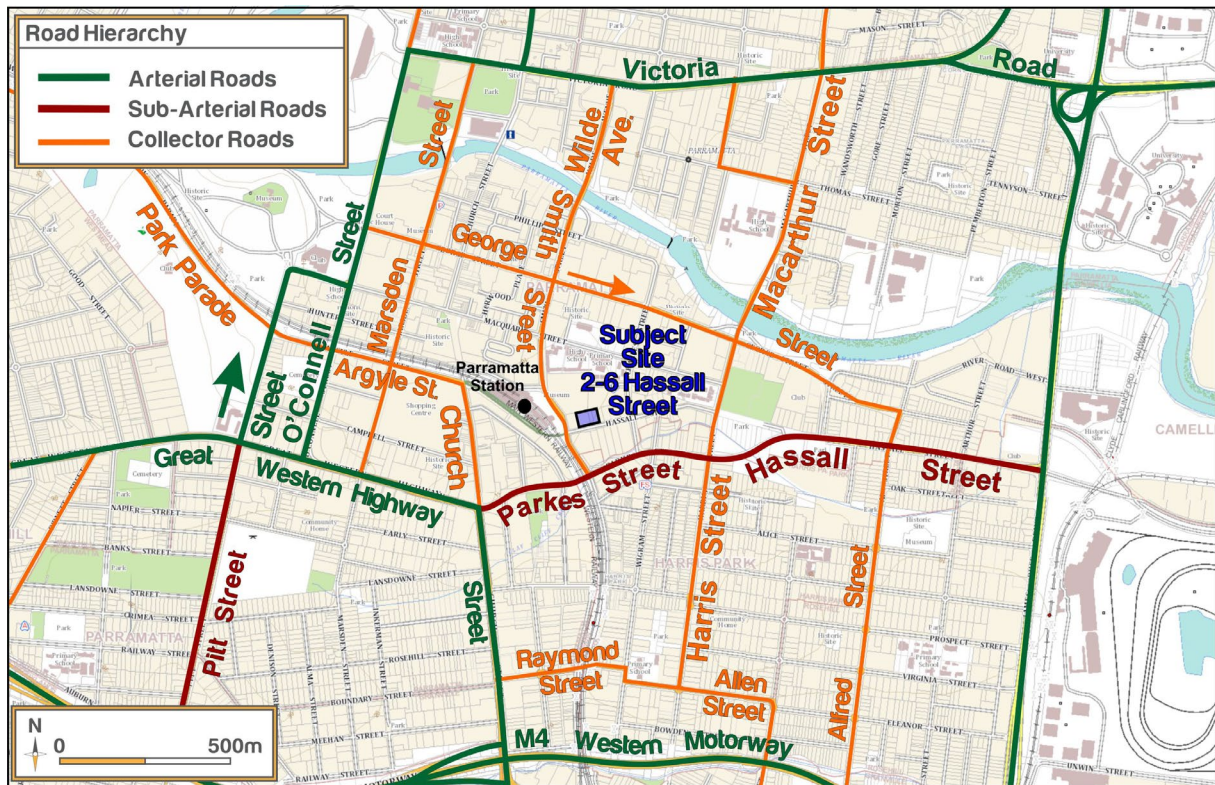


Figure 14: Site and Road Hierarchy

5.2 Traffic Surveys

Traffic surveys were undertaken at the intersections of Station Street / Hassall Street / Argyle Street and Hassall Street / Charles Street during extended AM (6:00am – 10:00am) and PM (3:00pm – 7:00pm) peak periods. Peak hour traffic flows are summarised in the figures below.

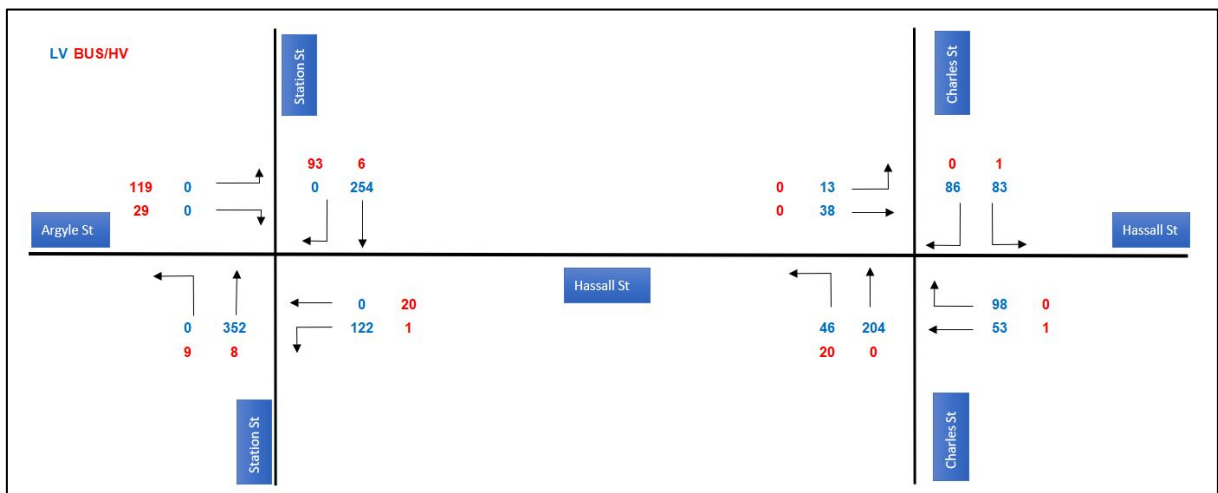


Figure 15: Existing AM Peak Traffic Flows

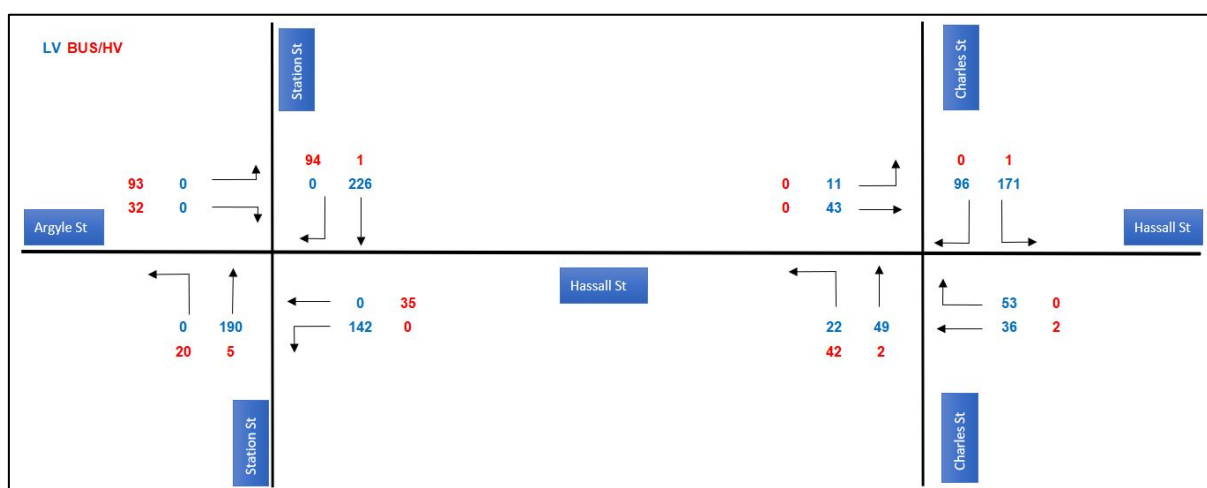


Figure 16: Existing PM Peak Traffic Flows

It is noted that each intersection was assessed individually based on its own AM and PM peak hour traffic flows such that the worst-case scenario can be assessed.

The following details the total movements during the key peak AM and PM periods:

- **Argyle Street / Hassall Street / Station Street:**
 - 3,051 vehicles during the AM Peak between 6.00 – 10.00AM
 - 3,046 vehicles during the PM Peak between 3.00M – 7.00PM
- **Charles Street / Hassall Street:**
 - 1,934 vehicles during the AM Peak between 6.00 – 10.00AM
 - 1,852 vehicles during the PM Peak between 3.00 – 7.00PM

5.3 Intersection Analysis

The key intersections of Station Street / Hassall Street / Argyle Street and Hassall Street / Charles Street have been assessed using the SIDRA intersection model. The SIDRA model provides a number of key outputs for the following performance measures:

- **Degree of Saturation (DOS):** The DOS is defined as the ratio of demand (arrival) flow to capacity.
- **Average Vehicle Delay (AVD):** The AVD (or average delay per vehicle in seconds) for intersections also provides a measure of the operational performance of an intersection and is used to determine an intersection's Level of Service (see below). For signalised intersections, the AVD reported relates to the average of all vehicle movements through the intersection. For priority (Give Way, Stop & Roundabout controlled) intersections, the AVD reported is that for the movement with the highest AVD.

- Level of Service (LOS): This is a comparative measure that provides an indication of the operating performance, based on AVD. For signalised and roundabout intersections, LOS is based on the average delay to all vehicles, while at priority-controlled intersections LOS is based on the worst approach delay.

Table 2 provides a summary of RMS LOS parameters.

Table 2: RMS Level of Service Summary

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

The existing performance of the key intersections is reported in **Table 3**. Full SIDRA reports are provided in **Appendix B**.

Table 3: Existing Intersection Performance

Intersection	Control Type	Period	Degree of Saturation	Average Delay	LOS
Station Street / Hassall Street / Argyle Street	Signals	AM	0.568	26.0	B
		PM	0.544	27.4	B
Hassall Street / Charles Street	Signals	AM	0.712	31.1	C
		PM	0.497	28.1	B

With reference to **Table 3**:

- The intersection of Station Street / Hassall Street / Argyle Street currently operates at a good LOS of B.
- The intersection Hassall Street / Charles Street generally operates at a good LOS though there are capacity constraints in the PM peak hours.

5.4 Accident Data

An analysis of crash statistics from the Transport for New South Wales (TfNSW) Centre for Road Safety database indicates that there was a total of 4 accidents at the intersection of Hassall Street / Charles Street during the 5-year reporting period 2013 – 2017 inclusive. These included a series of crashes ranging from minor to moderate injuries and no fatalities. One (1) crash was recorded directly adjacent to the Site's Hassall Street frontage which was a minor injury involving pedestrians emerging. There were 3 crashes reported at the intersection of Station Street / Hassall Street / Argyle Street in the same 5-year period which resulted in minor to moderate injuries.

Figure 17 details all crash locations in the vicinity of the Site between the years 2013 – 2017 inclusive.

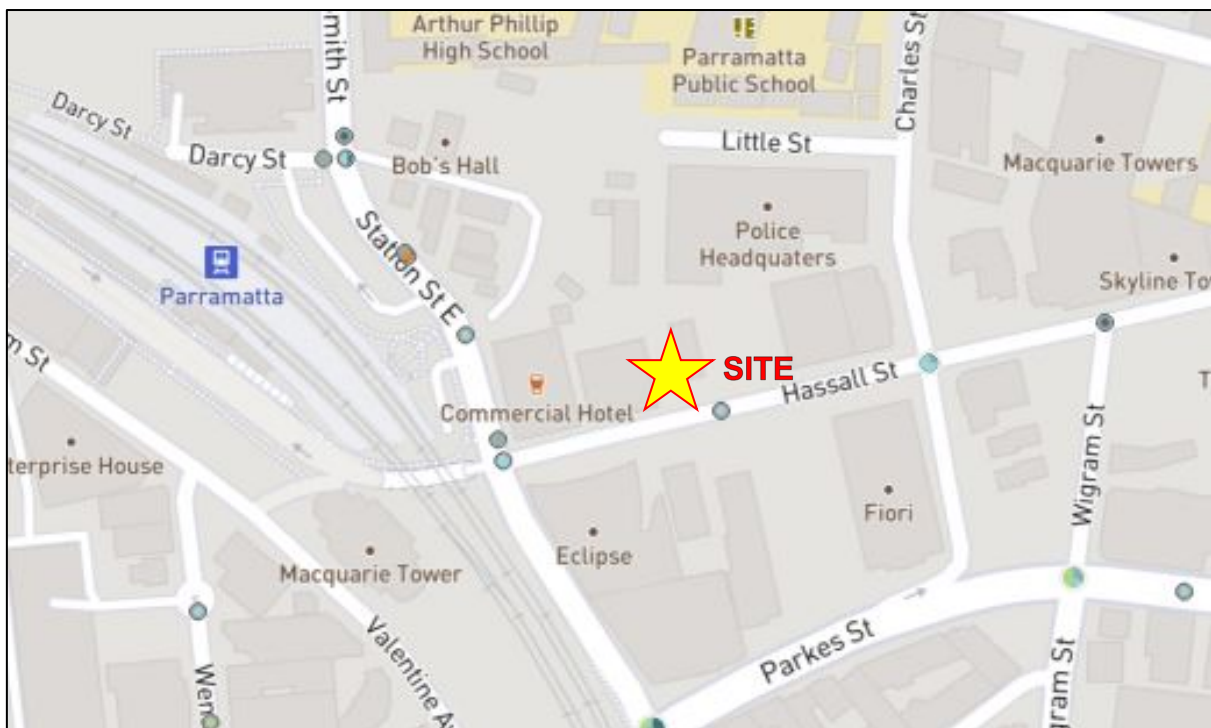


Figure 17: Historical Crash Locations

6 Public Transport

6.1 Public Transport

The Site is well serviced by local public transport infrastructure. The public and active transport local to the Site are presented in **Figure 18** and summarised below.

6.2 Railway Services

The PT Guidelines state that train services influence the travel mode choices of areas within 800 metres walk (approximately 10 minutes) of a train station. In this regard, Parramatta Train Station is approximately 250 metres to the west, within the range of 800 metres as presented in Figure 18. Parramatta Station is a major central train station hub the provides the following frequent services:

- **Sydney Trains Services:**
 - T1 North Shore, Northern & Western Line
 - T2 Inner West & Leppington Line
 - T5 Cumberland Line
- **Intercity Trains Services:**
 - BMT – Blue Mountain Line
 - Western NSW

6.3 Public Bus Services

The PT Guidelines state that bus services influence the travel mode choices of areas within 400 metres walk (approximately 5 minutes) of a bus stop. It is noteworthy that there are bus stops within 400 metres walking distance from the Site on Argyle Street near Parramatta Train Station, Smith Street, Harris Street, Wigram Street and Parkes Street, as shown in **Figure 18**. A major bus interchange is located at Strathfield Station providing an accessible location to transfer to different buses services.

There are thirty-six (36) bus routes within walking distance, which are listed in the following table:

Table 4: Public Bus Services

Bus Number	Route
M52	Metrobus to Circular Quay via Drummoyne
M54	Metrobus to Macquarie Park via Epping
520	To City via West Ryde and Drummoyne
521	To Eastwood
523	To West Ryde via Ermington
524	To West Ryde via Melrose Park
525	To Burwood via Newington
545	To Chatswood via Macquarie University
546	To Epping via Oatlands
549	To Epping via North Rocks
550	To Chatswood via Eastwood
552	To Oatlands
829	North Parramatta to Parramatta Loop
600, M60	To Hornsby via Castle Hill
601	To Rouse Hill via Baulkham Hills, Kellyville
603	To Glenhaven via Rouse Hill
604	To Castle Hill
606	To Winston Hills via Old Toongabbie
609	To North Parramatta
625	To Pennant Hills
706	To Blacktown via Winston Hills
700	To Blacktown
705	To Blacktown
708	To Constitution Hill
711	To Blacktown
T60, T62	To Castle Hill
T61	To Blacktown
T63 – T66	To Rouse Hill
810	To Merrylands
811	To Pemulwuy
T80	T-Way to Liverpool
M91	To Hurstville via Bankstown
M92	To Sutherland via Menai
906	To Fairfield via Guildford
907	To Bankstown via Yagoona
909	To Bankstown via Auburn

6.4 Future Parramatta Light Rail

Stage 1 of the Parramatta Light Rail has been committed and is estimated to be completed by 2023.

Figure 18 details the confirmed alignment of the light rail line along Macquarie Street which will feature two light rail stops within the 400m radius of the Site, i.e. within easy walking distance. The light rail services will have services every 7.5 minutes during the peak AM and PM periods.

The Stage 1 line will run from Westmead to Carlingford via the Parramatta CBD with potential future expansions to Sydney Olympic Park via Ermington for Stage 2.

6.5 Future Sydney Metro West

The future Sydney Metro West will provide metro train services between Westmead via Parramatta and Sydney Olympic Park to the Sydney CBD. While the exact location of the Parramatta Metro Stop is still under planning, it is expected that the Sydney Metro West would provide frequent train services during the peak periods, increasing train capacity between Parramatta and Sydney CBDs.

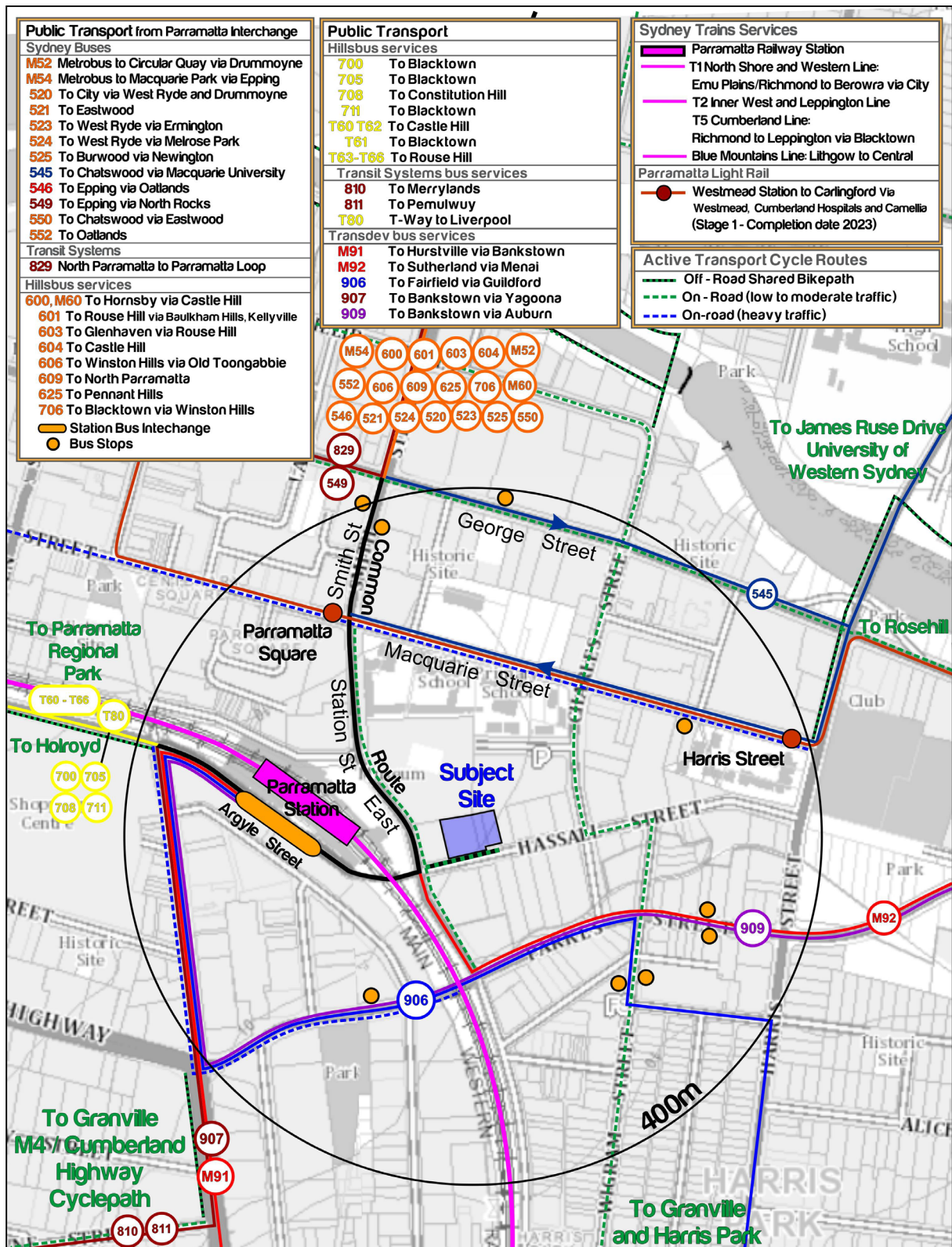


Figure 18: Public Transport Network

6.6 Pedestrian Accessibility

The Site is well serviced in terms of pedestrian infrastructure, with footpaths and appropriate crossings available on all adjacent roads. **Figure 19** details the key pedestrian crossings and the pedestrian desired routes to transport options.

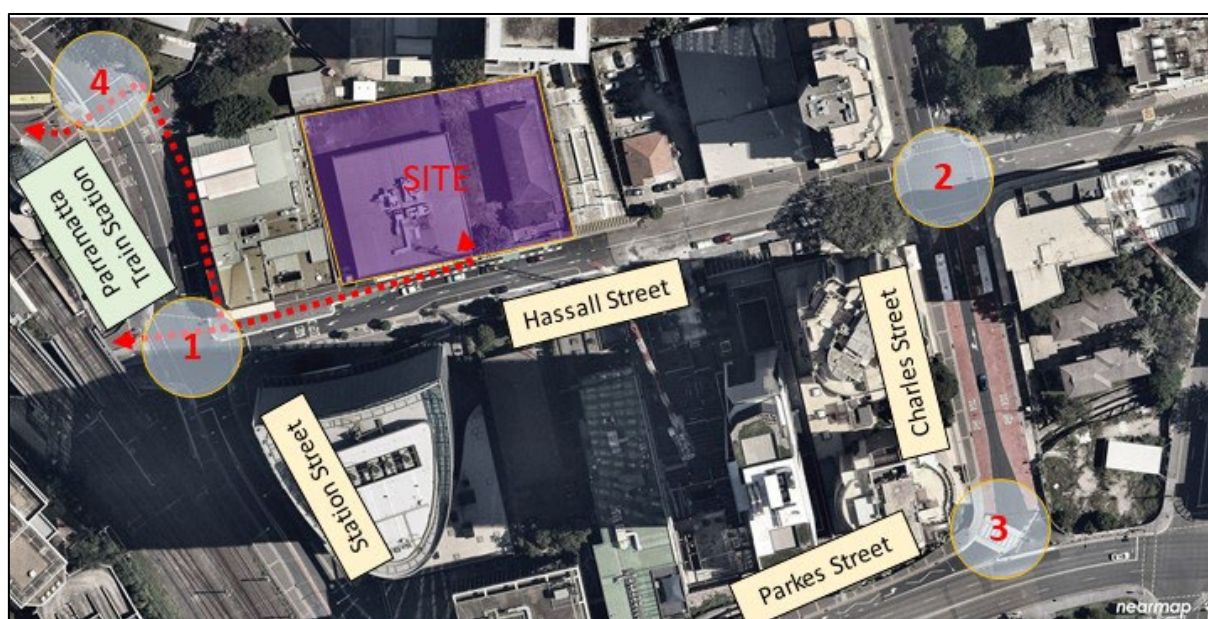


Figure 19: Key Pedestrian Road Crossings and Desired Routes to Transport Options

The following table below details the key pedestrian crossings around the vicinity of the Site in reference to **Figure 19**.

Table 5: Key Pedestrian Crossings

Number Reference	Location	Pedestrian Crossing Description
1	Hassall Street / Station Street / Argyle Street	Signalised crossing
2	Hassall Street / Charles Street	Signalised crossing
3	Charles Street / Parkes Street	Pedestrian Zebra Crossing
4	Station Street / Bus Interchange Access	Signalised crossing

Pedestrian access is provided by footpaths along Hassall Street, Station Street, Charles Street, Parkes Street, Argyle Street and the majority of roads within the Parramatta CBD. These footpaths are generous in width, especially at Hassall Street with footpath widths of 2m and more provided on both sides of the road. Footpaths near Parramatta Station are wide and well-integrated with the street amenities to handle large pedestrian volumes.

Pedestrians from the Site would likely walk along the following routes to access public transport options:

1. Walk along Hassall Street, cross west at the signalised intersection of Hassall Street / Station Street / Argyle Street to head onto Argyle Street to access the Liverpool-Parramatta Transitway to board bus and train services.
2. Head north along Station Street and cross west at the Station Street signalised pedestrian crossing to access the bus interchange and Parramatta Station.

The Site is indeed centrally located near public transport options to encourage walkability and active travel.

6.7 Existing Pedestrian Movements

As discussed, the Site is located in close proximity to the Parramatta Transport Interchange and as such there is a direct pedestrian desire line along Hassall Street, with pedestrian activity along the Site's southern frontage. For this reason, pedestrian count surveys have been undertaken to confirm these site observations. The Site shares an eastern and part northern boundary with the Curtis Cheng Centre – NSW Police Headquarters, which is serviced by an access driveway, being some 13 metres in width. The pedestrian surveys were conducted to help inform the proposed vehicular access principles and to understand impacts to pedestrian movements.

The pedestrian survey was conducted on 23 November 2017 between the hours of 5.00AM and 8.00PM. **Figure 20** summarises the results for the whole survey period, as well as the AM (8.00 - 9.00) and PM (4.30 – 5.30) peak hours.

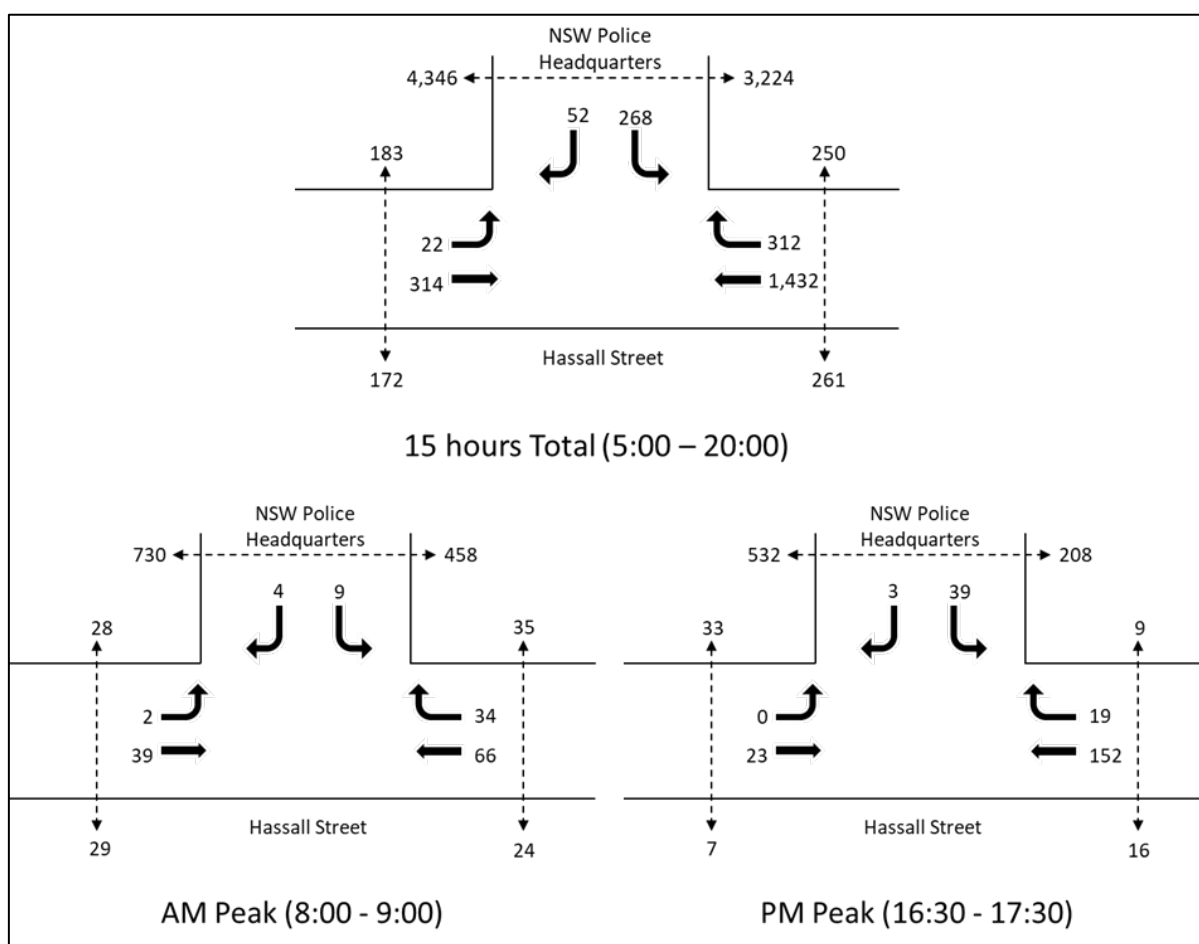


Figure 20: Pedestrian and Traffic Counts Past the Site

With reference to the above, there were approximately 1,188 pedestrians passing the Site's southern frontage in the AM peak period and 740 pedestrians in the PM peak period.

In the AM peak, 730 (or 61%) pedestrians were passing the Site's southern frontage in a west to east direction (from Parramatta Station) and 458 (or 39%) pedestrians were passing in an east to west direction (to Parramatta Station). In the PM peak period, 532 (72%) pedestrians were travelling and 208 (28%) pedestrians were travelling towards Parramatta Station.

As such, the split of pedestrians travelling to and from Parramatta Station remained relatively similar for both peaks, with the larger proportion of pedestrians travelling away from Parramatta Station.

The peak 15-minute period was observed in the morning, between 08.15-08.30AM. During this period, there were 375 pedestrians passing the Site, with 220 travelling from Parramatta Station, and 155 travelling towards Parramatta Station. Over the course of the survey period, 7,570 pedestrians travelled past the Site's southern frontage, with 57% heading away from Parramatta Station and 43% towards Parramatta Station.

6.8 Cycle Routes

Council has provided an extensive cycling network within the Parramatta CBD, including on and off road paths, noting that a dedicated bicycle lane is directly located along the Site's Hassall Street frontage. The Parramatta CBD's cycleway network is shown in **Figure 21** which details the Site's cycling connectivity with the CBD's cycling network. These cycling routes provide key access to Parramatta Park, Parramatta Station and the surrounding suburbs.

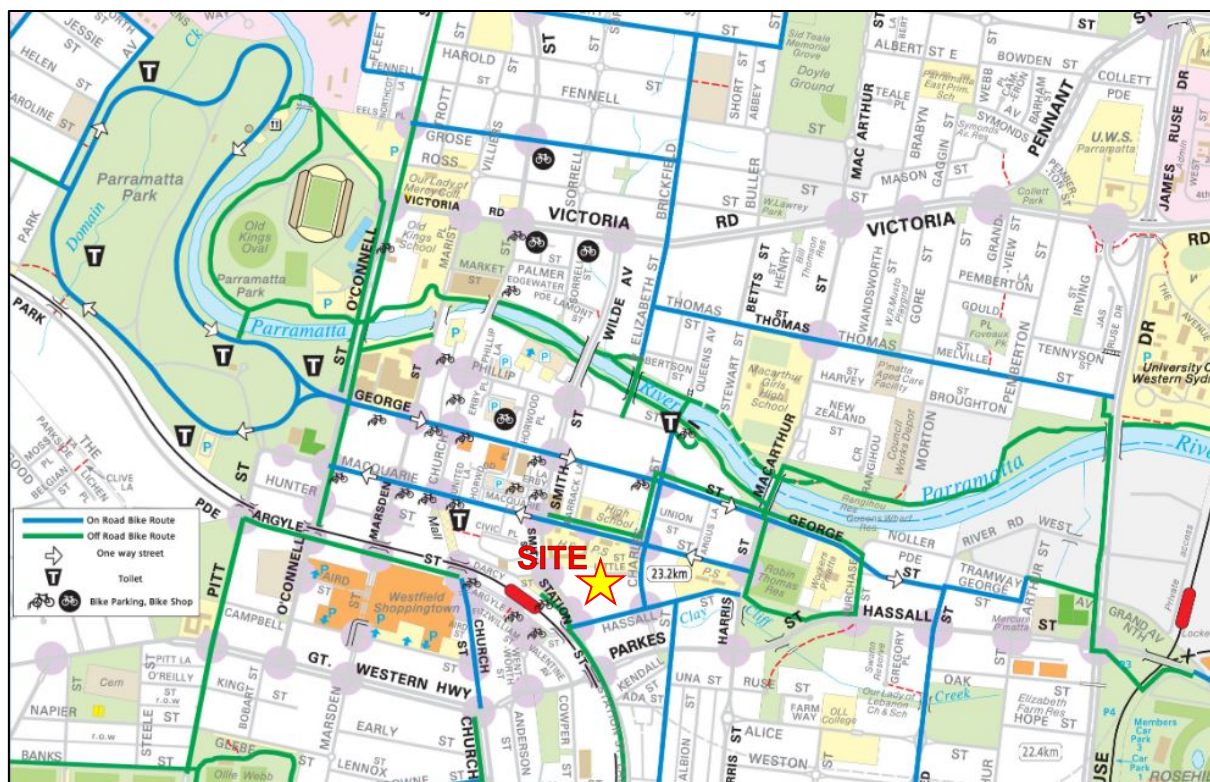


Figure 21: Parramatta CBD Cycling Routes

6.9 2016 Census – Journey to Work Data Analysis

The existing travel patterns of residents and workers within the surrounding locality was surveyed within the 2016 Census, with the Australian Bureau of Statistics making the Journey to Work (JTW) data available. A summary of key travel modes for workers within the Parramatta CBD have been reviewed, with the existing mode share presented in **Table 6**.

Table 6: Mode Share – Existing

Transport Mode	Existing
Train	46.9%
Bus	7.9%
Taxi	0.1%
Car Driver	23.4%
Car Passenger	2.2%
motorcycle	0.1%
Bicycle	0.3%
Walk	10.9%
Other	0.4%
Did not go / Work from Home / not stated	7.9%

7 Parking & Servicing Requirements

7.1 Council Car Parking Rates

7.1.1 Commercial GFA

In accordance with Council's LEP, Part 7.3 provides the following maximum car parking rate for commercial uses:

- 1 space per 100 m² GFA.

Application of this parking rate to the commercial yield of 12,981m² achievable through the proposed controls results in a maximum permissible parking provision of 130 car parking spaces. It should be noted that the parking requirement of 1 space per 100m² is reflective of the Sites proximity to public transport, given a standard parking rate for a commercial development in an unrestrained environment would be 1 space per 40m², based on the RMS Guide.

7.1.2 Tertiary Education GFA

Council's LEP does not provide a parking rate for Educational Establishments. Therefore, reference has been made to the City of Sydney (CoS) Local Environmental Plan (2012) given the comparable nature of the two areas.

The maximum number of car parking spaces to be provided for education uses, as stipulated in the CoS LEP, is 1 space for every 200m² of GFA. Applying this parking rate to an educational GFA of 15,337m² results in a maximum car parking requirement of 77 car parking spaces.

It is again noted that the parking rates contained in the CoS's LEP are maximum rates, which recognises the strong public and active transport connections within the CBDs. As discussed, restrictive parking policies aide in encouraging travel by sustainable modes of transport, which is a key objective for Local and State Government.

7.1.3 Parramatta CBD Strategic Transport Study

Technical Paper 3 - Parking Review (2017) (the Paper), which supported the Transport Study discussed in Section 4.9.1, reviewed the current parking demand and supply in Parramatta CBD and compared the parking policies to those established in North Sydney CBD and Sydney CBD. One of the key messages from the Paper was for Council to seek to review its parking policies to be more restrictive and in line with other CBDs in Sydney.

The Paper outlined the policy requirements for car parking in Sydney CBD, which states the following requirements for commercial developments with a FSR greater than 3.5:

- Commercial: $M = (G \times A) / (50 \times T)$
- *Where: M = maximum number of parking spaces; G = GFA of all office/business premises in the building (m²); A = Site Area (m²); T = Total GFA of all buildings on the site (m²).*

Application of the above rate to the indicative development yield would result in a maximum permissible provision of 23 car parking spaces. The Transport Study recommends that the above rate is suitable for Parramatta CBD and it is understood that this rate has been endorsed. The proposed parking provision would therefore comply with the recommendations of the Transport Study (and expected future Council planning controls), availing of the excellent public transport linkages in the area.

7.2 Car Parking Provisions

As noted, application of Council's LEP parking rates results in a maximum permissible 130 car parking spaces for the commercial use on the Site. In regards with the Transport Study, the commercial element of the Proposal could have a maximum permissible 23 parking spaces.

With reference to the CoS LEP, the educational element of the Proposal could have a maximum permissible 77 parking spaces. Therefore, the Proposal could provide a total maximum of 100 car parking spaces.

The Proposal responds by providing 14 parking spaces; all of these spaces would be allocated to staff located at the Site.

It is our opinion that this level of parking provision – which would in turn significantly reduce traffic generation and encourage the use of non-car travel – is entirely appropriate to a Site so well located in regard to public transport, walk and cycle infrastructure.

7.3 Accessible Parking

Council's DCP Part 4.3.3.5, Car Parking Rates, requires 1 - 2% readily accessible parking spaces. As such, 1-2% of the proposed parking spaces equates to less than 1 accessible space. Therefore, the single proposed accessible car space complies with Council's DCP.

7.4 Motorcycle Parking

Council's DCP (Part 4, Section C.6) requires motorcycle parking to be provided at one motorcycle space per 50 car parking spaces (or part thereof), and motorcycle parking space area is to be equal to one car parking space. Application of this rate to the proposed development results in a requirement of 1 motorcycle space.

The Proposal responds by providing 3 motorcycle spaces.

7.5 Bicycle Parking

Council's DCP Part 3.6.2 requires the following bicycle parking requirements for business and office premises:

- 1 bicycle space per 200m² of office and business premises.
- Adequate change and shower facilities for cyclists.

Application of Council's DCP bicycle rates to the Proposal's 12,981m² commercial GFA results in the requirement for 65 bicycle parking spaces.

The Proposal responds by providing 188 bicycle spaces, with 178 provided within the basement and 10 visitor spaces provided on the ground floor close to Hassall Street. To complement the bicycle parking, separate changing rooms (male and female) are provided on the ground floor, with 18 shower cubicles to be provided. The superior provision of cycle parking facilities would encourage the use of bicycle as a travel mode to the Site.

It is noted that Council's DCP does not provide a bicycle parking rate for Educational Establishments, however the proposed provision of 188 spaces would be sufficient to service the Proposal.

7.6 Servicing and Waste Collection

The loading bay requirement for the Proposal has been based on the now operational 1 Parramatta Square (1PSQ) development. 1PSQ is another of WSUs campuses (in conjunction with Charter Hall) in Parramatta CBD and provides a similar level of GFA to that of the Proposal (approximately 27,000m²). The operational requirements of the Proposal are therefore already well understood. The 1PSQ development provides 2 servicing bays and therefore 2 serving bays are also to be provided as part of the Proposal.

All servicing bays would be managed by a Loading Dock Management Plan (LDMP), which is expected to be produced in response to a suitable Condition of Consent. One of the measures which would be

considered for inclusion in the LDMP would be to limit servicing to outside of peak commuter periods, therefore minimising the interaction between peak pedestrian flows and servicing vehicles.

The loading bays (which would be serviced privately by a company nominated by Charter Hall), have been designed to accommodate up to 6.4m Small Rigid vehicles (SRV) trucks. SRV trucks have been nominated as a management solution, and endorsed for use by Charter Hall and WSU, as a vehicle which is suitable to service the Site, whilst also allowing the Proposal to be designed in accordance with the Design Excellence Principles it is trying to achieve for the ground floor plaza area.

The loading bay spaces would be provided with a clear width of 3.5m and a length of up to 6.4 metres, which meets the minimum requirements of AS 2890.2 for 6.4m SRVs. Further discussion on the design of the loading area is provided in **Section 12**.

8 Traffic Assessment

8.1 Traffic Generation

From the outset, it is important to note that the educational component of the Site is not expected to generate any significant number of vehicle trips, specifically given that no car parking would be provided for WSU students. The following assessment therefore focuses on the commercial component of the Site.

The traffic generation of the commercial GFA has been assessed with reference to the RMS Guide Update. The following vehicle-based generation rates are applicable for commercial development in Parramatta:

- 0.69 AM peak hour trips per 100 m² of commercial GFA;
- 0.61 PM peak hour trips per 100 m² of commercial GFA; and
- 6.06 daily trips per 100 m² of commercial GFA.

Application of these trip rates to the commercial yield of 12,981m² GFA results in a forecast peak hour traffic generation of:

- 90 morning peak hour trips;
- 79 evening peak hour trips; and
- 787 daily trips.

This traffic volume represents the maximum traffic generating potential of the commercial use based on the yield and assuming adoption of current LEP parking controls. **However, this does not account for the trips being restrained by the number of parking spaces on-site which is consistent with the Transport Study recommendations.** Based on the RMS Guide the following parking space trip rates are applicable for Parramatta commercial developments:

- 0.73 AM peak trips per parking;
- 0.66 PM peak trips per parking space; and
- 6.5 daily trips per parking space.

When applying the above trip rates to the proposed parking provision of 14 spaces, it would result in:

- 10 morning peak hour trips and;
- 9 evening peak hour trips; and
- 91 daily trips.

This represents an additional 1 vehicle every 6 - 7 minutes during the peak periods and could in no way be considered a significant volume of traffic, a result of the specific constrained parking proposal.

The CBD Transport Study recommends restrictive parking policies consistent with Sydney CBD, and the endorsement of this rate demonstrates that the traffic impact would be minimal.

8.2 Trip Distribution

Noting that Hassall Street is a one-way road in a westbound direction past the Site, all vehicles will have to enter via the Charles Street / Hassall Street intersection to access the Site. Subsequently, all exiting vehicles will need to leave via the Hassall Street / Argyle Street / Station Street intersection.

All vehicles entering Hassall Street / Charles Street intersection have been distributed accordingly to the existing traffic flow splits entering Hassall Street.

This trip distribution has been used for the following SIDRA analysis.

8.3 Cumulative Traffic Generation

A cumulative assessment of nearby known developments/proposals have been taken into consideration as part of the SIDRA analysis. The developments that have been identified in the surrounding area are provided by **Table 7**.

Table 7: Identified Developments in Vicinity of Site

Site	Proposal	Car Parking Spaces
9 Hassall Street	DA – mixed use residential / commercial	221
11 Hassall Street DA/67/2015	DA – residential	198
12 Hassall Street PP_2017_COPAR_006_00	Planning Proposal – mixed use	Maximum parking rates with regards to parking rates in the CBD planning proposal – current reference scheme requires 220 spaces
23-29 Hassall Street DA/241/2013	DA - mixed use	155
80-100 & 175 Macquarie Street SSD 7237	SSDA – schools	38
7 Charles Street DA/560/2017	DA – mixed use (currently proposal)	237
12 Parkes Street DA/1263/2016	DA – mixed use (currently proposal)	79
20 Parkes Street PP_2016_PARRA_007_01	Planning Proposal	168

The developments along Macquarie Street, Charles Street and Parkes Street would not result in significant volumes of traffic travelling through the key intersections of Station Street/Hassall Street/Argyle Street and Hassall Street/Charles Street and therefore have not been included in the SIDRA analysis.

Similarly, the development of 23-29 Hassall Street would result in little traffic travelling through these intersections, with the most direct routes to the external road network being via Harris Street (to the east) or Parkes Street (by way of Wigram Street). Further, the Traffic Impact Assessment produced by Varga Traffic Planning in support of the development forecast that the proposal would only increase traffic generation associated with the site by 28 vehicles per hour. It was concluded that this level of traffic generation would not have material impact on the operation of the road network. This development has also therefore not been included in the SIDRA analysis.

The traffic forecast by the supporting documentation for the DAs at 9 and 11 Hassall Street was as follows:

- 9 Hassall Street: 42 peak hour vehicle trips.
- 11 Hassall Street: 65 peak hour vehicle trips.

The Planning Proposal at 12 Hassall Street included the implementation of maximum parking rates. Based on the reference scheme assessed, the development could provide a maximum of 220 parking

spaces (215 residential spaces and 5 commercial spaces). Based on RMS guidance for trips per parking space the development could therefore generate the following trips:

- Residential: 32 vehicles in the AM peak hour and 23 in the PM peak hour.
- Commercial: 4 vehicles in the AM peak hour and 29 in the PM peak hour.

Therefore, the total trips associated with these “other” developments in the vicinity of the Site are as follows:

- 143 veh/hr in the morning peak.
- 139 veh/hr in the evening peak.

The trip distribution of these trips are detailed in the following **Figure 22** and **Figure 23**.

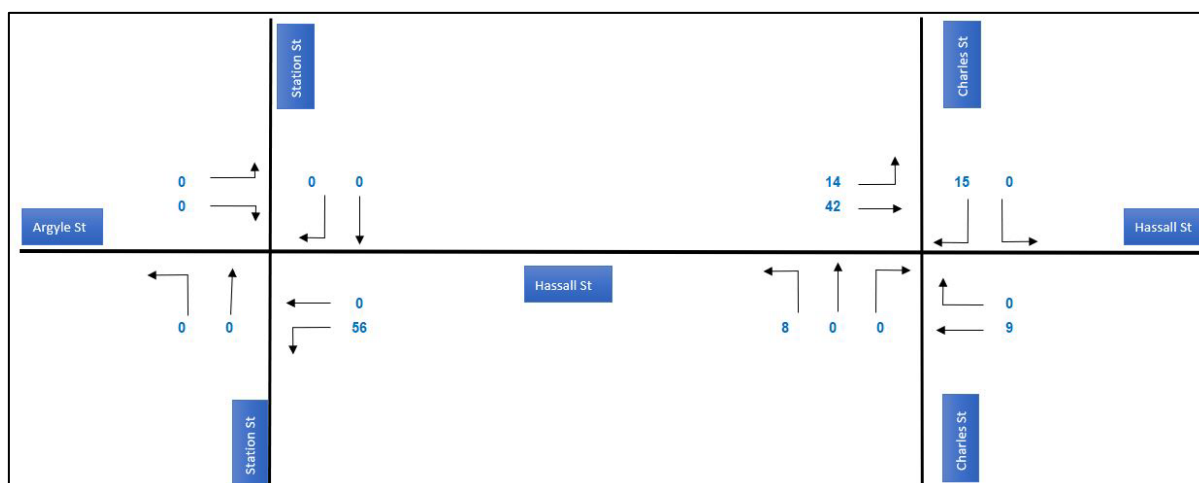


Figure 22: Nearby Development AM Traffic Generation

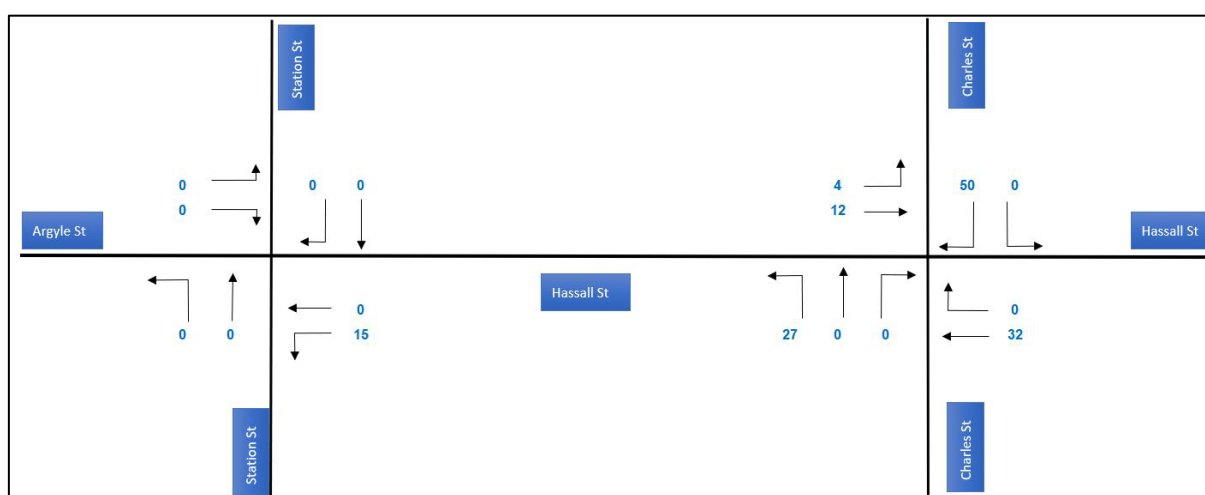


Figure 23: Nearby Development PM Traffic Generation

8.4 Traffic Impacts

Combining the proposed development's traffic generation, the nearby developments' traffic generation and the existing intersection survey traffic counts, the following figures detail the cumulative traffic flows at each key intersections.

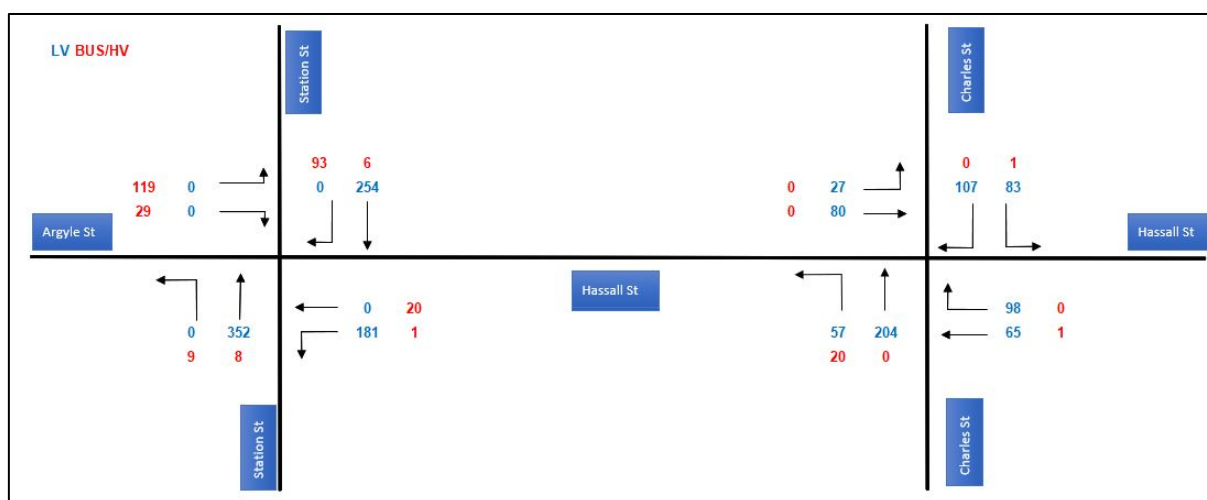


Figure 24: Cumulative AM Traffic Flows

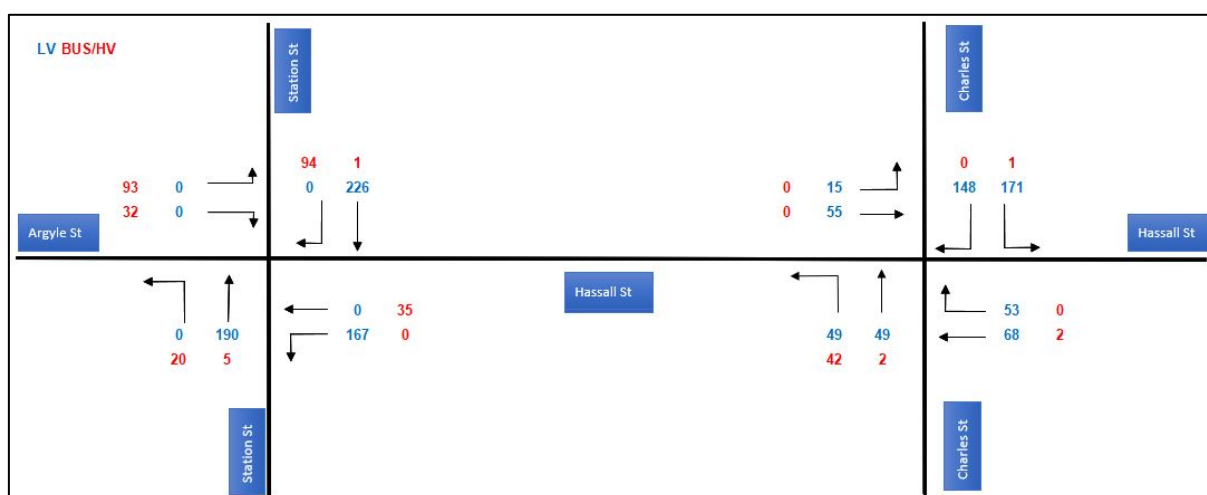


Figure 25: Cumulative PM Traffic Flows

The impact of these trips, alongside the traffic generation forecast for the Proposal, have been assessed using SIDRA 8, with the results summarised in **Table 8**.

Table 8: Intersection Performance, Existing and plus Development Scenarios

Intersection	Scenario	Period	AVD	LOS
Station Street / Hassall Street / Argyle Street	Existing	AM	26.0	B
		PM	27.4	B
	Existing + Development + Other Proposals	AM	26.8	B
		PM	27.7	B
Hassall Street / Charles Street	Existing	AM	31.1	C
		PM	28.1	B
	Existing + Development + Other Proposals	AM	31.9	C
		PM	28.2	B

As can be seen from the above, the intersections are expected to continue to operate well, with a LOS B and / or C in both the morning and afternoon peaks, and satisfactory delays in the morning and afternoon peaks. Furthermore, the SIDRA analysis indicates that the 'net' traffic volumes arising from the relevant developments in the area are of a sufficiently low order, that the impacts of these volumes would not result in material increases in AVD or LOS once distributed across the network.

9 Pedestrian Impacts

9.1 Background

JJ Fruin developed a set of planning principles to assess pedestrian crowding, documented in his book 'Pedestrian Planning and Design' (1987). These principles have since been adopted as the global industry standard approach to planning for pedestrians, with the methodology used to interpret the performance of space and how people move and interact under certain conditions. Like traffic, the results are categorised into Levels of Service (LOS).

The purpose of the analysis below is to identify potential pinch-points for the future pedestrian route to the Site based on the predicted level of pedestrian demand, with a particular focus on circulation areas including queuing areas at the intersection of Station Street and Hassall Street.

When used as an output metric, the Level of Service demonstrates the relationship density and flow rates; a LOS A indicates a high speed, free-flowing environment with a low flow rate, whereas a LOS E or F demonstrates a high density, low-speed environment with a high flow rate. The desired LOS depends on the context of the environment.

The Fruin Levels of Service are displayed in following figures to indicate what each LOS would represent for each criterion. The accompanying diagram represents a view of the density based on 3 metres by 2 metres area (delineated by the grey shaded section).

FRUIN Level of Service Parameters - Walkways

LEVEL OF SERVICE	DENSITY (ped / m ²)		SPACE (m ² / ped)		FRUIN SPACE (ft ² / ped)		FLOW RATE (ped / m / min)		FRUIN FLOW RATE (ped / ft / min)	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A		0.31	3.25		35			23.0		7
B	0.31	0.43	2.32	3.25	25	35	23.0	32.8	7	10
C	0.43	0.72	1.39	2.32	15	25	32.8	49.2	10	15
D	0.72	1.08	0.93	1.39	10	15	49.2	65.6	15	20
E	1.08	2.15	0.46	0.93	5	10	65.6	82.0	20	25
F	2.15			0.46		5	82.0		25	

FRUIN Level of Service Parameters - Stairs

LEVEL OF SERVICE	DENSITY (ped / m ²)		SPACE (m ² / ped)		FRUIN SPACE (ft ² / ped)		FLOW RATE (ped / m / min)		FRUIN FLOW RATE (ped / ft / min)	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A		0.54	1.86		20			16.4		5
B	0.54	0.72	1.39	1.86	15	20	16.4	23.0	5	7
C	0.72	1.08	0.93	1.39	10	15	23.0	32.8	7	10
D	1.08	1.54	0.65	0.93	7	10	32.8	42.7	10	13
E	1.54	2.69	0.37	0.65	4	7	42.7	55.8	13	17
F	2.69			0.37		4	55.8		17	

FRUIN Level of Service Parameters - Queues

LEVEL OF SERVICE	DENSITY (ped / m ²)		SPACE (m ² / ped)		FRUIN SPACE (ft ² / ped)		FRUIN INTER-PERSON SPACING		
	Min	Max	Min	Max	Min	Max	Min	Max	
A		0.83	1.21		13		4		
B	0.83	1.08	0.93	1.21	10	13	3.5	4	Circulation zone
C	1.08	1.54	0.65	0.93	7	10	3	3.5	Comfort zone
D	1.54	3.59	0.28	0.65	3	7	2	3	No touch zone
E	3.59	5.38	0.19	0.28	2	3		2	Touch zone
F	5.38			0.19		2			

Figure 26: FRUIN Level of Service Parameters

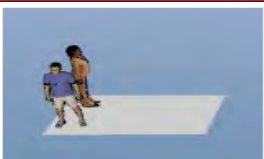





Fruin LoS	Description of LoS for Queuing	
A	Space is provided for standing and free circulation through the queuing area without disturbing others.	
B	Space is provided for standing and restricted circulation through the queue without disturbing others.	
C	Space is provided for standing and restricted circulation through the queuing area by disturbing others. It is within the range of the personal comfort body buffer zone established by psychological experiments.	
D	Space is provided for standing without personal contact with others, but circulation through the queuing area is severely restricted, and forward movement is only possible as a group.	
E	Space is provided for standing but personal contact with others is unavoidable. Circulation within the queuing area is not possible. This level of area occupancy can only be sustained for short periods of time without physical and psychological discomfort.	
F	Space is approximately equivalent to the area of the human body. Standing is possible, but close unavoidable contact with surrounding standees causes physical and psychological discomfort. No movement is possible, and in large crowds the potential for panic exists.	

Figure 27: FRUIN Level of Service for Queuing

9.2 Pedestrian Movement Generation

9.2.1 Commercial Use

The pedestrian trip generation of the commercial element of the Proposal has been assessed having regard for the RMS Guide Update. The following person-based generation rates were adopted:

- 1.43 AM peak hour trips per 100m² of commercial GFA;
- 1.29 PM peak hour trips per 100m² of commercial GFA; and
- 18.94 daily trips per 100m² of commercial GFA.

Application of these trip rates to the described commercial use yield of 12,981m² results in the following forecast peak hour and daily generation:

- 186 morning peak hour person-based trips ;
- 168 evening peak hour person-based trips; and
- 2,459 daily person-based trips

9.2.2 Educational Use

Once the development is well established (i.e. after 4 years of operation), it is expected that the student population of the WSU Innovation Hub would be 1,610 students and the staff population would be 426 staff members. Based on operational data of the nearby 1PSQ, it is understood that the maximum number of these staff and students on-site at any one time would be 75% of the population (or 1,208 students and 320 staff).

The University class times commence from 09.00AM and 09.30AM and continue throughout the day until 10.00PM. However, it is expected that the maximum number of staff and students (320 staff and 1,208 students) expected on the Site at any one time would all arrive by 11.00am. It is noted that the departure profile is expected to be spread across a longer period throughout the afternoon and evening. Therefore the peak number of person-based trips associated with the educational use would be during the morning peak.

In order to determine an arrival and departure profile for these staff and student, known travel survey data has been referred to for a Sydney area metropolitan university campus, and applied to the expected population of the WSU Innovation Hub. The resulting trips are summarised by **Table 9** and **Table 10**.

Table 9: Expected Peak Travel Times – Students

Peak Arrival & Departure Periods	%	Trips
<i>Morning Arrival</i>		
07.00-08.00AM	8%	129
08.00-09.00AM	35%	564
09.00-10.00AM	20%	322
10.00-11.00AM	12%	193
<i>Afternoon Departure</i>		
04.00-05.00PM	20%	242
05.00-06.00PM	25%	302
06.00-07.00PM	17%	205

Table 10: Expected Peak Travel Times – Staff

Peak Arrival & Departure Periods	%	Trips
<i>Morning Arrival</i>		
07.00-08.00AM	12%	51
08.00-09.00AM	35%	149
09.00-10.00AM	20%	85
10.00-11.00AM	8%	34
<i>Afternoon Departure</i>		
04.00-05.00PM	20%	64
05.00-06.00PM	30%	96
06.00-07.00PM	17%	54

As shown by the above, the educational element of the Proposal is forecast to generate the following person-based peak hour trips:

- 713 morning peak hour person-based trips (08.00-09.00AM); and
- 398 evening peak hour person-based trips (05.00-06.00PM).

9.2.3 Total Person-Based Trips

Based on the above, the Proposal is therefore expected to generate the following person-based trips:

- 899 morning peak hour person-based trips; and
- 566 evening peak hour person-based trips.

9.3 Pedestrian Movements – Impacts

Given the high number of pedestrians known to already walk past the Site, alongside most of the end users of the Proposal ending their trips on foot due to the constrained parking provision, the impact of the additional density at the Site on existing footpath capacity has been assessed. This has given particular regard to the levels of crowding at the signalised intersection at Hassall Street/Station Street East (leading from/to the Station and bus interchange). As per the survey data, 730 pedestrians are currently travelling from the direction of the Station, past the Site in the morning peak and 377 are travelling to it in the evening peak (61% from and 39% to).

A 70:30 split has been adopted for person trips generated by the Proposal, which reflects the current trends for pedestrians travelling along Hassall Street, but also recognises that a higher proportion of pedestrians travelling to the Site would travel from the Parramatta Public Transport Interchange. The resulting number of pedestrians travelling to/from the Site could be up to:

- 610 traveling from the Station and 261 travelling from the east to the Site in the morning peak; and
- 377 travelling to the Station and 161 heading an eastbound direction from the Site in the evening peak.

It is noted that the above represents the most conservative scenario and assumes that all trips would be towards the Site in the morning peak, with no consideration given to departure trips. Similarly, the afternoon peak hour trips have all been assumed to be departure trips with no consideration given to arrival trips. This is to ensure that, given the number of person-based trips expected to be generated by the Proposal, a robust assessment is conducted

The most conservative scenario to assess is the morning peak, which would have 1,340 pedestrians (existing plus development pedestrians) travelling from the Station in the direction of the Site. On-site observations found that the average cycle time to be 78 seconds. On this basis, the maximum pedestrian crossing opportunities at this intersection would occur 46 times per hour. This equates to 29 pedestrians per cycle.

Application of the pedestrian flow rate and queue storage area at the crossing as per the JJ Fruin Principles represents $0.82\text{m}^2/\text{ped}$ and LOS C for the pedestrian area on the western side of the intersection. The JJ Fruin LOS B ranges from 0.65 to $0.93\text{m}^2/\text{ped}$ and defines the performance criteria as:

“Space is provided for standing and restricted circulation through the queuing area by disturbing others. It is within the range of personal comfort body buffer zone established by psychological experiments”

Therefore, the Proposal would not create unacceptable levels of overcrowding at the intersection. It is also worthy of note that, as part of the recently completed works to make Hassall Street one-way, the footpath was widened on the northern side of Hassall Street from the intersection to the western side of the Site and thus, more waiting area has been provided at the intersection and the pedestrian amenity along Hassall Street has been the further enhanced to facilitate high pedestrian flow.

9.4 Access Point Design: Pedestrians

The proposed Site access and car park have been reviewed with regard for AS2890.1 to ensure a compliant design which incorporates pedestrian and vehicular safety requirements (refer also to **Section 12** below).

To the east of the Site, there is an extensively wide vehicular access (approximately 13m) which services the NSW Police Headquarters. The existing eastern Site vehicular access has historically been located

adjacent to the Police Headquarters access, cumulating in some 16m where pedestrians have to cross over access driveways.

As a result, the Proposal responds to the existing conditions by consolidating the existing 3 vehicular accesses into a single driveway. This access is also provided 16m west along Hassall Street, away from the NSW Police Headquarters driveway, and thus provides improved amenity for pedestrians.

Further, the Proposal includes new ground level setback from Hassall Street of at least 2.6m, which will improve pedestrian amenity for those travelling to and from the development as well as pedestrians travelling along Hassall Street.

10 Public & Active Transport Impacts and Opportunities

10.1 Introduction

It is expected that the majority of the development's commuters would use public transport modes each day for the trip to/from Site. The following section provides an assessment of the likely impact of the Proposal on the surrounding public transport network. The initiatives and strategies discussed as part of the proposed Framework Travel Plan (Section 10.6) to maximise public and active transport use would be further developed as part of the relevant Construction and Occupation Certificate works.

10.1.1 Commercial Land Use Trips

Most commuters to and from the WSU Innovation Hub would take advantage of the excellent public transport in close proximity of the Site. Section 6.9 discussed the current modal splits based on the JTW data recorded by the 2016 Census. **Table 11** summarises the total trips forecast to be generated by each mode of transport based on existing travel trends for the commercial element of the scheme. Given the restrained parking provision, it is already known that the maximum number of people travelling to the Site by car would be 14, therefore a total of 28 trips to/from the Site would be undertaken by car.

It is noted that the "Did not go / Work from Home / not stated" category has been distributed across the public and active transport modes.

Table 11: Total Commercial Trips

Transport Mode	Modal Share %	Commercial Trips
Train	67.1%	1,650
Bus	11.4%	281
Taxi	0.1%	2
Car Driver	1.1%	28
Car Passenger	2.2%	54
motorcycle	0.1%	2
Bicycle	2.3%	57
Walk	15.2%	375
Other	0.4%	10
Total	100%	2,459

Table 17 summarises the peak hour person-based trip generation for each mode.

Table 12: Peak Hour Commercial Trips

Transport Mode	Modal Share %	AM	PM
Train	67.1%	125	113
Bus	11.4%	21	19
Taxi	0.1%	0	0
Car Driver	1.1%	2	2
Car Passenger	2.2%	4	4
motorcycle	0.1%	0	0
Bicycle	2.3%	4	4
Walk	15.2%	28	26
Other	0.4%	1	1
Total	100%	186	168

10.1.2 Educational Land Use Trips

Adopting the same approach to that for the commuter trips whilst also reflecting the expected travel trends associated with universities, **Table 13** summarises the total trips forecast to be generated by each mode of transport for staff and students. It is noted that there would be no parking on-site for students, however it is still expected that there would be a small proportion of car trips undertaken to public car parking in the Parramatta CBD by those who need to attend for a short period (i.e. one, 1-hour lecture), which is reflected in the below.

Table 13: Total Student and Staff Trips

Transport Mode	Modal Share %	Student Trips	Staff Trips
Train	67.7%	818	217
Bus	12.4%	150	40
Taxi	0.1%	1	0
Car Driver	1.0%	12	3
Car Passenger	2.2%	27	7
motorcycle	0.1%	1	0
Bicycle	0.3%	4	1
Walk	15.7%	190	50
Other	0.4%	5	1
Total	100%	1,208	320

Table 17 summarises the respective peak hour person-based trip generation for each mode for students and **Table 14** summarises the trips for staff.

Table 14: Peak Hour Student Trips

Transport Mode	Existing %	AM	PM
Train	67.7%	382	205
Bus	12.4%	70	37
Taxi	0.1%	1	0
Car Driver	1.0%	6	3
Car Passenger	2.2%	12	7
motorcycle	0.1%	1	0
Bicycle	0.3%	2	1
Walk	15.7%	89	48
Other	0.4%	2	1
Total	100%	564	302

Table 15: Peak Hour Staff Trips

Transport Mode	Existing %	AM	PM
Train	67.7%	101	65
Bus	12.4%	18	12
Taxi	0.1%	0	0
Car Driver	1.0%	1	1
Car Passenger	2.2%	3	2
motorcycle	0.1%	0	0
Bicycle	0.3%	0	0
Walk	15.7%	23	15
Other	0.4%	1	0
Total	100%	149	96

10.2 Total Peak Hour Trips by Mode

Table 16 summarises the total person-based trips expected to be generated by the Proposal.

Table 16: Proposal Total Person-Based Peak Hour Trips

Transport Mode	AM	PM
Train	609	383
Bus	110	69
Taxi	1	1
Car Driver	8	5
Car Passenger	20	12
motorcycle	1	1
Bicycle	6	5
Walk	141	88
Other	1	2
Total	899	566

As can be seen, the peak trips expected to be generated by the Proposal are by train, with 609 train trips expected during the AM peak hour and 383 train trips expected during the PM peak hour.

10.3 Public Transport Impacts: Train

Parramatta Train Station is currently serviced by at least 3 metropolitan train line services, each with at least 4 services in both directions during the extended AM and PM peak periods which is further supplemented with the express train services available that head to major town centres. This is a total of at least 12 metropolitan train line services excluding the express train services.

The increase of 609 AM and 383 PM Peak train commuters represents an additional 51 and 32 person trips for each of the 12 metropolitan services during the AM and PM peak periods respectively. Given the frequency of services through Parramatta Station, it is expected that the existing services be able to accommodate the demand for the projected train usage during the peak periods.

Opal Card Data obtained from the TfNSW Open Hub Portal showed that for the week of 25 July 2016 – 29 July 2016, during the morning peak hour, an average of 12,489 passengers tapped-on and tapped-off. Noting that patronage would have increased since this time, the forecast trips associated with the Proposal represent a small proportion of trips associated with the Station (5% based on 2016 data).

Further, the average daily patronage for Parramatta Station recorded in 2018 was 92,950 passengers. Therefore, it is clear that the train trips forecast to be generated by the Proposal represent a small

proportion of the overall patronage of which the station accommodates and would not materially impact the operation of the train services at the station.

Finally, and of particular importance that should also be considered, is the delivery of the Parramatta Light Rail in 2023 and the proposed Sydney Metro West which provide further benefit and access to public transport.

10.4 Public Transport Impacts: Bus

With an expected 110 AM bus trips and 69 PM bus trips spread over the high number of bus services (up to 36 services) available in Parramatta, it is likely that there is sufficient spare capacity to accommodate these additional bus trips, which equate to 3 additional passenger per bus service. Each peak hour bus service would be expected to run at least every 10 minutes – 30 minutes. Therefore, the additional peak hour bus commuters would be spread over these multiple bus services.

10.5 Bicycle Trip Assessment

As discussed in Section 7, a total of 188 cycle parking spaces are to be provided for the Proposal which would more than accommodate the required cycle parking demand.

The proposed Travel Plan Framework discussed in Section 10.6 will aim to encourage the increase of active transport commuters through the provision of accessible cycling facilities and incentives. It is noteworthy that a dedicated cycleway is provided directly at the street frontage which will provide ease of access for cyclist. As discussed in **Section 6.8**, the Parramatta CBD's cycling network is extensive and would provide the necessary infrastructure to facilitate future cycling trips from the Proposal.

10.6 Travel Plan Framework

10.6.1 Introduction

It is proposed to prepare a Framework Travel Plan (FTP) to inform the future Green Travel Plan for the development in response to a suitable condition of consent. The primary objectives of the Plan will be to:

- Reduce the environmental footprint of the development
- Promote the use of 'active transport' modes such walking and cycling, particularly for short-medium distance journeys
- Reduce reliance on the use of private vehicles for all journeys
- Encourage a healthier, happier and more active social culture

Having regard for the above, this Plan would seek to adopt the following movement hierarchy with priority given to 'active transport'.

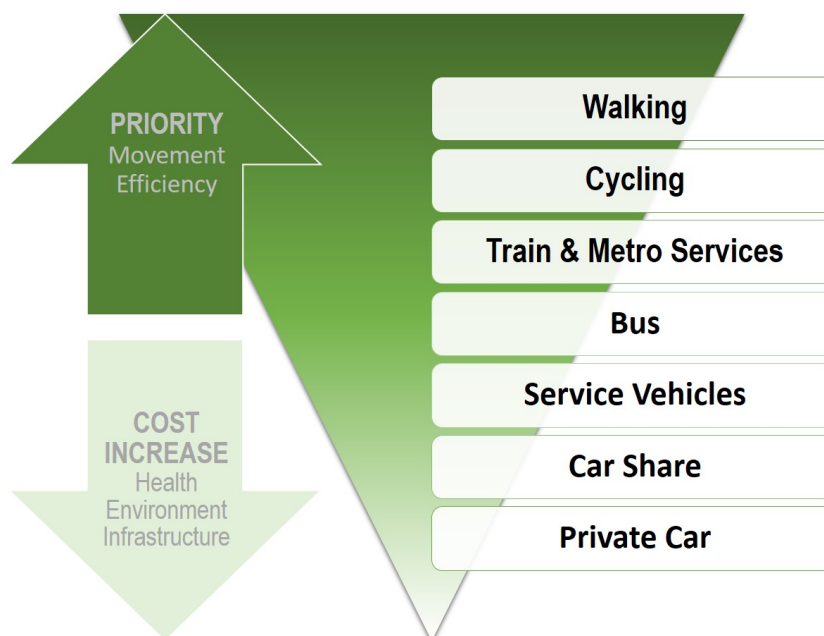


Figure 28: Movement Hierarchy

10.6.2 Site Audit & Targets

An audit of the Site and proposed development has been conducted for this SSDA to determine existing facilities in the area. This would be revised and conducted in further detail as part of the GTP to consider the following:

- Public transport services in the area, including proximity to the site, frequency of services and accessibility;
- Location of nearby car share pods;
- Existing bike and pedestrian facilities, including accessibility, connectivity and safety;
- Existing mode-split data for the Site and local area.

It is noted that due to the reduced parking provision, travellers to the Site would have to travel by non-car modes. However the GTP would ensure that public and active transport is maximised and would also provide useful insight into people's travel behaviour through regular monitoring conducted through surveys.

The ultimate vision for the Site is to encourage users to travel by all forms of sustainable transport. This includes the approach of restraining on-site car parking and promoting the use of alternatives, which

would be reflected by the proposed targets. Parking in the area is constrained where it is short term and restricted to paid parking schemes in the nearby vicinity of the Site. As there are no real viable long-term parking options available, this approach is unlikely to effect on-street parking surrounding the Site.

The GTP would provide a package of Site specific measures to promote and maximise the use of all sustainable travel modes, including walking, cycling, public transport and car sharing. As discussed, it will include a review of existing transport choices. From this the GTP would set targets so that the effective implementation of the Plan can be assessed. The GTP shall be reviewed regularly to ensure it remains relevant and reflective of current conditions.

10.6.3 Action Strategies

Three main strategies have been identified and the actions required for each are detailed in **Table 17** below. The table details how the targets the specific actions to be implemented as part of this FTP, the timeframe for implementation and who will be responsible for implementing each action. In developing this FTP and the strategies and actions comprising it, it is recognised that the end user is known, and it is vital that WSU facilitates the important process of monitoring and review.

Table 17: Framework Travel Plan Action Table

STRATEGY	HOW IT WORKS	IMPLEMENTATION
1 Managing Car Use		
1.1 Car Sharing	Staff and visitors are encouraged to use a shared car (egg. GoGet) to reduce the need for individuals to drive.	Utilise car share and actively promote on site to staff and visitors
1.2 Carpooling	Establish a car pooling program to help people find someone to share in their daily commute.	Prepare information sheets specific to people on site.
2 Promoting Public Transport		
2.1 Provision of Opal Cards with Credit for a period of free rides	WSU may consider subsidising Opal Cards to increase public transport use.	Subject to WSU choice.
2.2 Public transport for Business travel	WSU can promote public transport as the first preference for official University travel.	Promote public transport through employee website.
3 Promoting Cycling and Walking		
3.1 Providing End of Journey Facilities	Providing facilities such as showers, change rooms, lockers.	188 bicycle parking spaces will be provided alongside a number of showers and changing facilities.
4 Other		
4.1 Distribution information Fact Sheet	Provides more information about the sustainable travel options.	Prepare information sheets specific to students, staff and families.

11 Preliminary Construction Traffic Management Plan

Ason Group has previously been commissioned to produce a Construction Traffic and Pedestrian Management Plan (CTPMP) for demolition works and excavation works and therefore already have a strong understanding of the Site's constraints, requirements and considerations. The approved construction management principles for the demolition activities currently being undertaken on-site are provided within the Demolition CTPMP provided as **Appendix A**, which not only provides the principles for managing construction traffic, but also an understanding of the likely traffic impacts during the construction period.

The staging of works for the construction of the Proposal is currently unknown, and therefore a detailed CPTMP would need to be developed further, in consultation with Council and the Sydney Coordination Office (SCO), at the relevant stage. The Demolition CTPMP provided as Appendix A would be further built upon to consider the more extensive construction phase, (including concrete pours). This would be provided to Council as part of the construction management plan submitted under the conditions of any approval.

12 Design Commentary

12.1 Relevant Design Standards

The Site accesses, car park and loading area have been designed with regard for the relevant requirements of Councils DCP and the relevant Australian Standards (AS2890.1, AS2890.2 and AS2890.6). The design of the basement has been assessed through swept path analysis, which is provided as **Appendix A**.

The following characteristics are noteworthy with regard to the design of the site access and car parking.

12.2 Car Park

In accordance with AS2890.1, the vehicle access has been designed to the following requirements:

- Category 1 (combined 6m exit / entry vehicle crossing width) for a development providing 14 parking spaces.
- The main car park aisle has been designed with a minimum clear width of 6.2m.
- All parking spaces are designed in accordance with a User Class 1A and are provided with a minimum space length of 5.4m, a minimum width of 2.4m.
- Dead-end aisles are provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS2890.1.
- The required 2m x2.5m pedestrian visibility splay is ensured at the point a vehicle emerges from the basement, by provision of bollards around the column located adjacent to the access driveway.
- The disabled parking space is to be provided in accordance with AS2890.6, which requires a space with a clear width of 2.4m and located adjacent to a minimum shared area of 2.4m.

12.3 Service Vehicle Access

The commercial (heavy) vehicle facilities of the development have been designed having regard for the operational requirements of WSU and the requirements of AS2890.2. In this regard the following is considered noteworthy:

- The internal design of the service area has been undertaken in accordance with the requirements of AS2890.2 for the maximum length vehicle accessing the site being a Small Rigid Vehicle of 6.4m in length.
- All service vehicles can enter and exit the Site in a forward direction.

- A minimum bay width of 3.5m x 6.4m is provided.
- A minimum clear head height of 3.5m is provided within all areas traversed by service vehicles.
- A maximum ramp grade of 1:6.5 has been provided. It is noted that the required grade transitions have not been provided in full compliance with AS2890.2. However, as per AS2890.2, the ground clearance has been checked for a 6.4m SRV and it has been illustrated that an SRV can successfully achieve access to the basement.

12.4 Design Summary

The internal configuration of the Site has been designed to achieve compliance with the relevant standards as far as practicable, noting that the Site is relatively constrained from a size and heritage perspectives alongside the objective of achieving Design Excellence Principles (please refer to relevant EIS supporting documentation). Therefore 6.4m SRV trucks have been nominated as the servicing vehicle to allow the Proposal to be designed with regard for these considerations, whilst achieving a level of servicing which meets the needs of WSU. Given the low traffic volumes associated with the Proposal, the design of the basement is considered to be an efficient use of the space, whilst ensuring safety for its users, and is therefore acceptable.

13 Conclusions

The key findings of this Transport Assessment (TA) are:

- The State Significant Development Application (SSDA) to a mixed-use tertiary educational and commercial development at 2b-6 Hassall Street, Parramatta, also known as the Western Sydney University (WSU) Innovation Hub.
- The Proposal seeks to expand WSU's Parramatta CBD campus network to include a state-of the-art facility for engineering innovation and will offer programs across engineering, architecture and entrepreneurship. WSU is reshaping its campus network, to combine existing campuses with CBD vertical campuses and is committed to developing a campus precinct that connects with and embed business, industry and community partners.
- The Proposal specifically relates to the provision of a 19 storey building, to provide 30,440m² of Gross Floor Area (GFA) including 15,337m² of tertiary educational GFA and 12,981m² GFA.
- The Site is located within the City of Parramatta LGA. It is well serviced by local public and active transport infrastructure and located 250 metres from the Parramatta Public Transport Interchange. The Site will be located within a 400m radius of 2 Parramatta Light Rail stops once it is complete and will also benefit from the Sydney Metro West project.
- The Proposal requires a maximum of 100 car parking spaces, with 23 for the commercial element (based on the findings of *Technical Paper 3 - Parking Review* (2017) (prepared by Aecom) which supported the Parramatta CBD Strategic Transport Study) and 77 for the educational use (based on City of Sydney LEP rates).

In response, the Proposal includes 14 car parking spaces to be provided for commercial element of the Proposal.

- Keeping car parking to a minimum will turn reduce car use and encourage travel by non-car modes. Noting the Site's proximity to public transport, it is therefore ideally located for implementation of this approach. This provides the opportunity for the Site to align with Local and State Government policy to support more environmentally sustainable travel. The overall aim of which is to reduce congestion and thus reduce emissions, improve air quality and provide better environments for communities.
- It is notable that the Site provides for 188 cycle parking spaces alongside a number of changing and showering facilities, which will maximise travel by cycle to the Site.
- The servicing requirements have been based on the nearby 1PSQ development, another of WSU's Parramatta CBD campuses. On this basis, 2 servicing bays have been provided, designed to accommodate up to 6.4m SRV trucks.

- SIDRA intersection analysis indicates the key intersections in the vicinity of the Site (Station Street / Hassall Street and Hassall Street / Charles Street) currently operate with acceptable delays and spare capacity.
- Based on 14 car parking spaces and trip per parking space assessment, the Proposal is expected to generate 10 veh/hr in the AM peak period and 9 veh/hr in the PM peak period.
- This level of traffic generation is not expected to materially impact the operation of the road network, even when considered against the relevant developments which are also being undertaken in the area.
- The subsequent SIDRA analysis undertaken to assess the impacts of the cumulative 'net' increase in traffic volumes indicates that there would be nominal increases in Degree of Saturation and Average Vehicle Delay and – importantly – Level of Service would remain unchanged.
- The Proposal is expected to generate some 899 person-based trips in the morning peak period and 566 person-based trips in the evening peak period.

The design of the Proposal has responded to this by providing an increased building set-back (being a minimum of 2.6m from Hassall Street). Further, 1 consolidated vehicular Site access point has been provided to minimise crossing points for pedestrians. This access has been provided some 16m to the west of the existing Police Headquarters, which in itself is some 13m wide. This therefore improves upon the existing pedestrian amenity at this location, which currently involves some 16m of driveway in which pedestrians have to cross (consisting of a 13m wide Police Headquarters driveway and 3m wide existing Site access located side by side).

- The Site is strategically well located within the Paramatta CBD, within close vicinity to public transport and pedestrian and cycle networks. The Proposal therefore can help to achieve key Local and State Government strategic objectives to reduce private vehicle use and create a series of 30-minute cities across Greater Sydney.
- The access and basement design have been designed having regard for relevant Australian Standards (AS2890 series) and ensures the safe and efficient access for vehicles and pedestrians to and from the Site.

In summary, the Proposal is supportable on traffic planning grounds and will not result in any adverse impacts on the surrounding road network or the availability of on-street parking.

Further, the location of the Site means that is ideally placed to encourage travel by sustainable transport and align with key strategic objectives to create a 30-minute city for the residents of Greater Sydney. Following the completion of PLR Stage 1 and other planned public transport improvements, the Site's connectivity would be further enhanced. The Proposal therefore represents the opportunity to create a development which aligns with strategic objectives but is also acceptable from a traffic and transport perspective.

Appendix A

Demolition Works Construction Traffic and Pedestrian Management Plan

21 February 2019

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Attention: Andrew Steventon

Subject: 2-6 Hassall Street, Parramatta
Construction Pedestrian and Traffic Management Plan – Demolition

Dear Andrew,

Ason Group has been commissioned to provide a Construction Traffic Management Plan (CPTMP) in relation to the demolition of the existing buildings at Lots 1, 2 and 3, DP30941 at 2b-6 Hassall Street, Parramatta (the Site) in response to Condition of Consent 27 and Development Application LDA/714/2018.

Development Application (DA) LDA/714/2018 relates to early works on the Site. Specifically, the proposed development comprises:

- Erection of Type A and Type B hoarding structure to Hassall Street.
- Demolition of existing structures on site, including:
 - a two-storey commercial building with a rear at grade car park; and
 - a three-storey residential flat building.
- Removal of two trees fronting Hassall Street; and
- Archaeological testing and salvage works.

The proposal relates to the broader site redevelopment plan which includes a future mixed-use development comprising a tertiary institution, commercial and retail uses. The future development is classified as State Significant Development and will be subject of separate DA following the completion of an Architectural Design Competition. The benefits of this approach would allow the expedited local assessment and determination of an application for these additional 'early works', which are key to ensuring the development can proceed according to the timeline for project completion in Q1 2021.

The purpose of this letter is therefore to outline the construction traffic management principles that would allow construction vehicle access in accordance with the RMS Guide and Traffic Control at Worksites (TCAW). These construction traffic management principles will seek to minimise traffic and pedestrian impacts along Hassall Street and reduce interactions with the existing neighbouring commercial and residential developments. In this regard, Ason Group has undertaken a review of all the construction traffic management requirements and now advise as follows.

1.0 Condition of Consent Requirements

1.1 Condition 27

Condition 27 states that:

Prior to the commencement of any works on site (excluding exploratory and investigative works), the applicant must submit a Construction Pedestrian and Traffic Management Plan to the satisfaction of Council's Service Manager Traffic and Transport and the Transport for NSW Sydney Coordination Office. The following matters must be specifically addressed in the Plan:

Construction Management Plan for the Site. A plan view of the entire site and frontage roadways indicating:

- (i) *Dedicated construction site entrances and exits, controlled by a certified traffic controller, to safely*

manage pedestrians and construction related vehicles in the frontage roadways,

- (ii) Turning areas within the site for construction and spoil removal vehicles, allowing a forward entry and egress for all construction vehicles on the site,*
- (iii) The locations of proposed Work Zones in the egress frontage roadways,*
- (iv) Location of any proposed crane standing areas,*
- (v) A dedicated unloading and loading point within the site for all construction vehicles, plant and deliveries,*
- (vi) Demolition program of works,*
- (vii) Material, plant and spoil bin storage areas within the site, where all materials are to be dropped off and collected,*
- (viii) The provisions of an on-site parking area for employees, tradesperson and construction vehicles as far as possible.*
- (ix) A detailed description and route map of the proposed route for vehicles involved in spoil removal, material delivery and machine floatage and a copy of this route is to be made available to all contractors.*
- (x) A detailed description of locations that will be used for layover for trucks waiting to access the construction site.*
- (xi) Proposed construction hours;*
- (xii) The SCO does not support a full closure of the footway for the works. Traffic controllers / gates can be used to briefly stop pedestrians while vehicles are entering and exiting the site. The CTMP should be updated accordingly;*
- (xiii) CTMP to be amended to include a note that trucks are not to block Hassall St at any time and that trucks turning out of site are to wait until there is sufficient and safe gap to enter the westbound lane;*
- (xiv) DWG. 01 of Attachment 1 (Swept Path Analysis) shows the 'truck & dog' turns into the site cannot be made without encroaching on the opposing carriageway. Alternative options should be investigated for this vehicle accessing the site;*
- (xv) Estimated number and type of construction vehicle movements including morning and afternoon peak and off peak movements;*
- (xvi) Construction program that references peak construction activities and proposed construction 'Staging';*
- (xvii) Any potential impacts to general traffic, cyclists, pedestrians and bus services within the vicinity of the site from construction vehicles during the construction of the proposed works;*
- (xviii) Cumulative construction impacts of projects in the Parramatta CBD. Should any impacts be identified, the duration of the impacts; and*
- (xix) Measures proposed to mitigate any associated general traffic, public transport, pedestrian and cyclist impacts should be clearly identified.*

Written concurrence from Council's Traffic and Transport Services in relation to installation of a proposed

'Works Zone' restriction in the egress frontage roadways of the development site.

Application fees and kerbside charges for 6 months (minimum) are to be paid in advance in accordance with the Council's Fees and Charges. The 'Works Zone' restriction is to be installed by Council once the applicant notifies Council in writing of the commencement date (subject to approval through Parramatta Traffic Committee processes). Unused fees for kerbside charges are to be refunded once a written request to remove the restriction is received by Council.

Traffic Control Plan(s) for the site:

- (i) All traffic control devices installed in the road reserve shall be in accordance with the NSW Transport Roads and Maritime Services publication 'Traffic Control Worksite Manual' and be designed by a person licensed to do so (minimum RMS 'red card' qualification) The main stages of the development requiring specific construction management measures are to be identified and specific traffic control measures identified for each,*
- (ii) Approval shall be obtained from City of Parramatta Council for any temporary road closures or crane use from public property.*

Where applicable, the plan must address the following:

- (i) Evidence of Roads and Maritime Services concurrence where construction access is provided directly or within 20 m of an Arterial Road,*
- (ii) A schedule of site inductions shall be held on regular occasions and as determined necessary to ensure all new employees are aware of the construction management obligations.*
- (iii) Minimising construction related traffic movements during school peak periods.*

The Construction and Traffic Management Plan shall be prepared by a suitably qualified and experienced traffic consultant and be certified by this person as being in accordance with the requirements of the abovementioned documents and the requirements of this condition.

Reason: *To ensure that appropriate measures have been considered during all phases of the construction process in a manner that maintains the environmental amenity and ensures the ongoing safety and protection of people.*

1.2 CPTMP Compliance

A summary of the CPTMP compliance with each aspect of Condition 27 is provided below for clarity.

Table 1: CPTMP Compliance with Condition 27

Reference	Requirement	Response
1	Construction Management Plan for the Site. A plan view of the entire site and frontage roadways indicating:	
i	Dedicated construction site entrances and exits, controlled by a certified traffic controller, to safely manage pedestrians and construction related vehicles in the frontage roadways	<p>The existing Site accesses are to be utilised during the demolition phase. The western access will be used for ingress and egress during the initial stages, with the largest vehicle possible to access the Site being an 8.8m Bogie. Once demolition has occurred, the largest vehicle to access the Site would be a Truck & Dog for final clearance works.</p> <p>An authorised Traffic Controller would be present throughout demolition works.</p>

Reference	Requirement	Response
ii	Turning areas within the site for construction and spoil removal vehicles, allowing a forward entry and egress for all construction vehicles on the site	As shown by the Swept Path Analysis provided as Attachment 1 , all vehicles will enter and exit the site in a forward gear. Prior to the demolition of buildings on-site, an 8.8m bogie can perform a 3-point turn between the 2 buildings on-site. Given that this CPTMP is for demolition only, which results in low truck volumes, this approach is deemed to be an appropriate arrangement.
iii	The locations of proposed Work Zones in the egress frontage roadways,	A 29m work zone has been planned on the northern kerb of Hassall Street. Section 5 and Attachment 3 has further details on the location and dimensions of the work zone. Section 7 outlines how pedestrians and cyclists shall be managed during this time.
iv	Location of any proposed crane standing areas	No cranes are required for demolition.
v	A dedicated unloading and loading point within the site for all construction vehicles, plant and deliveries	The loading area is to be between the two buildings for the initial stages, which can be accessed by an 8.8m bogie. Following the initial demolition of the buildings on-site, the loading would then occur to the north eastern corner of the site.
vi	Demolition program of works	The demolition period is expected to last between 4-8 weeks. The exact program of works is currently unconfirmed and is currently being developed.
vii	Material, plant and spoil bin storage areas within the site, where all materials are to be dropped off and collected	Site Set-up Plans have been produced by the Project Builders (reproduced as Figure 4 and Figure 5 below).
viii	The provisions of an on-site parking area for employees, tradesperson and construction vehicles as far as possible.	No parking is to be provided on-site for contractors. Noting the proximity of the Site to Parramatta Transport Interchange, most contractors are expected to travel to site by public transport.
ix	A detailed description and route map of the proposed route for vehicles involved in spoil removal, material delivery and machine floatage and a copy of this route is to be made available to all contractors.	The truck routes for both phases of demolition are discussed in Section 4.0. A copy of these routes would be made available to all contractors on-site and it would be ensured that truck drivers are aware of these routes.
x	A detailed description of locations that will be used for layover for trucks waiting to access the construction site	Given the low volumes of trucks required for the demolition phase, no truck layovers are required.
xi	Proposed construction hours.	Monday – Friday: 7AM-5PM Now works to be undertaken on Saturdays, Sundays and Public Holidays.
xii	The SCO does not support a full closure of the footway for the works. Traffic controllers / gates can be used to briefly stop pedestrians while vehicles are entering and exiting the site. The CTMP should be updated accordingly	The footway is to remain open throughout demolition. Signage would encourage pedestrians to utilise the southern footpath on Hassall Street as well along the Site frontage and Traffic Controllers would be stationed at each access to ensure pedestrian safety while trucks are accessing the site. However, the footpath would not be fully closed at any time.
xiii	CTMP to be amended to include a note that trucks are not to block Hassall St at any time and that trucks turning out of site are to wait until there is sufficient and safe gap to enter the westbound lane;	At no time are trucks to block Hassall Street and, noting that Traffic Controllers are to be present throughout to supervise the safe ingress and egress of trucks, heavy

Reference	Requirement	Response
		vehicles are to wait until there is sufficient and safe gap to enter the westbound lane.
xiv	DWG. 01 of Attachment 1 (Swept Path Analysis) shows the 'truck & dog' turns into the site cannot be made without encroaching on the opposing carriageway. Alternative options should be investigated for this vehicle accessing the site;	<p>The Swept Path Analysis has been updated to reflect the most recent layout of Hassall Street, noting that it has recently been modified from a two-way road to one-way in a westbound direction. As is illustrated by the Swept Path Analysis provided as Attachment 1, a Truck & Dog can enter the Site without impacting on the parking lane on northern side of Hassall Street.</p> <p>A Traffic Controller would be stationed on Hassall Street to halt traffic to allow heavy vehicles to safely exit the site. Given that a peak of 3 vehicles movements are expected to exit the Site during demolition, this deemed to be an acceptable arrangement.</p>
xv	Estimated number and type of construction vehicle movements including morning and afternoon peak and off peak movements	As discussed in Section 9.0, demolition works are expected to generate no more than 40 trucks arrivals per day during general operation. The peak truck movements per hour will be 6 arrival and departures (3-in and 3-out).
xvi	Construction program that references peak construction activities and proposed construction 'Staging'	As per the above, the exact staging is currently unknown however, it is expected that demolition would take approximately 4-8 weeks.
xvii	Any potential impacts to general traffic, cyclists, pedestrians and bus services within the vicinity of the site from construction vehicles during the construction of the proposed works;	<p>See Attachment 2. A site-specific TCP195 has been adopted for standard truck movements in and out of existing driveways for both access strategies.</p> <p>Noting the relatively low traffic generation expected with the demolition phase (peak hour movements of 3-in and 3-out), it is not expected to have a significant impact on the operation of the road network and would thus not delay bus services.</p> <p>Traffic controllers will be present at the access driveway with expandable barriers to facilitate pedestrian and cyclist movement across the access driveway. Traffic barriers are to be opened only when required.</p>
xviii	Cumulative construction impacts of projects in the Parramatta CBD. Should any impacts be identified, the duration of the impacts	<p>Refer to Section 9.0.</p> <p>As we understand the coordination of all construction activities is currently being managed by Sydney Coordination Office to ensure appropriate measures are in place to prevent combined impacts of construction traffic. The Project Managers / Builders will liaise with the SCO to minimise cumulative construction impacts.</p> <p>It is reiterated that this CPTMP is for demolition only, which represents a less intensive phase of construction than later ones. Regardless of this, the Project Managers / Builders are committed to regularly communicating with the other construction sites regarding all major construction activities and coordinate to minimise overlap where possible.</p>
xix	Measures proposed to mitigate any associated general traffic, public transport, pedestrian and cyclist impacts should be clearly identified	The Traffic Control Plans have been designed to reduce traffic impacts at the Site accesses on pedestrians and cyclists and the haulage routes have been designed to ensure the most direct route to the external road network.
2	Traffic Control Plan(s) for the site:	

Reference	Requirement	Response
i	All traffic control devices installed in the road reserve shall be in accordance with the NSW Transport Roads and Maritime Services publication 'Traffic Control Worksite Manual' and be designed by a person licensed to do so (minimum RMS 'red card' qualification) The main stages of the development requiring specific construction management measures are to be identified and specific traffic control measures identified for each	Please refer to Attachment 2 for the Traffic Control Plans. A total of 3 Traffic Controllers are required for the demolition phase of construction.
ii	Approval shall be obtained from City of Parramatta Council for any temporary road closures or crane use from public property.	No road closures or crane use from public property is required as part of the demolition phase.
3	Where applicable, the plan must address the following	
i	Evidence of Roads and Maritime Services concurrence where construction access is provided directly or within 20 m of an Arterial Road	N/A
ii	A schedule of site inductions shall be held on regular occasions and as determined necessary to ensure all new employees are aware of the construction management obligations.	Site inductions will be held regularly to ensure that contractors are aware of the construction management obligations.
iii	Minimising construction related traffic movements during school peak periods	Given the low truck volumes expected during demolition (6 vehicles movements during the peak hour and 40 per day), demolition is not expected to materially impact the road network during school peak hours.

2.0 Context

Legally known as Lots 1, 2 and 3, DP30941 at 2-6 Hassall Street, Parramatta, the future commercial development is located within the City of Parramatta Council LGA within the Parramatta CBD. An aerial view of the Site (as of October 2018) is presented in **Figure 1** below in relation with the surrounding developments and roads.

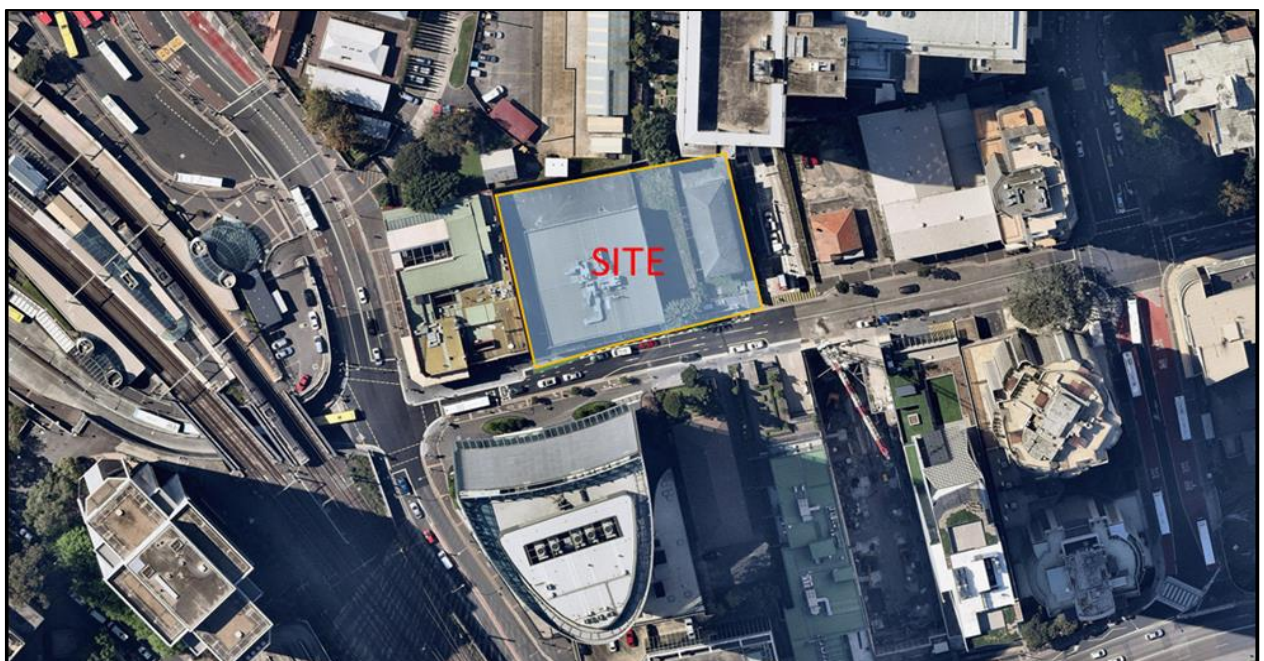


Figure 1: Site Location

3.0 Construction Details

Key details in relation to demolition of the site are as follows:

- Largest vehicle size: 19.6m Truck and Dog
- Typical vehicle size: 8m Bogie Tippers, 12.5m Heavy Rigid Vehicle and 19.6m Truck and Dog
- Vehicle arrivals: **Circa** 30-40 per day
- Average workforce: 20-30 persons
- Duration: 4-8 weeks from the commencement date
- Hours of operation: Monday to Friday 7AM – 5PM
(Will be in accordance with the Conditions of Consent)

It should be noted that the commencement date and program of works is currently unconfirmed. However, it is expected that works are to begin late January / early February (2019).

4.0 Truck Routes and Site Access

The key roads in the vicinity of the Site are as shown in **Figure 2** and are described in the following sections.

Vehicles will access the site using the arterial road system and will be required to undertake the turning movements shown in Figure 2 and **Figure 3** below. All vehicles will enter and exit in a forward direction via Hassall Street.

During the initial phase the maximum size truck to access the site is limited to an 8.8m Bogie due to site constraints. During the early phases, trucks will access the site by reversing into the westernmost access, conduct a 3-point turn manoeuvre within the site and exit via the same access in a forward direction, as shown by the swept path analysis provided as **Attachment 1**. Given the low truck volumes experienced during demolition, this is deemed to be an appropriate arrangement, noting that an RMS authorised Traffic Controller will be provided at the access driveway.

Once the buildings on-site have been demolished, the maximum size vehicle to access the site would be a 19.6m Truck & Dog during the final site clearance works. As shown by the swept analysis in Attachment 1, trucks would enter the site via the westernmost access and exit via the easternmost access, with an additional Traffic Controller provided at the easternmost access.

Heavy vehicles travelling to the Site can enter via one primary route:

- Enter via the M4 onto the A44 Great Western Highway, then onto Parkes Street, turn left onto Wigram Street, left into Hassall Street and then turn right into the Site's existing western access, which will require minor modification to accommodate the required movement.

Heavy vehicles leaving the Site will exit left onto Hassall Street and re-access the arterial road network via the following route:

- Turn right onto Wigram Street and then right onto Parkes Street. From Parkes Street, the A44 Great Western Highway can be accessed which in turn provides access to the M4.

For exiting vehicles, another Traffic Controller would be provided to halt traffic on Hassall Street to allow construction vehicles to safely exit the Site. This is deemed to be acceptable given the low traffic volumes expected during demolition. Notably, a peak of 3 vehicles per hour is expected to exit the Site via this access and, given that traffic would be halted for approximately 15 seconds, it would not have a material impact on traffic travelling along Hassall Street.

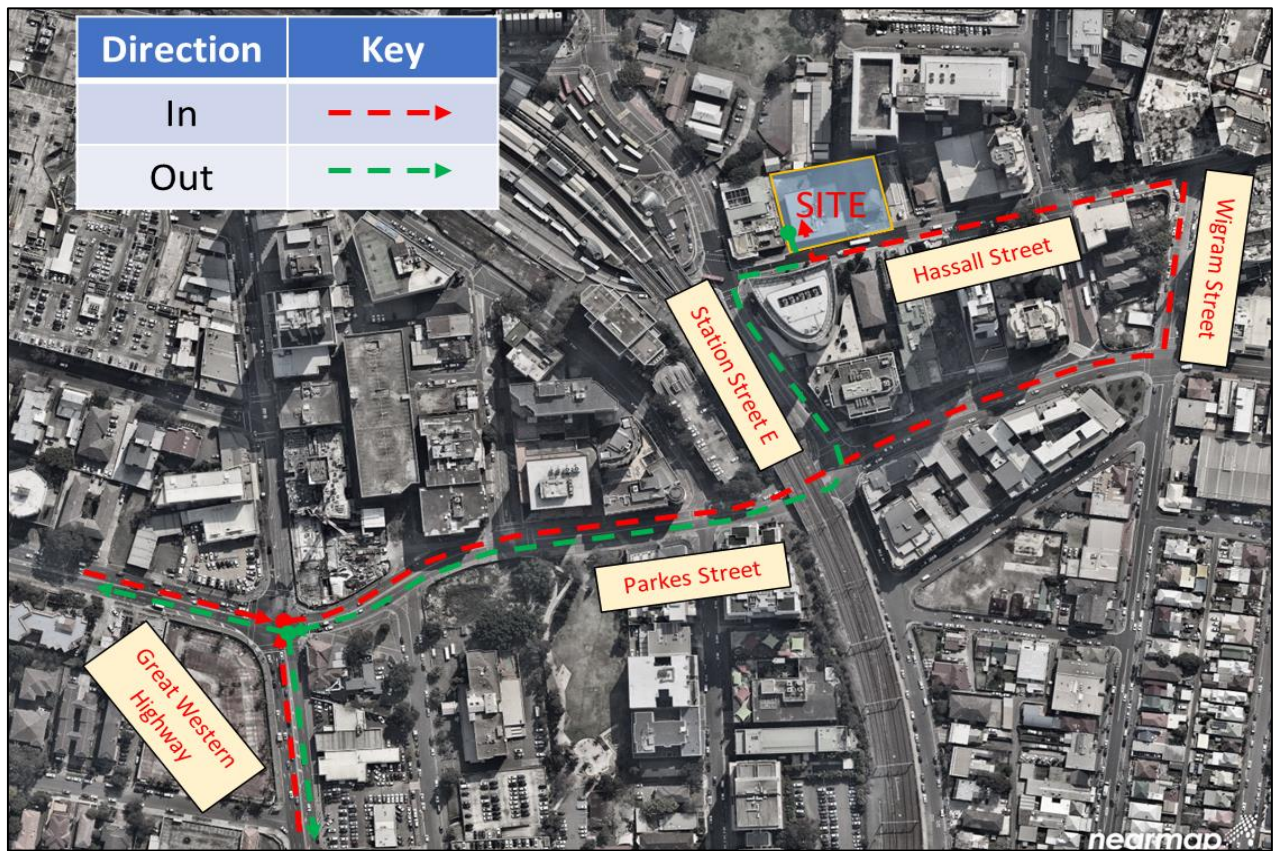


Figure 2: Proposed Truck Routes (Early Phases)

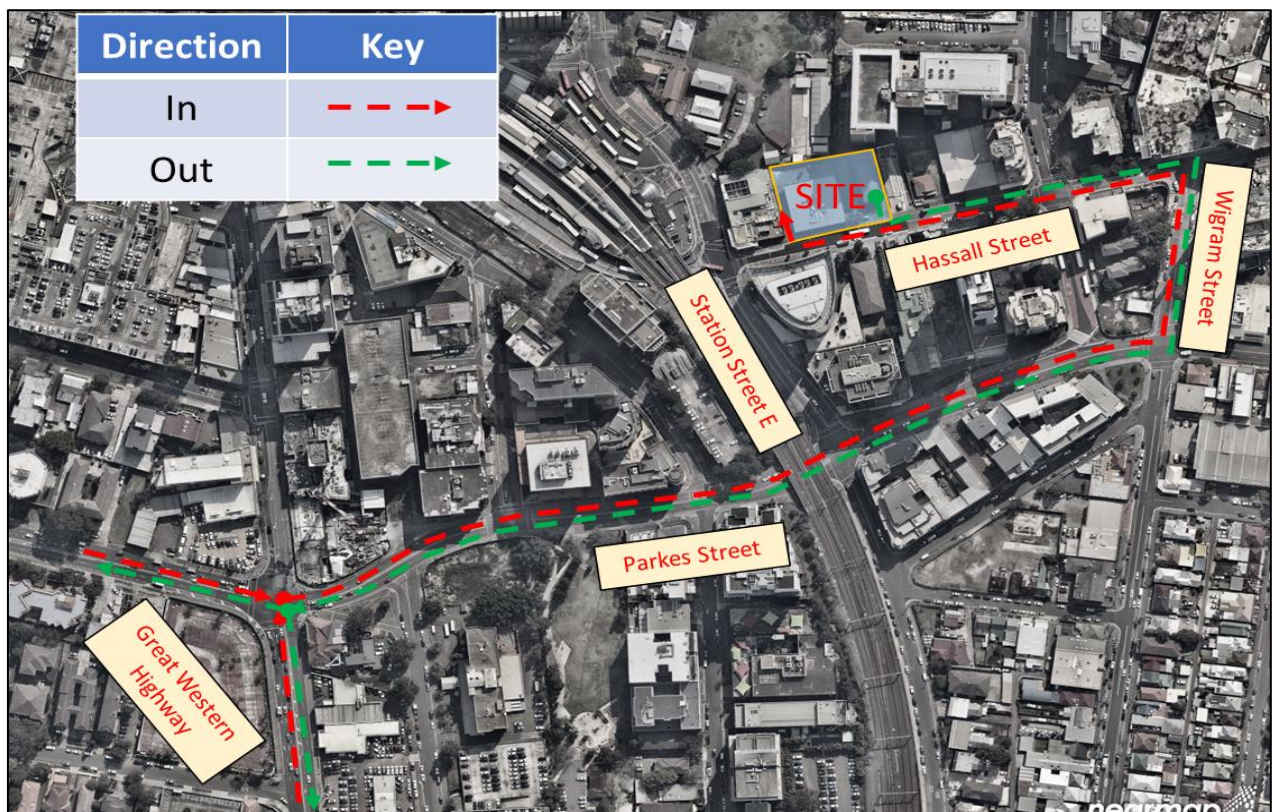


Figure 3: Proposed Truck Routes (19.6m Truck & Dog)

5.0 Work Zone

To assist in enabling trucks to safely access the site, and in response from correspondence from Council, a Work Zone shall be installed fronting the site along Hassell Street. The Work Zone shall be 29m in length and shall be provided to assist with vehicular access to western most driveway.,

The Work Zone would require the temporary restriction of parking along the Site frontage and concrete median which separates the cycle path from the parking lane. The cycle path is to remain open to cyclists throughout this period. These would be reinstalled once the Work Zone is removed.

Having regard for the above, the provision of a Work Zone is a key element of the required construction methodology for demolition works and the associated Construction Traffic Management Plan outlined in the body of this report.

6.0 Traffic Control Plan

The RMS guide “Traffic Control at Worksites” (TCAW) manual contains standard traffic control plans (TCPs) for a range of work activities. The manual objective is to maximise safety by ensuring traffic control at worksites complies with best practice. The RMS TCAW outlines the requirement for a Vehicle Movement Plan (VMP).

A VMP is a diagram showing the preferred travel paths for vehicles associated with a work site entering, leaving or crossing the through traffic stream. A VMP should also show travel paths for trucks at key points on routes remote from the work site such as places to turn around, accesses, ramps and side roads.

On roads with approach speeds of less than 80 km/hr but more than 60km/hr, with vehicle movements >20 veh/shift, and sight distance is more than $2d$ (where d equals the posted speed limit and in this instance the sight distance is required to be up to 120 metres), the following is required by the RMS TCAW:

- TCP with Traffic controllers/Traffic Signals N/A
- VMP N/A
- Warning Signs required during shifts N/A

Notwithstanding, it is proposed to implement the TCP 195 for the initial stage of demolition and TCP 77 for the final stages, as shown in **Attachment 2**. These TCPs are site-specific versions of TCP 195 and TCP 77. A VMP has been addressed with the Truck Routes shown in Figure 2 and Figure 3 and the swept path analysis at the Site access points is shown in Attachment 1.

7.0 Authorised Traffic Controller

An authorised Traffic Controller will be present throughout the demolition stage of the project. The responsibilities include:

- Supervision of all vehicle movements across pedestrian footpaths at all times, and
- Supervision of all loading and unloading of construction materials during the deliveries in the demolition phase of the project.
- Pedestrian management, to ensure that adverse conflicts between vehicle movements and pedestrians do not occur, while maintaining radio communication with construction vehicles at all times.
- Traffic Controllers shall manage cyclists within the dedicated bike lane to ensure their safety during adverse truck movements across the footpath – similar to pedestrian management outlined above.

8.0 Implementation of the Plan

8.1 Site Plan

Figure 4 and **Figure 5** provides the layout for the Site during both demolition phases of construction.



Figure 4: Demolition Site Management Plan Phase 1



Figure 5: Demolition Site Management Plan Phase 2

8.2 Fencing and Site Security

Exclusion fencing will be erected along the entire boundary of the site and will be maintained for the duration of the construction program. The fencing would be at least 1.8m high and is to ensure unauthorised persons are kept out of the site. Site access gates would be provided at the site accesses on Hassall Street and will be closed at all times outside of the permitted construction hours.

Security fencing will be installed along the perimeter of the Site to ensure that construction activities do not interfere with the operations of the surrounding developments.

8.3 Pedestrian and Cyclist Safety

Given its proximity to the Parramatta Transport Interchange (train and bus station), Hassall Street provides a direct pedestrian desire line, with high levels of pedestrian activity along the site's southern frontage.

As such 1 Traffic Controller will be provided at each access driveway to assist pedestrians crossing the driveway between truck arrival and departures. A physical barrier will be provided by installing an expandable barrier (pedestrian boom gate or equivalent) on both sides of the driveway. This would be operated by an RMS authorised Traffic Controller when construction vehicles are on approach to site / ready to depart from site only and would be kept aside and compressed when not in operation. Once the construction vehicles have wholly entered or exited the site, the Traffic Controller can allow the pedestrians and cyclists to continue along their journey. The Contractor shall make clear to Traffic Controllers that pedestrians have right of way and, as far as reasonable, direct vehicles to enter the site in gaps between pedestrians.

Further, a Type A and Type B hoarding structure will be installed on Hassall Street along the site frontage to ensure the safety of pedestrians.

It is noted that the footpath is to remain open for the duration of demolition.

8.4 Vehicular Movements

Construction vehicles will undertake movements as outlined in Figure 2 and Figure 3. Reference should be made to the swept paths provided in Attachment 1 which demonstrate access and egress to/from the site in a forward gear. All turning movements would occur within the Site during demolition.

Once initial demolition works have been completed, there would be space and opportunity for vehicles to turn around in the Site and exit in a forward direction. The swept paths provided in Attachment 1 demonstrate the most appropriate turning manoeuvre until demolition has occurred.

Finally, it is noted that construction vehicles would not block Hassall Street at any time and that heavy vehicles turning out of the site are to wait until there is sufficient and safe gap to enter the westbound lane.

9.0 Traffic Impacts

9.1 Traffic Generation

As discussed above, the construction works are expected to generate no more than 40 trucks arrivals per day during general operation. The peak truck movements per hour will be 6 arrival and departures.

The proposed Traffic Control Plan will have minimal impact on passing traffic volumes with through movements to be maintained at all times and vehicles to exit the Site only when provided with suitable gaps.

Accordingly, it is concluded that the proposed demolition works will have minimal impact on the performance of the surrounding road network.

9.2 Parking and Loading

No parking will be provided on-site for construction workers driving to site. On-street parking around the site is mostly restricted or controlled so it is expected that those who are required to drive would utilise public car parks or further afield on-street car parking. The remainder of workers are expected to utilise the public transport services, noting the site's proximity the Parramatta Transport Interchange.

Loading and unloading of all vehicles will occur on-site, which will ensure no queueing along Hassall Street at any time. It is expected that a schedule for deliveries of materials and goods will be established prior to that day, with Traffic Controllers maintaining radio contact with construction vehicles at all times. Thus, at no stage shall queueing occur on the public road network.

9.3 Cumulative Construction Traffic Impacts

This CPTMP considers the surrounding construction activities within the 250m radius of the Site, as shown by **Figure 6** these are:

- 9 Hassall Street
- 21 Hassall Street
- 23-29 Hassall Street
- 95-101 George Street

The most efficient route to and from the construction site at 95-101 George Street to the external road network would be in an eastbound direction along George Street and onto James Ruse Drive via Hassall Street. Construction traffic would therefore not coincide with that generated by the Site, which as shown by Figures 2 and 3, is to travel from a western direction.

Further, 21 and 23-29 Hassall Street are nearing completion. Thus, the key construction site in the vicinity of the Site is 9 Hassall Street.

It should that this CPTMP considers the initial demolition stage of construction which is far less intensive than future stages which involve concrete pours. Regardless of this, the Project Managers will request a copy of the 9 Hassall Street CPTMP (which is not currently publicly available) to review it as part of this CPTMP's monitoring and review process. This is to ensure appropriate measures are undertaken to ameliorate combined construction traffic impacts.

Further communications between the Project Manager / Builder and the SCO will be required to ensure appropriate measures are in place to prevent combined impacts of construction traffic. The SCO would be kept informed of the progress of works on the Site and any changes required to the timeframes of works. Further, the Project Manager / Builder would liaise regularly with the surrounding Construction Site Managers to avoid conflict of large deliveries and to ensure that the cumulative construction impacts are minimised.

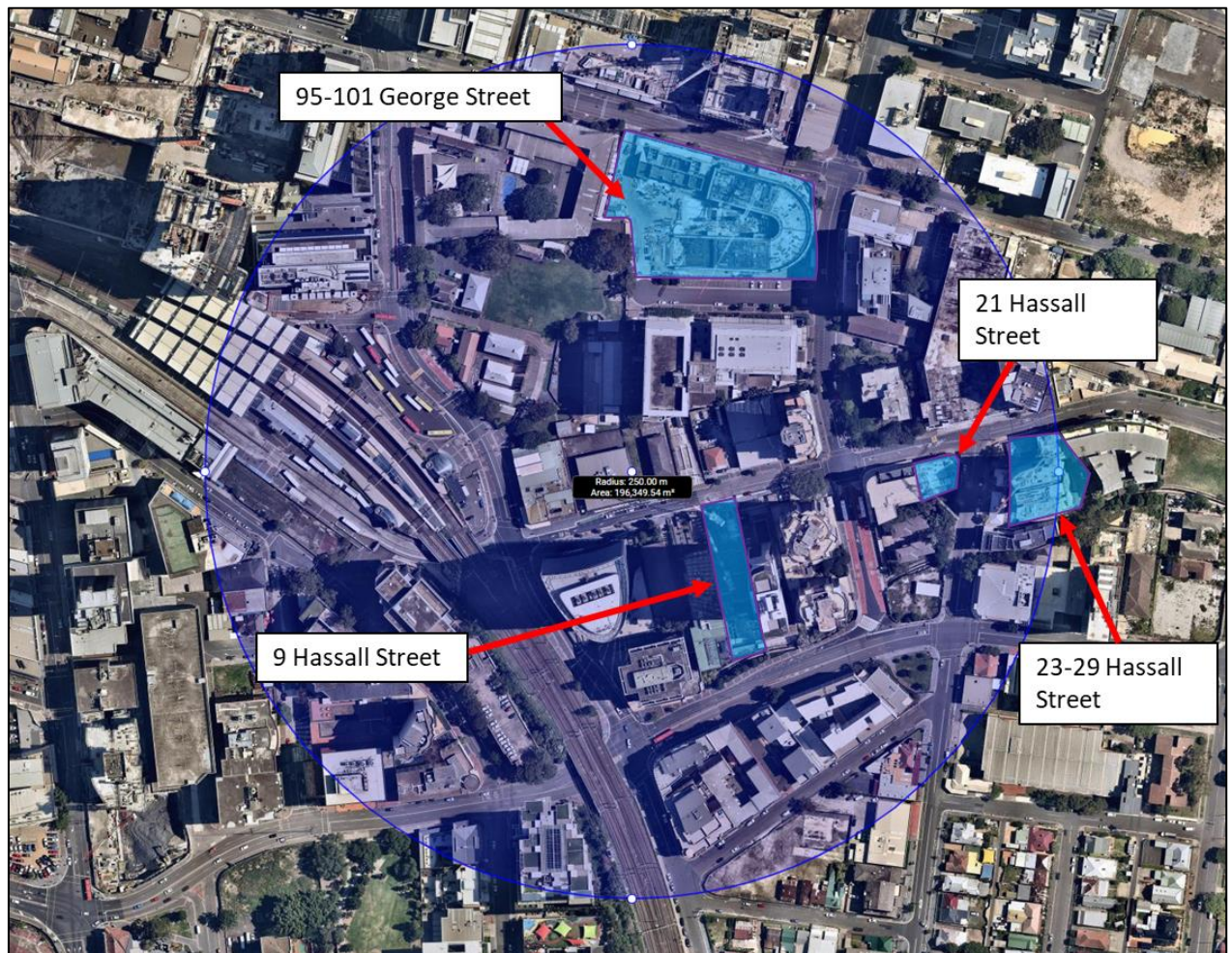


Figure 6: Construction Sites within 250m radius of 2-6b Hassall Street

10.0 Summary

This CPTMP advice has been prepared to address truck access to 2-6b Hassall Street, Parramatta associated with demolition works. Further CPTMPs will be submitted to Council which consider excavation and construction stages separately.

This document has been prepared having regard for the principles outlined in the RMS Traffic Control at Worksites Manual (2010) and AS1742.3 and is recommended for adoption. It is clear from the assessment undertaken that access can be provided for construction vehicles in accordance with the RMS TCAW requirements.

Should you have any questions, or should you wish to discuss the application further, please contact the undersigned.

Yours faithfully,

Rebecca Butler-Madden

Traffic Engineer – Ason Group

Email: rebecca.bmadden@asongroup.com.au

Attachment 1 – Swept Path Analysis



Revision notes:

Rev:	Date:	Notes:

For information purposes only - not for construction

Drawn By:

JL

Client:

Solutions Consulting Australia

Project:

P0772
2-6 Hassall Street, Parramatta

Drawing Title:

Truck & Dog Swept Path Analysis
Western Access - Arrival Early Phases

Date:

25/09/2018

Scale @ A3:

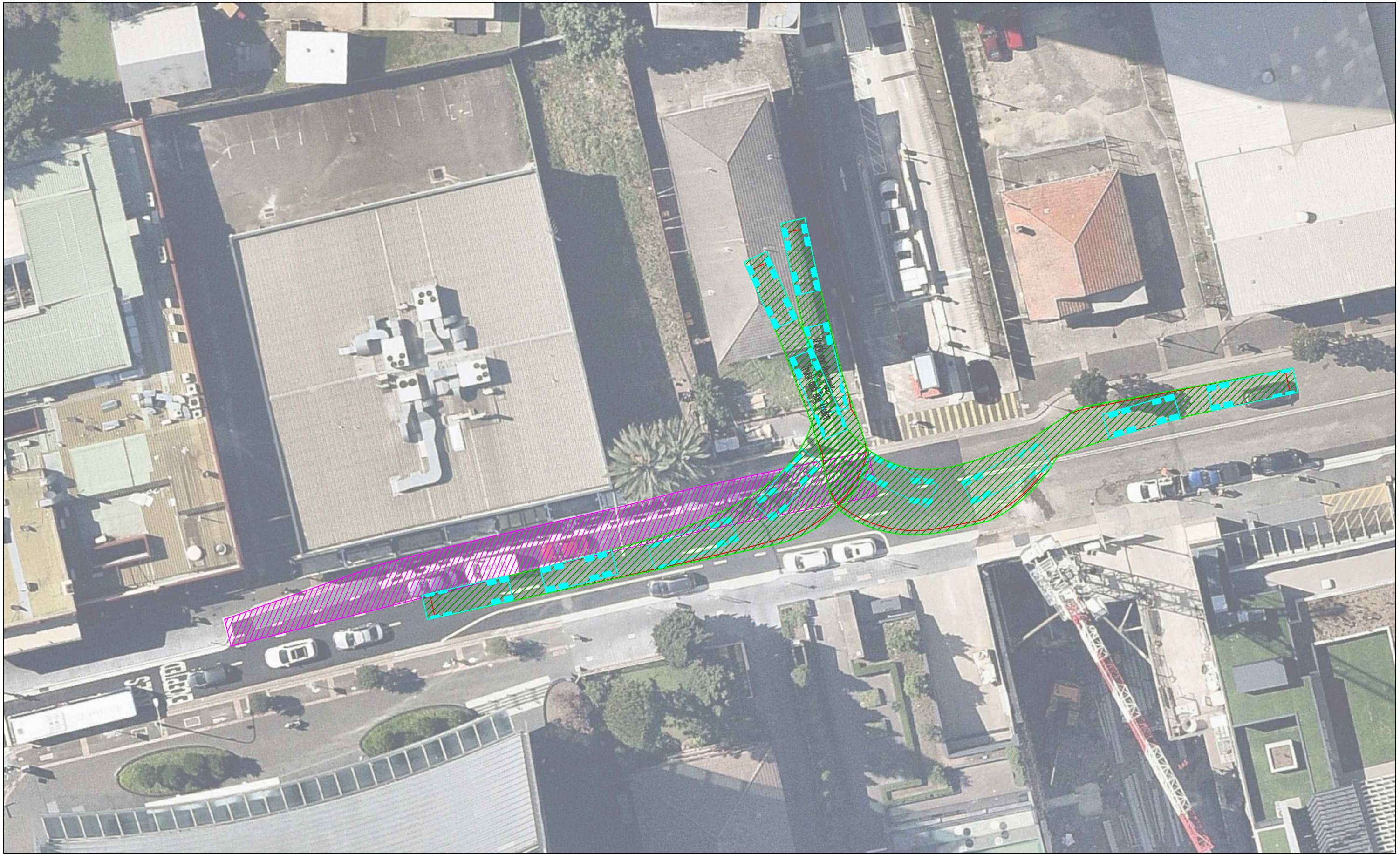
Drawing Number:

AG.01

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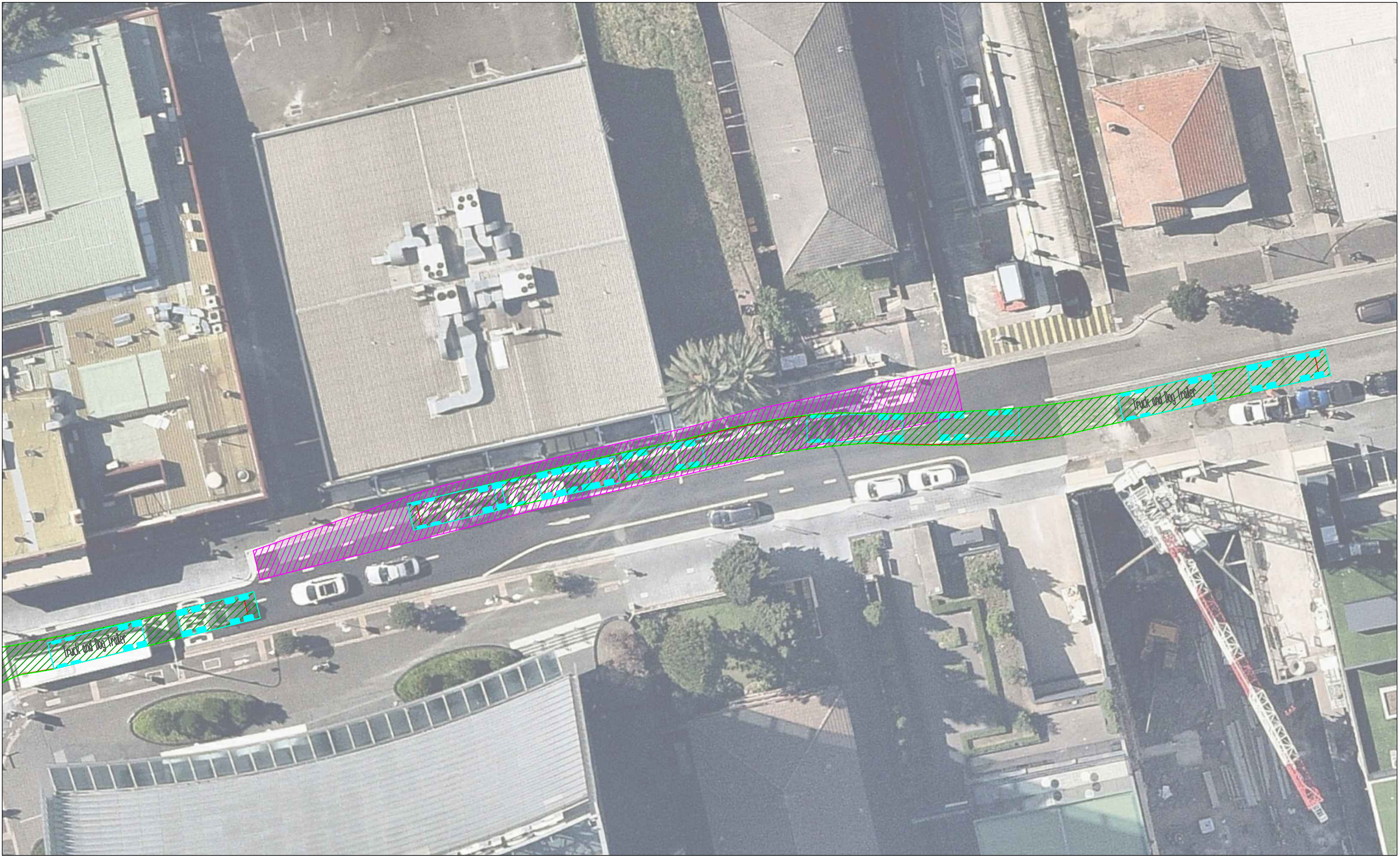
Revision notes:		
Rev:	Date:	Notes:
For information purposes only - not for construction		

Drawn By: JL
Client: Solutions Consulting Australia

Project: P0772 2-6 Hassall Street, Parramatta
Drawing Title: Truck & Dog Swept Path Analysis Eastern Access - Departing Early Phases

Date: 25/09/2018
Scale @ A3:
Drawing Number: AG.02

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Revision notes:		
Rev:	Date:	Notes:

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Drawn By: JL
Client: Solutions Consulting Australia

Project: P0772 2-6 Hassall Street, Parramatta
Drawing Title: Truck & Dog Swept Path Analysis Workzone

Date: 25/09/2018
Scale @ A3:
Drawing Number: AG.03



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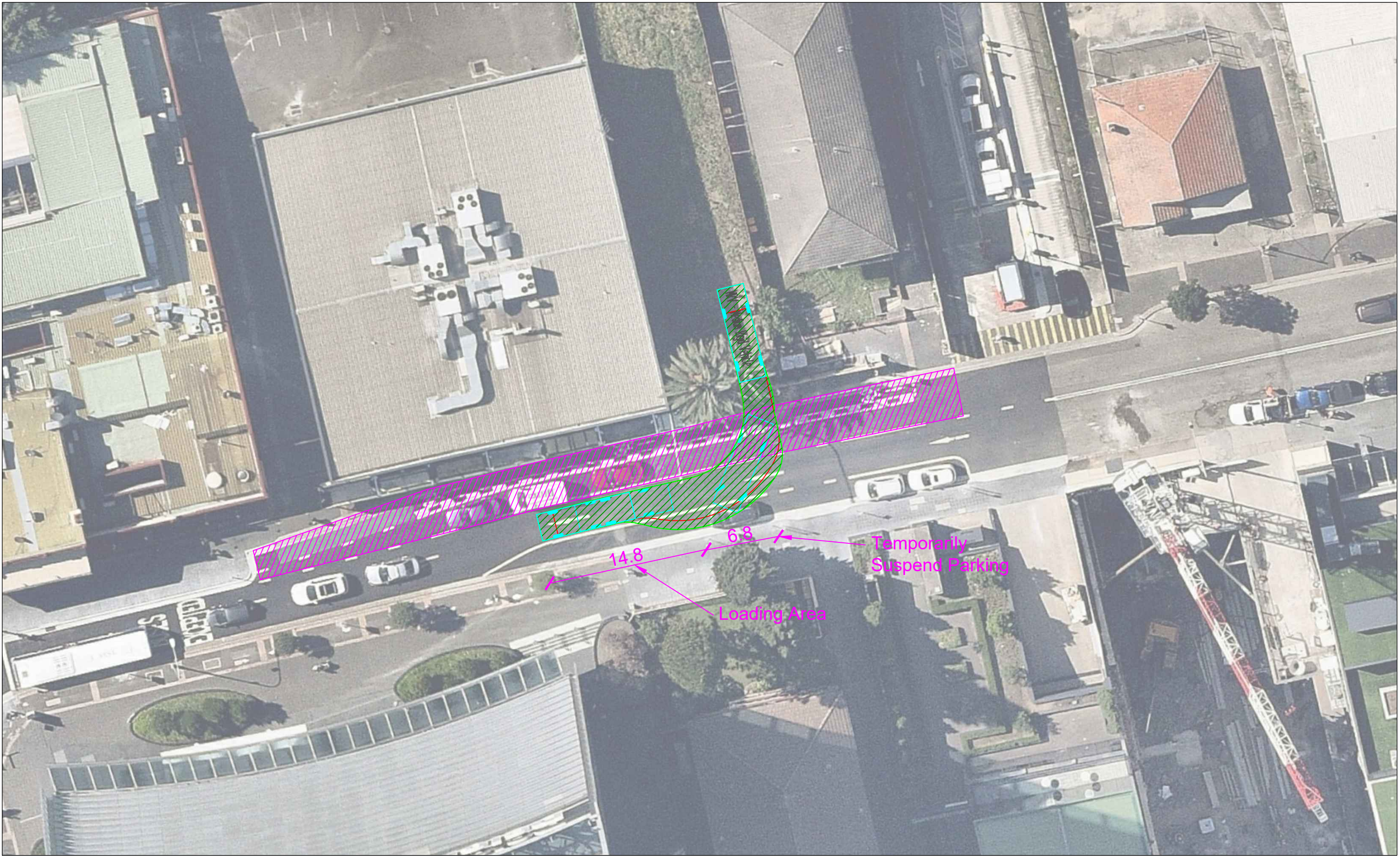
Revision notes:		
Rev:	Date:	Notes:
For information purposes only - not for construction		

Drawn By: JL
Client: Solutions Consulting Australia

Project: P0772 2-6 Hassall Street, Parramatta
Drawing Title: 8.8m Bogie Swept Path Analysis Central Access - Arrival (Reversing into Site)

Date: 19/02/2019
Scale @ A3:
Drawing Number: AG.04

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Revision notes:		
Rev:	Date:	Notes:

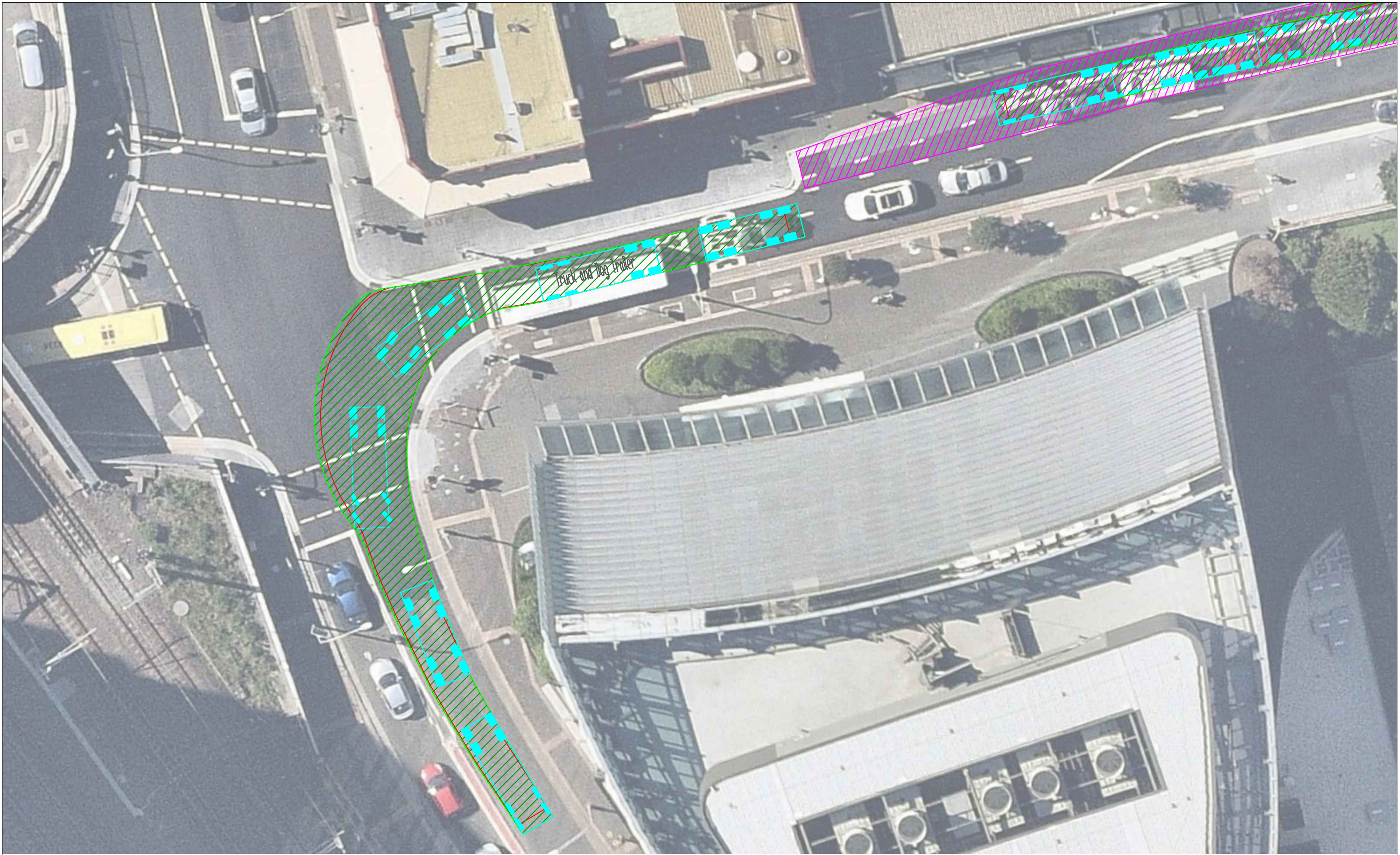
For information purposes only - not for construction

Drawn By: JL
Client: Solutions Consulting Australia

Project: P0772 2-6 Hassall Street, Parramatta
Drawing Title: Truck & Dog Swept Path Analysis Central Access Departure

Date: 25/09/2018
Scale @ A3:
Drawing Number: AG.05

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Revision notes:		
Rev:	Date:	Notes:
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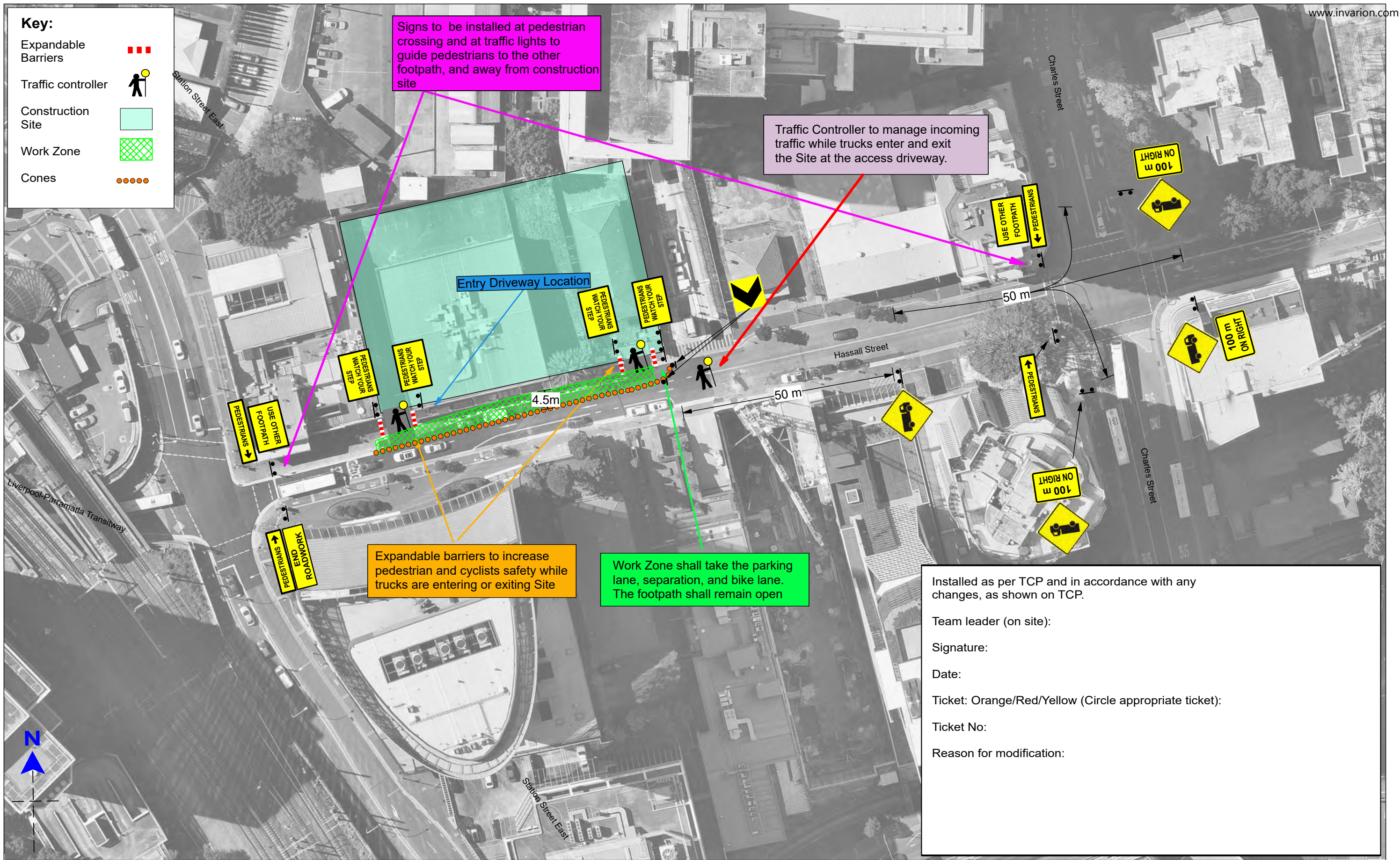
Drawn By: JL
Client: Solutions Consulting Australia



Project: P0772 2-6 Hassall Street, Parramatta
Drawing Title: Truck & Dog Swept Path Analysis Left on to Station Street East

Date: 25/09/2018
Scale @ A3:
Drawing Number: AG.06






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Attachment 2 – TCPs



NOTES <ul style="list-style-type: none">- All vehicles to have flashing orange lights- Ensure signs are visible to vehicles- Cover vehicle required for hard protection while TC's or workers are exposed to live traffic- All staff to have reflective safety vests- All signs to be Class 1 retro-reflective- Maintain daily logs of ALL activities- This PVMP is drawn in accordance with AS1742.3, the RTA's TCWS Manual & WHS Manual	<ul style="list-style-type: none">- All staff to have reflective safety vests- All trucks are to have prior notice of UHF channel to radio Foreman on arrival	Closure: Site Access Footpath Open Client: Solutions Consulting Australia	Project: Job No: 0772 Address: 2 - 6 Hassall Street, Parramatta Drawing Title: 0772-TCP-03v1-Hassall St_Parramatta	Date: 21/02/2019 Scale @ A3: Drawing Number: TCP.03	 DESIGNER: JAMES LAIDLER CERT: 0034322012 
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Key:

- | | |
|---------------------|---|
| Expandable Barriers |  |
| Traffic controller |  |
| Construction Site |  |
| Work Zone |  |
| Cones |  |

Signs to be installed at pedestrian crossing and at traffic lights to guide pedestrians to the other footpath, and away from construction site

Traffic Controller to manage incoming traffic while trucks enter and exit the Site at the access driveway.

Entry & Exit Driveway Location



Expandable barriers to increase pedestrian and cyclist safety while trucks are entering or exiting Site

Arrive early to take out the single parking and half the loading zone opposite the access driveway. Workers to move cones as needed to assist trucks entering and leaving the site.

Work Zone shall take the parking lane, separation, and bike lane. The footpath shall remain open

Installed as per TCP and in accordance with any changes, as shown on TCP.

Team leader (on site):

Signature: _____

Date:

Ticket: Orange/Red/Yellow (Circle appropriate ticket):

Ticket No:

Reason for modification:

NOTES

- All vehicles to have flashing orange lights
- Ensure signs are visible to vehicles
- Cover vehicle required for hard protection while TC's or workers are exposed to live traffic
- All staff to have reflective safety vests
- All signs to be Class 1 retro-reflective
- Maintain daily logs of ALL activities
- This PVMP is drawn in accordance with AS1742.3, the RTA's TCWS Manual & WHS Manual

- All staff to have reflective safety vests
- All trucks are to have prior notice of UHF channel to radio Foreman on arrival

Closure:

Site Access
1 x Access

Client:

Solutions Consulting Australia

Project:

Job No: 0772
Address: 2 - 6 Hassall Street, Parramatta

Drawing Title:

0772-TCP-05v1-Hassall St Parramatta

		Date:
--	--	--------------

21/02/2019

Scale @ A3:

Drawing Number:
TCP.05

asongroup

DESIGNER: JAMES LAIDLER
CERT: 0034322012

Attachment 3 – Signage Plan

Key:

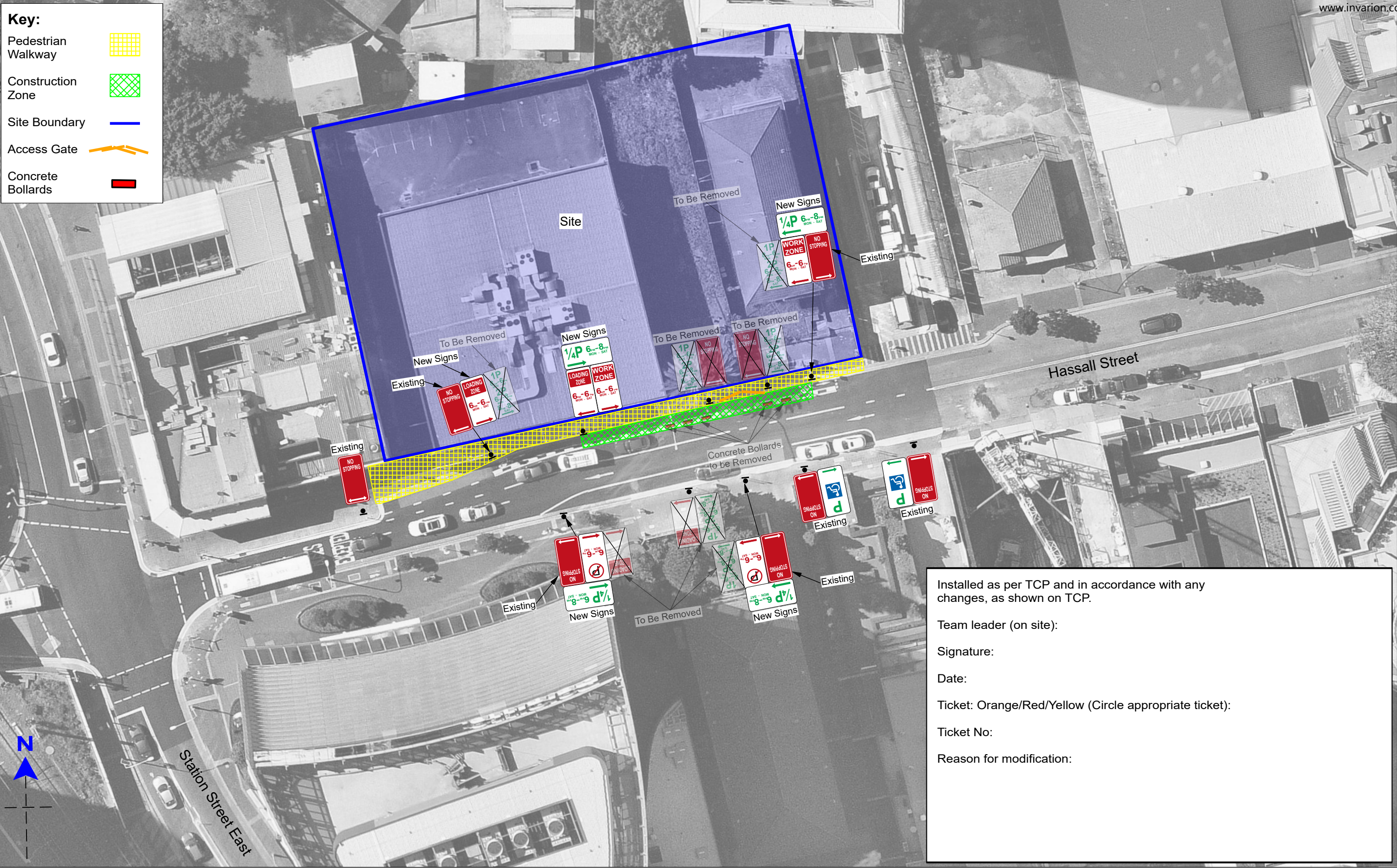
Pedestrian Walkway

Construction Zone

Site Boundary

Access Gate

Concrete Bollards



Installed as per TCP and in accordance with any changes, as shown on TCP.

Team leader (on site):

Signature:

Date:

Ticket: Orange/Red/Yellow (Circle appropriate ticket):

Ticket No:

Reason for modification:

NOTES

- All vehicles to have flashing orange lights
- Ensure signs are visible to vehicles
- Cover vehicle required for hard protection while TC's or workers are exposed to live traffic
- All staff to have reflective safety vests
- All signs to be Class 1 retro-reflective
- Maintain daily logs of ALL activities
- This PVMP is drawn in accordance with AS1742.3, the RTA's TCWS Manual & WHS Manual

- All staff to have reflective safety vests
- All trucks are to have prior notice of UHF channel to radio Foreman on arrival

Closure:
Signage Plan

Client:
Solutions Consulting Australia

Project:
Job No: 0772
Address: 2 - 6 Hassall Street, Parramatta

Drawing Title:
0772-SP-06-Hassall St_Parramatta

Date:
20/02/2019

Scale @ A3:

Drawing Number:
TCP.06

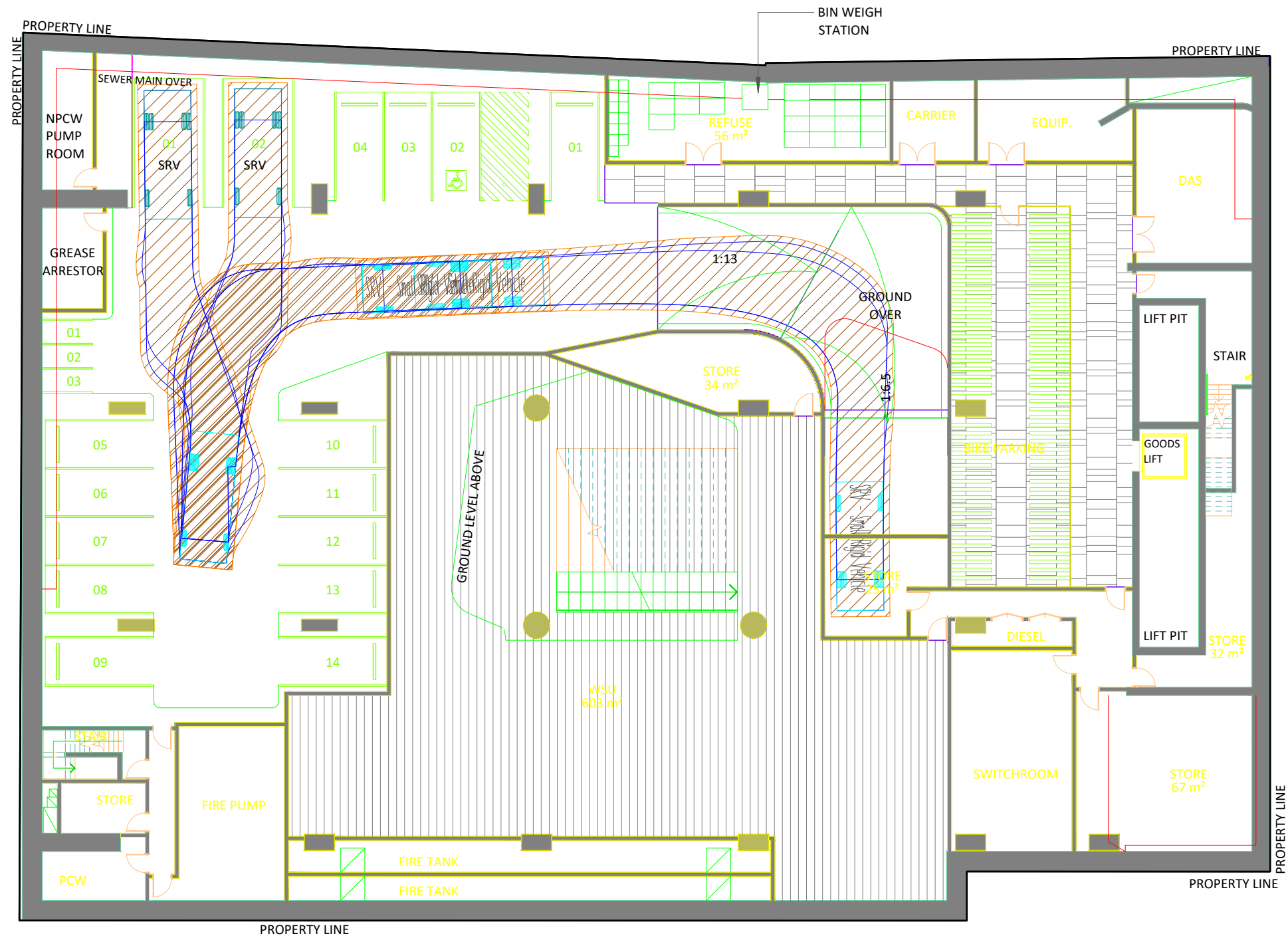
asongroup

DESIGNER: JAMES LAIDLER
CERT: 0034322012

Handwritten signature

Appendix B

Swept Path Analysis



Revision notes:

Rev:	Date:	Notes:

For information purposes only - not for construction

Drawn By:

RBM

Client:

Solutions Consulting Australia

Project:

0772d06
2-6 Hassall Street

Drawing Title:

Loading Dock - 6.4m SRV Entry

Date:

02/04/2019

Scale @ A3:

1:250

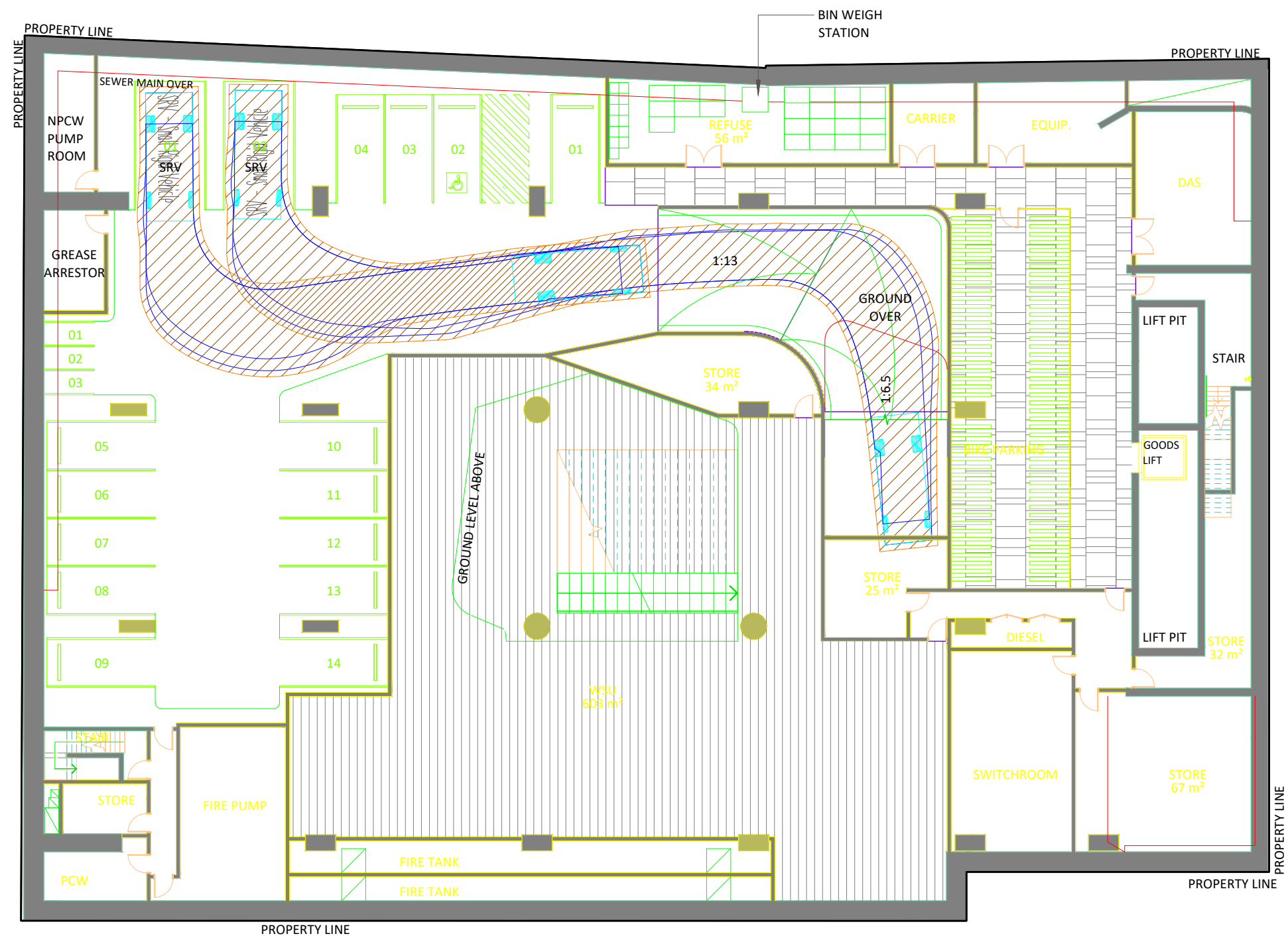
Drawing Number:

01

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Revision notes:

Rev:	Date:	Notes:

For information purposes only - not for construction

Drawn By:

RBM

Client:

Solutions Consulting Australia

Project:

0772d06
2-6 Hassall Street

Drawing Title:

Loading Dock - 6.4m SRV OUT

Date:

02/04/2019

Scale @ A3:

1:250

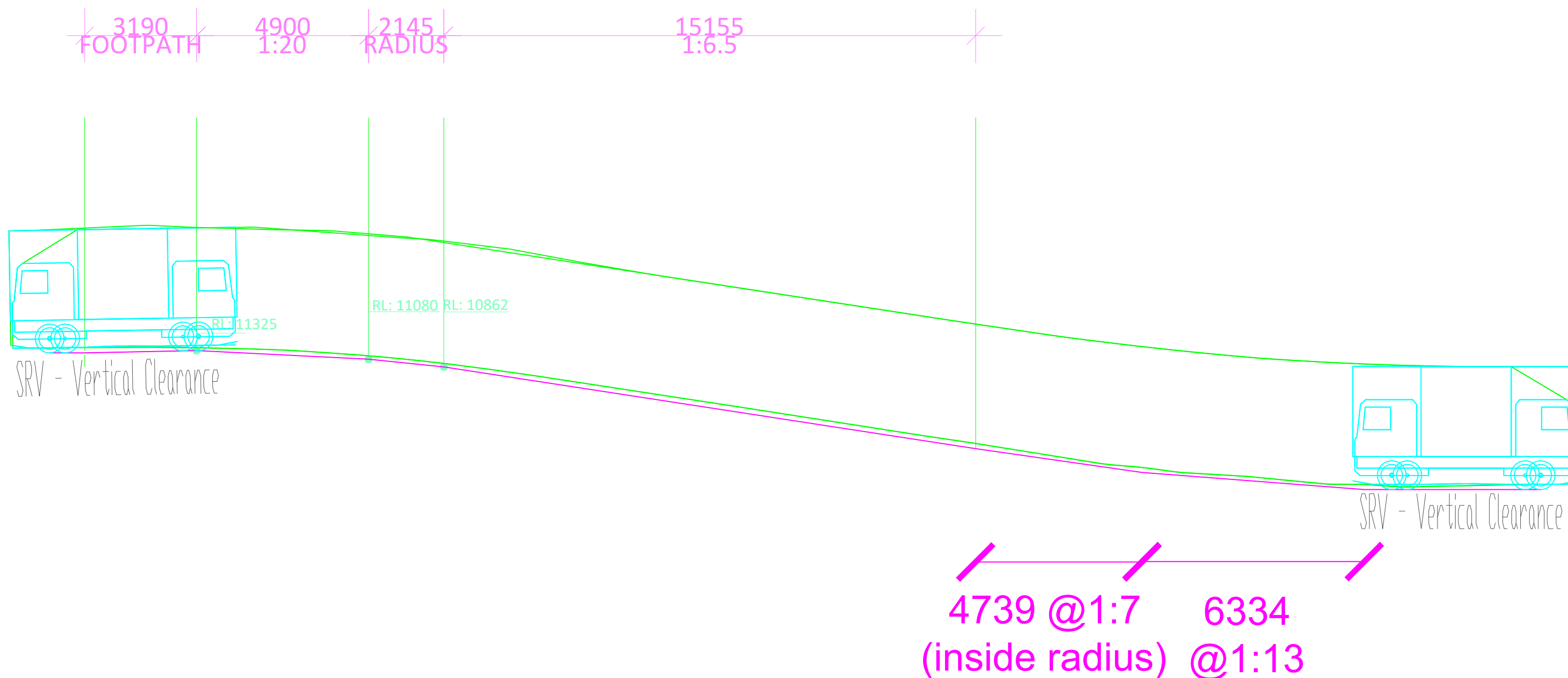
Drawing Number:

02

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Revision notes:		
Rev:	Date:	Notes:

For information purposes only - not for construction

Drawn By: RBM	Project: 0772d04 2-6 Hassall Street	Date: 22/03/2019
Client: Solutions Consulting Australia	Drawing Title: SRV Clearance	Scale @ A3: 1:250
		Drawing Number: 03

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