TTW Structural Civil Traffic Façade

Transport and Accessibility Impact Assessment

Upgrades to Melrose Park Public School

Prepared for NSW Department of Education

1 April 2025

241731

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Revision Register

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Executive Summary

This Transport and Accessibility Impact Assessment (TAIA) has been prepared by TTW on behalf of the NSW Department of Education (DoE) to assess the potential environmental impacts of the proposed upgrade of Melrose Park Public School (MPPS). This report supports a Review of Environmental Factors (REF) and addresses the traffic and transport impacts of the proposed upgrade. A preliminary Construction Traffic Management Plan (CTMP) and a preliminary School Transport Plan (STP) have also been prepared separately as part of the REF application.

The existing school operates with approximately 185 students and 22 staff. The proposed upgrade is intended to be completed by 2027 providing a maximum capacity of 720 students and 50 staff. The proposed upgrade also includes a new preschool. It will have a maximum capacity of 60 students and 5 staff.

The development of the Melrose Park Precinct is underpinned by a Transport Management and Accessibility Plan (TMAP). The TMAP has been endorsed by Transport for NSW (TfNSW) and is required to be used as a supporting technical document for all new developments within Melrose Park Precinct, including the proposed public school upgrade. The MPPS proposal has reviewed and made reference to the TMAP throughout, and the proposal is aligned with the overall transport strategies and objectives set out in the TMAP. The overall transport strategy across all elements of the school have also been discussed with City of Parramatta Council (CoP) and TfNSW during a pre-lodgement consultation stream of Transport Working Group (TWG) meetings.

The holistic transport strategy for the school prioritises active transport (i.e. walking and cycling) and public transport over private vehicle movements. This is consistent with NSW state government policy and is a core part of School Infrastructure NSW's (SINSW) ongoing commitment to sustainable transport across its portfolio of projects. Within the context of the Melrose Park Precinct development and the proposed reduction in school catchment intake area, the increased reliance on active and public transport over private vehicle travel is reasonable and achievable.

In order to encourage and prioritise active transport, the proposal will provide external infrastructure improvements such as footpath widening upgrades that tie into existing pedestrian crossings. Furthermore, internal infrastructure including bicycle storage and end-of-trip facilities (for staff) will be provided on-site. This scope of works has been developed through the TWG consultation stream and will be provided as part of this REF proposal. The proposed active transport works will operate in conjunction with existing facilities and will connect to a broader network of infrastructure upgrades being delivered as part of the Melrose Park Precinct Parramatta Light Rail Stage 2 (PLR Stage 2) and Melrose Park High School (MPHS) development. MPHS proposals include, 2 new raised crossing on Wharf Road and Hope Street, footpath widening along the western footpath of Wharf Road and consolidation of 2 bus zones on Hoppe Street to provide one 63m bus zone. Melrose Park Precinct broader upgrades include Wharf Road Linear shared path, footpaths along all internal roads within Melrose Park North, shared paths along EWR-4, bicycle lanes along EWR-6 various raised pedestrian crossings at intersections within the Melrose Park North Precinct. PLR early works will include an active transport bridge over the Parramatta River to Wentworth Point, providing an essential active and public transport link to the wider Sydney network. Stage 2 will include a separated cycleway along Boronia Street and several intersection upgrades along the PLR route to signalised intersections. Along Waratah Street both footpaths are proposed to be upgraded to provide 2.5 metre wide footpaths.

For cyclists, a minimum of 50 on-site bicycle storage spaces will be provided for students and 8 spaces for staff. MPPS will also provide 2 unisex showers and change rooms for staff, and 10 lockers, as well as 1 unisex shower at the preschool. These provisions are in line with Green Star requirements and would meet future demand levels.

Public transport will not be a significant component of MPPS student travel, due to the small-scale catchment intake area, and the focus will be on walking and cycling instead. Therefore, the proposal does not include any modifications to the existing public transport network. However, for staff, it is expected that there will be an uptake of public transport usage following the development of the Melrose Park Precinct and future PLR Stage 2. As part of the Melrose Park Precinct works, the developers are currently chartering a private shuttle bus during morning and afternoon peak periods to transport residents and employees between Melrose Park and Meadowbank wharf and train station. The frequency of this service is intended to increase to 12 services during peak hours by 2027. It is intended more frequent bus services provided by TfNSW will also be implemented

to facilitate service needs of the growing Melrose Park population, which will provide additional public transport options for staff travelling to / from the site. Additionally, major public transport infrastructure works are being completed as part of the PLR Stage 2, which will directly connect staff travelling to MPPS to the cores of the Eastern and Central CBD's, enhancing accessibility and reducing travel times.

The school will be serviced by a loading dock with capacity for vehicles up to and including a 10.8m waste truck, which will be sufficient for all potential deliveries and service vehicles coming to the site, including waste collection. The loading dock is located within the preschool car park, with controlled access at a secure access point from Mary Street, with intercom facilities. The loading dock is not covered, with no overhead obstructions or height limitations.

Drop-off and pick-up by car ("kiss & ride") will also be catered for at the site, however, is a low priority mode in the sustainable transport hierarchy. Therefore, it will be discouraged and is supplemented by active and public transport options. The proposal includes two zones, one on Mary Street to the south and an extension of the existing zone on Wharf Road to the east. Additionally, the school will provide four accessible kiss & ride bays to provide transport functionality for the Supported Education Learning Unit (SELU) classrooms, which are located on Wharf Road at the northeast corner of the site. These accessible kiss & ride spaces will be designed in accordance with AS 2890.6.

Car parking is the lowest priority travel mode for the project. The proposal will provide a total of 57 on-site parking spaces (including 1 accessible parking space). A maximum of 33 on-site car parking spaces are provided for MPPS, providing a 66% staff provision. It is anticipated the car park will adequately serve all staff demands. The on-site car park will also include 24 car parking spaces for use by the MPHS staff, which is located approximately 200 metres north of MPPS. However, the MPHS development and the adequacy of parking provisions is subject to a separate REF approval. In line with SINSW policy, no car parking will be provided for students or visitors to the site.

Traffic impacts to the surrounding road network have been assessed for the proposed project. The proposed primary school is estimated to generate an additional 268 vehicles (232 students + 36 staff) per peak period. The preschool is estimated to generate an additional 46 vehicles (42 students + 4 staff) per AM peak period, and 28 vehicles (24 students + 4 staff) per PM peak period. As agreed in consultation with Council, the intersection of Wharf Road / Hope Street / Lancaster Avenue has been modelled in SIDRA for the baseline, 2027 'with development' and 2036 'with development' scenarios. The modelling outputs indicate that for all scenarios, the intersection operate well, at a Level of Service B or higher with spare capacity in the intersection. A sensitivity analysis of the impact resulting from the proposed crossings as part of the separate MPHS project has been undertaken, which shows that the intersection continues to perform with a Level of Service B at a satisfactory level with spare capacity.

Overall, the transport provisions of this project across all travel modes have been selected and developed in order to provide a sustainable, safe, and efficient site. These provisions include physical infrastructure works on- and off-site, along with management measures to be implemented during operation of the school. While school sites generate significant volumes of travel demand in short periods of time, the proposed transport strategy is considered an appropriate balance and is demonstrated to provide appropriate outcomes for the site.

Contents

Section 1 Introduction

This Transport and Accessibility Impact Assessment (TAIA) has been prepared to accompany a Review of Environmental Factors (REF) for an activity proposed by the Department of Education (DoE) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI).

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (the Guidelines) by the Department of Planning, Housing and Infrastructure.

This report examines and takes into account the relevant environmental factors in the Guidelines and *Environmental Planning and Assessment Regulations 2021* under Section 170, Section 171 and Section 171A of the EP&A Regulation as outlined in Table 1.

Table 1: Summary of Relevant Section of the Part 5 Guidelines and EP&A Regulation

Regulation / Guideline Section	Requirement	Response	Report Section
a) the environmental impact on the community			
(a1) Impact during construction – such as noise, vibration, traffic, construction vehicle routes, access and parking, pollution/dust, water and stormwater flow, sediment and run-off, waste removal, servicing arrangements, bushfire, flooding, contamination, other construction occurring in the area.	▪ Construction traffic management plan ▪ Traffic and parking study ▪ Transport and accessibility impact assessment ▪ Green Travel Plan	A preliminary Construction Traffic Management Plan (CTMP) has been prepared as part of this REF. This report addresses construction impacts relating to traffic, construction vehicle routes, access and parking.	The separate preliminary CTMP report.
(a2) impact post-construction (including from any development, activity, public-address systems and sirens, signage, events, hours of operation, or out of hours use of facilities, helicopter facilities, emergency facilities) which may include: vi) waste and servicing arrangements (vii) traffic and parking impacts, pedestrian and road safety (including pedestrian and cyclist conflict and safety), operation of the surrounding road network, impact on road capacity, including peak hour, intersection performance and any cumulative impact from surrounding approved developments, impacts of potential queuing in drop-off/pick-up zones and bus bays during peak periods, emergency drop-offs, servicing and loading/unloading areas, large vehicles and height clearances, parking arrangements and rates. Consider in the context of availability, frequency, location and convenience of public transport and consequences of parking overflowing into adjoining streets		This document comprises the TAIA and includes assessment of the post-construction traffic and parking impacts. As well as the preliminary CTMP, a preliminary School Transport Plan (STP) has been prepared as part of this REF, which includes a plan for the safe and efficient operation of the school.	Servicing and waste– Section 8 Parking impacts – Section 10 Pedestrian safety – Section 5 Impact to road network – 10.9 Intersection performance – 10.9 Cumulative impacts – Section 11.5 Drop-off and pick-up – Section 9 Public transport – Section 7 Emergency vehicles – Section 8.1.1 Car parking – Section 10

r) other relevant environmental factors			
(r3) noise/air pollution, vibration and safety impacts from the below on the proposed development: (i) roads with higher traffic volumes, higher operating speeds and more heavy vehicles, freight traffic or used to transport dangerous goods or hazardous materials	▪ Traffic and parking study ▪ Transport and accessibility impact assessment	This TAIA includes assessment of the traffic impacts due to the proposed development.	Traffic impacts – Section 10.9
(r5) suitability and safety of drop-off and pick-up areas, including for emergency vehicles, safety and convenience of proposed parking areas and rates, and off-and-on street parking on school/hospital location, vehicle and pedestrian access, internal vehicle and pedestrian areas, provision of servicing, loading/unloading.		This TAIA includes assessment of all traffic-related elements of the proposal.	Drop-off and pick-up – Section 9 Emergency vehicles – Section 8.1.1 Car parking – Section 10 Site access – Section 5 Service and loading – Section 8

1.1 Scope of Works

This TAIA has been prepared to assess and address the traffic and transport impacts of the proposed development and define the key traffic-related design elements of the proposal.

A preliminary School Transport Plan (STP) and preliminary Construction Traffic Management Plan (CTMP) have been prepared and included as part of this REF. These plans are considered preliminary in nature and would be finalised post-approval as a condition of consent.

1.2 Activity Description

The activity is for upgrades to MPPS within a one to three-storey built form, including:

- Demolition of existing school buildings;
- Site preparation works including tree removal;
- Construction of the following buildings:
  - **Block A**: One (1) storey building comprising:
    - universal pre-school;
    - outdoor play area for the UPS; and
    - detached storeroom;
  - **Block B1**: Two (2) storey building comprising:
    - staff and administration areas;
    - library;
    - 4 special programs rooms;
    - Pedestrian bridge to Block B2;
  - **Block B2:** Three (3) storey building comprising:
    - 23 classrooms;
    - amenities/services cores; and
    - pedestrian bridge to Block B3;
  - **Block B3:** Three (3) storey building comprising:
    - 12 classrooms; and
    - amenities/services cores;
  - **Block C**: One (1) storey building comprising:
    - hall;
    - amenities;
    - canteen;
    - OSHC; and
    - COLA;
- Construction of two (2) car parking areas; and
- Landscaping works.

1.3 Activity Site

MPPS is located at 110 Wharf Road, Melrose Park and is legally known as Lot 3 in DP 535298 with an approximate site area of 2.5 hectares. The site has a frontage to Wharf Road (east), Mary Street (south), and Waratah Street (west). The site is adjoined by a 2-3 storey light industrial development to the north, 1-2 storey industrial and commercial developments to the south, residential dwellings to the east and industrial and commercial development to the west.

An aerial photograph of the site is provided in Figure 1 below.

Figure 1: Aerial Photograph
Source: DFP Planning

1.4 Evaluation of Environmental Impacts

Based on an assessment of the traffic and transport impacts of the proposed upgrades to MPPS, the activity can be adequately mitigated through recommended measures and is not considered to be a significant impact.

1.5 Transport Assessment Basis

For the purposes of the design and assessment of all traffic and transport elements, the future student and staff capacities are the primary inputs and main assessment criteria. Table 2 identifies the existing student and staff population and the proposed maximum student and staff population.

Table 2: Existing and Proposed MPPS Enrolment Capacity

	Existing Capacity		Proposed Maximum capacity	
MPPS	**Students**	**Staff**	**Students**	**Staff**
Main School	185	22	705	44
Support Unit	0	0	15	6
Total	**185**	**22**	**720**	**50**
Net Additional	**-**	**-**	**+535**	**+28**

As shown in Table 2, the existing school currently accommodates 185 students and 22 staff. The principal confirmed the school is currently operating at full capacity in 2025. The proposed school will accommodate a maximum capacity of 720 students and 50 staff, this is an increase of 535 students and 28 staff when compared with existing conditions. It is noteworthy to mention, it is not intended maximum capacity numbers will be achieved on day 1, but rather a progressive growth depending on student demand.

The proposed development will also incorporate a new public preschool on the site. Table 3 provides details of the proposed preschool student and staff population.

Table 3: Proposed Preschool Enrolment Capacity

	Students	Staff
Preschool	60	5

As shown in Table 3, the proposed preschool will accommodate a maximum capacity of 60 students and 5 staff.

1.6 School Catchment

The proposed school catchment boundary is intended to reduce in size to accommodate the future residential growth in Melrose Park Precinct only. The proposed catchment area has an approximate radius of 800m, meaning all students will live within a 10-minute walk of the school site. The existing and proposed catchment boundaries are detailed below in in Figure 2.

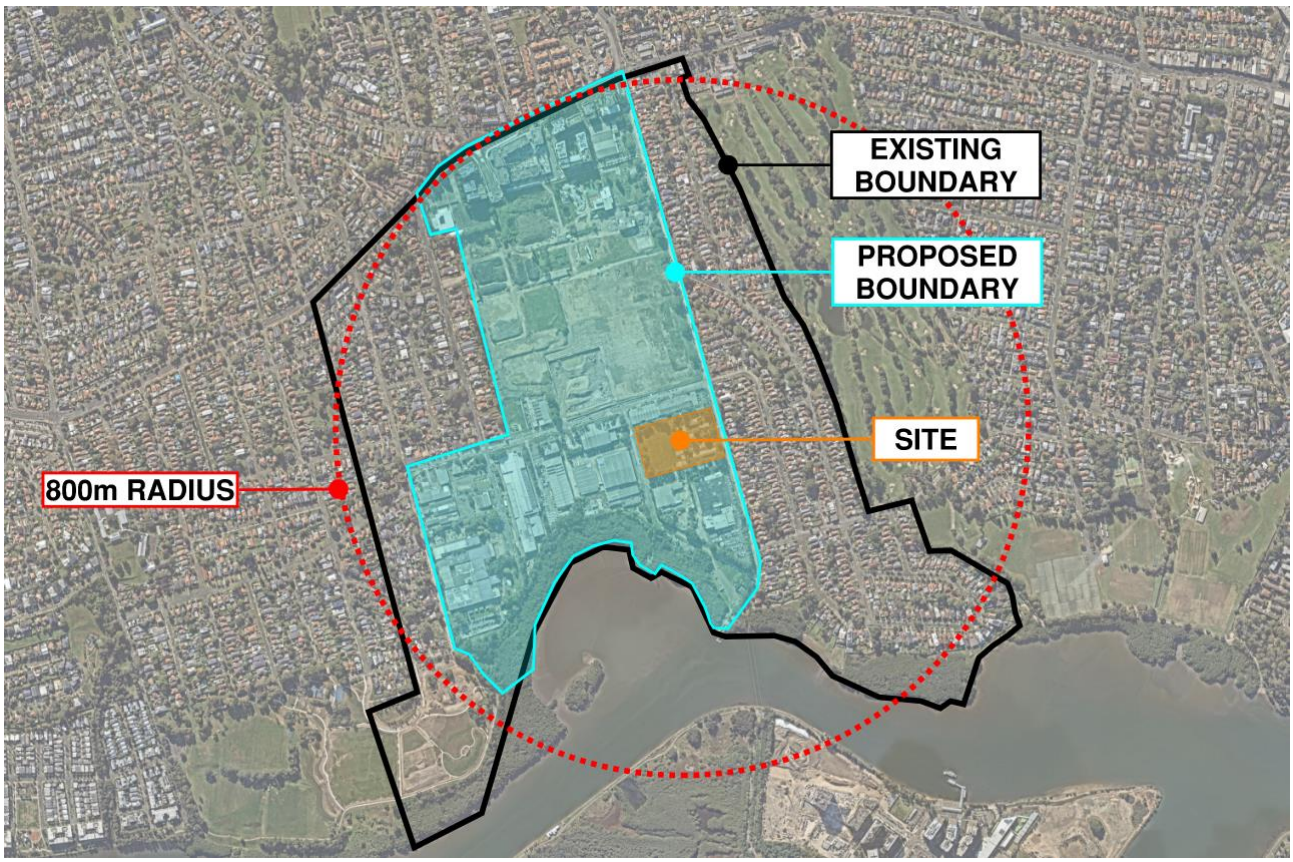


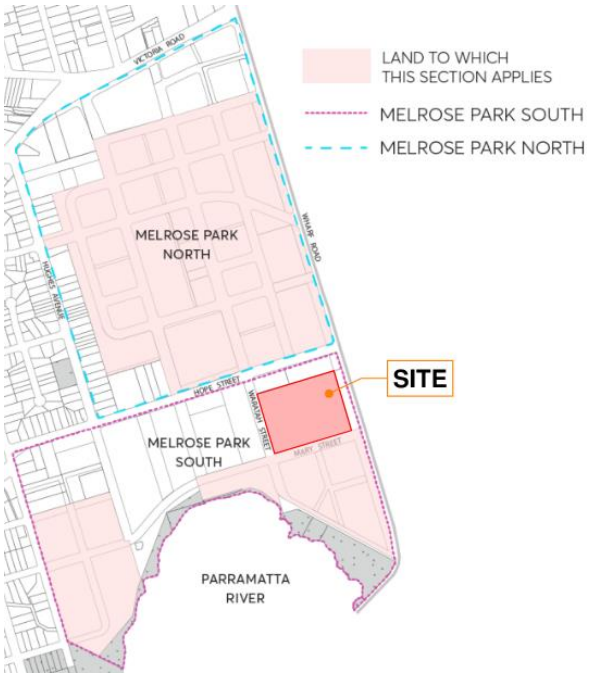
Figure 2: Proposed School Catchment Boundary
Source: Modified from Nearmap

1.7 Strategic Planning Context

1.7.1 Environmental Planning Instruments

Table 4 outlines the relevant environmental planning instruments related to the traffic and transport assessment of the activity.

Table 4: Relevant Environmental Planning Instruments

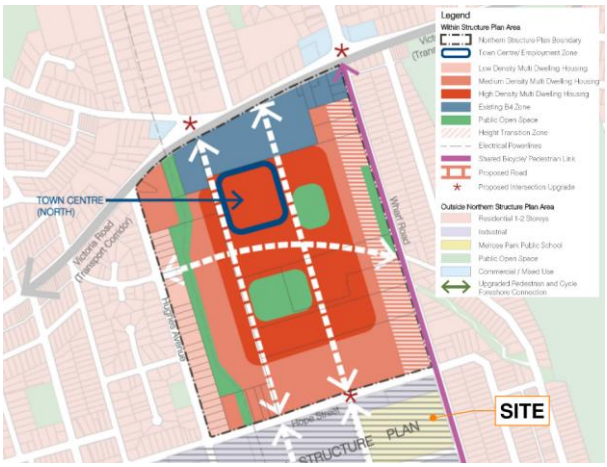
Document	Comment
Parramatta Local Environmental Plan 2023	This legal document applies to land within the City of Parramatta Local Government Area (LGA) and provides the framework for planning in the LGA. It contains development standards and is referred to as 'Parramatta LEP' within this report.
Parramatta Development Control Plan 2023	This document is to supplement the Parramatta LEP 2023 and provide more detailed provisions to guide development. This document general controls and design guidelines for all developments within the City of Parramatta LGA and is referred to within this report as 'Parramatta DCP'.
Parramatta DCP 2023 – Part 8 Centres, Precincts, Special Character Areas & Specific Sites	Within the Parramatta DCP, Part 8.2.6 Melrose Park Urban Renewal Precinct relates specifically to development on the land in Melrose Park shown in the Figure 3 below. This document is referred to within this report as 'Parramatta DCP, Part 8.2.6 Melrose Park Precinct'. The Melrose Park Precinct is being developed on rezoned industrial land between Victoria Road and the Parramatta River. The majority of land within the north precinct has been rezoned, where the south precinct is still predominantly zoned as general industrial land. The Melrose Park Precinct is guided by the Melrose Park Structure Plans, which are discussed in Section 1.7.2  **Figure 3: Melrose Park Precinct** *Source: Parramatta DCP 2023*
Draft Parramatta Bike Plan 2023	The draft Parramatta Bike Plan outlines the vision to continue advocating, planning and delivering both infrastructure and programs to support riding in the City of Parramatta LGA.

Document	Comment
Greater Sydney Commission's Central City District Plan	Greater Sydney Commission is implementing the Region Plan through five district plans, which detail district-specific directions, place-based outcomes, and the actions to achieve these. The Central City District Plan (CCDP) covers MPPS and nominates Greater Parramatta, Blacktown, Castle Hill, Rouse Hill and Merrylands as strategic centres. The CCDP describes how integrated land use and transport planning can help achieve the 30-minute city by encouraging the growth of strategic and local centres to reduce the need for people to travel long distances to access jobs, education and services. The school development is consistent with the vision outlined in the Greater Sydney Commission's CCDP, as it would provide much-needed school infrastructure conveniently located near existing public transport services and opportunities to co-share facilities with the local community.
Future Transport Strategy	The Future Transport Strategy sets the strategic direction for Transport for NSW (TfNSW) to achieve world-leading mobility for customers, communities, businesses, and our people. It is part of a suite of government strategies, policies and plans that integrate and guide land use and transport planning across NSW. It replaces *Future Transport 2056: Shaping the Future*, which was published in 2018. The Future Transport Strategy was developed in collaboration with other government agencies to ensure the State's overarching strategies align and complement each other. TfNSW used a 'vision and validate' approach for the Future Transport Strategy. This approach starts with a long-term vision and establishes the outcomes we need to deliver that vision for customers and communities. The Future Transport Strategy will provide the direction for TfNSW based on three outcomes that form this strategy: ▪ Connecting our customers' whole lives ▪ Successful places for communities ▪ Enabling economic activity. The Future Transport Strategy considers every part of NSW transport system from planning to operations to ensure a fully integrated approach. It sets the direction for localised plans and strategies, policy direction and prioritisation.

1.7.2 Melrose Park Precinct Planning Documents

The Melrose Park Precinct is located within the Parramatta LGA, approximately 7km to the east of the Parramatta Central Business District (CBD). The precinct is made up of two sub-precincts, Melrose Park North and Melrose Park South as shown in Figure 3. The planning documents and development plans within the Melrose Park Precinct that are relevant to this traffic and transport assessment are shown in Table 5.

Table 5: Melrose Park Precinct Planning Documents

Document	Comment
Melrose Park Northern Structure Plan 2016	The Melrose Park Structure Plans guide the precinct's urban renewal, ensuring a coordinated approach to redevelopment by CoP, landowners, and State agencies. The Structure Plans provide an overview of where density and supporting infrastructure should be located. In December 2016, CoP adopted the Northern Structure Plan as shown in Figure 4.  **Figure 4: Melrose Park Northern Structure Plan** *Source: City of Parramatta Council (2016)*
Melrose Park Southern Structure Plan 2019	In December 2019, CoP adopted the Southern Structure Plan as shown in Figure 5.  **Figure 5: Melrose Park Southern Structure Plan** *Source: City of Parramatta Council (2019)*

Document	Comment

Melrose Park Transport Management and Accessibility Plan	The Melrose Park Transport Management and Accessibility Plan (TMAP) was prepared in 2019 by Jacobs for the entire Melrose Park Precinct (both north and south precincts).
	
	The purpose of the TMAP was to assess at a masterplan level the traffic and transport implications of the proposed development of approximately 11,000 dwellings. The assessment was tailored specifically to address stakeholder comments through the Project Coordination Group (PCG) consisting of CoP, TfNSW, Department of Planning & Environment (DPE) and Parramatta Light Rail (PLR). The TMAP provided a framework for the implementation of a range of measures designed to achieve a sustainable transport outcome for the Melrose Park structure plan.
	
	The assessment process included analysis focused around achieving the targets defined with the PCG of encouraging more people to use public transport (40%) and reduction of private vehicles (50%) over the next 20 years. Initiatives to increase public transport use have guided the planning process for the Melrose Park structure plan and are fundamental to the development of the precinct.
	
	The TMAP also includes an in-depth analysis of the projected traffic generation for the Melrose Park Precinct. Detailed Aimsun traffic modelling was conducted during the TMAP's development to assess the performance of the surrounding road network at full development (2036), including the need for road infrastructure improvements (intersection upgrades and road widening), public transport improvements and other traffic-related upgrades necessary to support the forecast growth. Details of the proposed staging and trigger points for major infrastructure and services include:
	
	▪ **Stage 1A: Delivered at approximately 1,100 total dwellings (2021)**
	  ▪ Widening of Wharf Road south of Victoria Road
	  ▪ Left in/left out access from Victoria Road to NSR-2 (i.e. at Kissing Point Road)
	▪ **Stage 1B: Delivered at approx. 1,800 total dwellings (2022)**
	  ▪ Upgrade of Vitoria Road/Wharf Road intersection to provide:
	  ▪ Additional dedicated left turn lane on eastern Victoria Road approach
	  ▪ 4 lanes on Wharf Road approach - 1 left, 1 through, 2 right
	  ▪ Removal of slip lane on western Victoria Road approach and realignment of stopline to allow for more efficient ‘diamond’ signal phasing
	  ▪ Additional through lane on Marsden Road approach
	▪ **Stage 1C: Delivered at approx. 3,200 total dwellings (2024)**
	  ▪ Upgrade of the Victoria Road/Kissing Point Road intersection
	  ▪ Fully signalised intersection allowing all turning movements
	  ▪ New signalised pedestrian crossings on the northern, southern and western intersection legs

Document	Comment

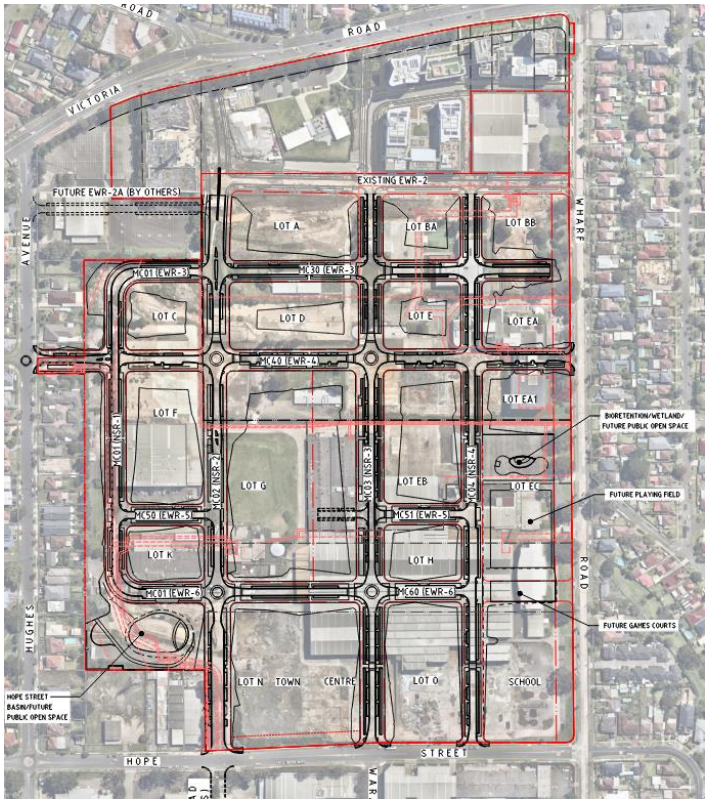
Melrose Park Transport Management and Accessibility Plan	▪ **Throughout Stage 1**
	  ▪ Provide shuttle buses to service the public transport demand from Melrose Park to Meadowbank station. Provision of this service will commence with one shuttle bus, with further shuttles to be brought into service in line with delivery of dwellings with a total of 4 buses providing an ultimate Stage 1 frequency of 12 shuttles per hour in the peak periods.
	  ▪ Staged improvements to frequency of M52 bus services on Victoria Road as to provide ultimate frequency of 18 per hour in peak direction. (Noting that Melrose Park demand accounts for 5 of the additional 12 hourly services)
	  ▪ Staged delivery of internal road network and associated pedestrian and cycling infrastructure to provide access to development
	▪ **Stage 2: Delivered at approximately 6,700 total dwellings (2028)**
	  ▪ New public transport and active transport bridge over the Parramatta River between Melrose Park and Wentworth Point. The bridge will be designed to cater for both bus and light rail vehicles.
	  ▪ Public transport services as described in section 6.4.6 of the TMAP, including maintaining Stage 1 M52 service improvements and also providing services over the new bridge either via PLR Stage 2 or high frequency bus connections.
	  ▪ Staged delivery of internal road network and associated pedestrian and cycling infrastructure to provide access to development.
	Figure 6 provides an overview of the road infrastructure upgrades detailed in the TMAP.
	 
	Figure 6: Victoria Road Upgrades Identified in TMAP
	Source: Melrose Park TMAP (Jacobs, 2019)

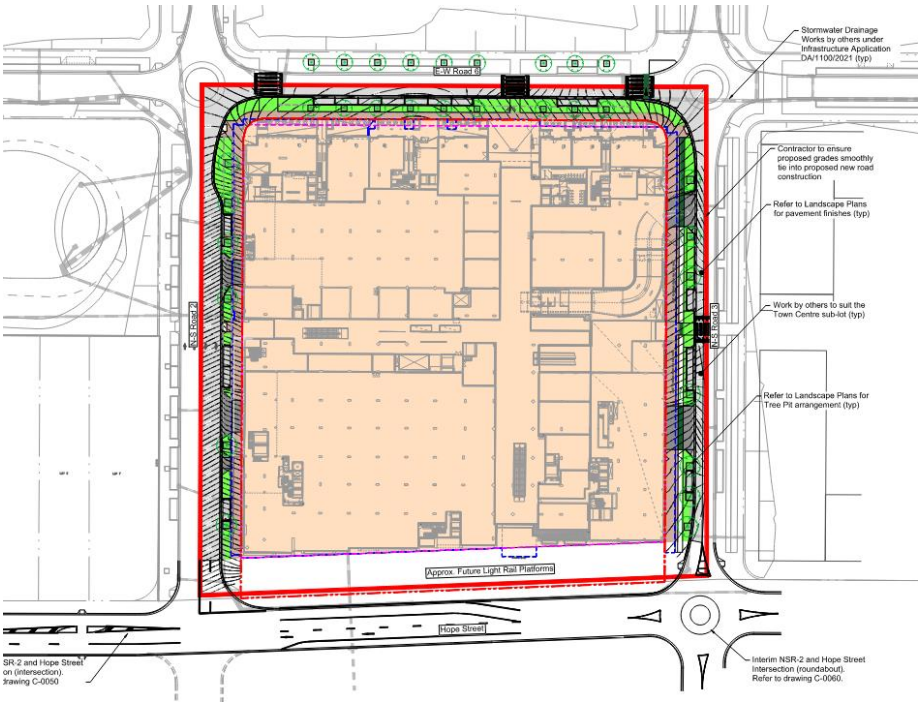
Document	Comment
Melrose Park Transport Management and Accessibility Plan	The key conclusions of the TMAP are: ▪ The additional traffic demands as a result of Melrose Park development on the surrounding local road network fall within acceptable capacity thresholds ▪ A new active and public transport bridge across Parramatta River will provide substantial connectivity improvements between Melrose Park, Rhodes and Sydney Olympic Park before light rail is implemented ▪ PLR Stage 2 would provide a direct link to the Parramatta CBD, and connect to Sydney CBD via the broader rail and metro networks ▪ The TMAP recommends a total off-street parking supply of 9,441. A total on-street parking supply of approximately 700 and 500 spaces is being proposed for the northern and southern precincts respectively. It is proposed to initially provide levels of parking in accordance with Parramatta DCP, and gradually decrease parking provision as the public transport initiatives are implemented The TMAP has been endorsed by TfNSW and is required to be used as the supporting technical document within the precinct. Therefore, the assessment of traffic implications of MPPS specifically references the TMAP and align with the overarching objectives.

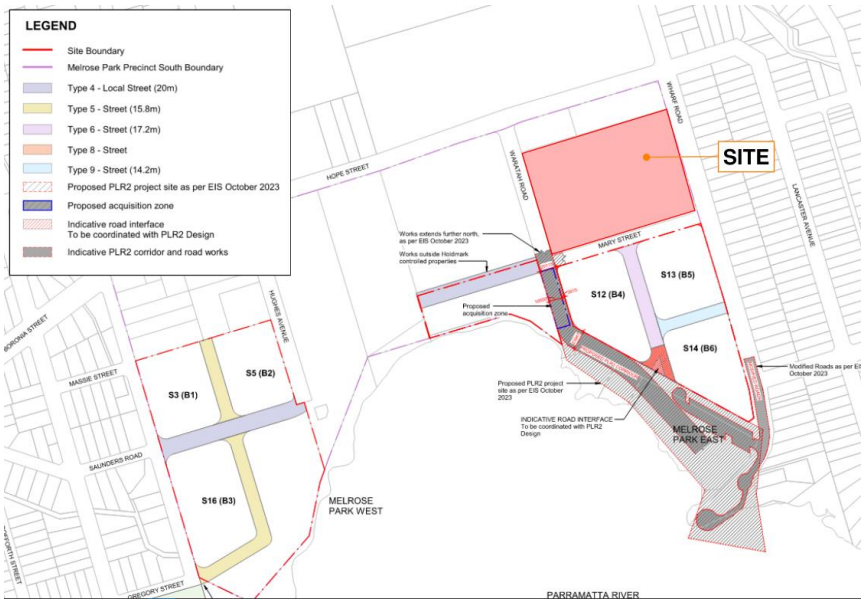
1.7.3 Melrose Park Precinct Development Plans

Redevelopment of the Northern Precinct is more advanced than the Southern Precinct, due to landowner arrangements. Approximately 85% of the land in the Northern Precinct, is owned by the developers Sekisui. The major landowner in the Southern Precinct is Holdmark, who own just under 50% of the land. The relevant development applications (DA) within the Melrose Park Precinct are summarised in Table 6.

Table 6: Melrose Park Precinct Relevant Development Plans

Document	Comment
Melrose Park North Internal Street Network (DA/1100/2021)	Following Planning Proposal approval (PP-2020-1983) a DA for the Melrose Park North street network (DA 1100/2021), including roads, footways, street trees, landscaping, drainage, services and associated infrastructure was approved in December 2023, with construction works currently underway at the time of writing. The approved civil engineering general arrangement plan is shown in Figure 7. Notably, the works include: ▪ New road (NSR-4) in the north-south direction to the west side of the proposed Melrose Park High School (MPHS) site boundary ▪ Raised zebra crossing on NSR-4 ▪ 2 metre footpaths on both sides of NSR-4 ▪ Upgrade of Hope Street / Waratah Street / NSR-3 intersection to a roundabout  **Figure 7: Melrose Park Infrastructure Works** *Source: DA Civil Engineering Package (Northrop, 2023)*

Document	Comment
Melrose Park Town Centre (DA/764/2022)	A separate DA was also approved for the Melrose Park Town Centre (DA/764/2022), including a 5-storey commercial podium and 6 x 6-24 storey shop-top housing towers (consisting also of retail, business, office, medical centre, childcare and an indoor recreation facility), 494 residential apartments, 1,412 car parking spaces and public domain works. This DA was approved in December 2023, with construction works currently underway at the time of writing. The approved civil engineering general arrangement plan is shown in Figure 8.  **Figure 8: Melrose Park Town Centre** *Source: DA Stamped Civil Plans (Mott Macdonald, 2023)*

Document	Comment
Part Melrose Park South Street Network (DA/75/2024)	Following Planning Proposal approval (PP-2020-4038), this DA is for part of the Melrose Park South street network, including roads, footways, street trees, landscaping, drainage, services, and associated infrastructure. This DA was lodged in February 2024 and is currently under assessment by CoP at the time of writing. The concept roads and lots plan are shown in Figure 9.  **Figure 9: Melrose Park South (Holdmark Sites) Concept Drawing** *Source: DA Concept Plan (COX, 2023)*

1.8 Codes, Standards & References

The traffic and transport strategy for the activity has been prepared in the context of a variety of relevant codes, standards, and references listed below:

- Parramatta Development Control Plan 2023 (Parramatta DCP)
- Parramatta Local Environmental Plan 2023 (Parramatta LEP)
- Melrose Park Transport Management and Accessibility Plan Final Report Jacobs, 2019 (TMAP)
- Traffic Report for Melrose Park North Internal Street Network, Pentelic Advisory, 2022 DA 1100/2021 (Melrose Park North Internal Street Network, Traffic Report)
- Melrose Park Town Centre Transport Assessment JMT Consulting, 2023 DA 764/2022 (Town Centre, Traffic Report)
- Transport Assessment Holdmark Sites, Melrose Park South Planning Proposal, Ason Group, 2022 (Melrose Park South PP TA)
- Melrose Park South – Infrastructure DA Preliminary Construction Traffic Management Plan TTPP, 2023 (Melrose Park South Infrastructure CTMP)
- Melrose Park High School – Transport and Accessibility Impact Assessment (MPHS TAIA), TTW, 2025
- Parramatta Light Rail Stage 2 Environmental Impact Statement, Chapter 9, 2022 (PLR2 EIS)
- Technical Paper 2 Transport and Traffic, Parramatta Light Rail Stage 2 Environmental Impact Statement GHD, 2022 (PLR2 EIS, Transport and Traffic)
- Australian Standards, including:
  - AS2890 – Parking facilities
  - AS1742 – Manual of uniform traffic control devices
  - AS1428 – Design for access and mobility
- Austroads Guidelines, including:
  - Guide to Traffic Management
  - Guide to Road Design
  - Guide to Road Safety
- Guide to Transport Impact Assessment (GTIA)
- NSW Planning Guidelines for Walking and Cycling
- Educational Facilities Standards and Guidelines (EFSG)
- Greenstar Building Guidelines, V1 Rev B 2021 (Greenstar Building Guidelines)

1.9 Consultation

This report has been prepared following consultation between the design team and relevant stakeholders, including CoP, City of Ryde Council (CoR) and TfNSW. Consultation events and outcomes are identified in Table 7.

Table 7: Consultation Summary

Date	Attendees	Discussions	Outcomes
13 Nov 2024	Transport Working Group (CoP & TfNSW)	▪ A teleconference meeting was held with representatives from CoP and TfNSW. ▪ The project's general transport strategy and strategic context was introduced. The meeting discussed key transport considerations for the project, and transport infrastructure upgrade opportunities. ▪ In terms of road network, CoP confirmed the full Mary Street east-west connection is not yet part of the Holdmark sites redevelopment. CoP also noted that the proposed Mary Street / Waratah Street intersection falls within the PLR Stage 2 Enabling Works. TfNSW to reach out to PLR team to find out detail on proposed intersection design. CoP also noted the roundabout upgrade at Waratah Street / Hope Street is expected to be completed prior to MPPS opening.\ ▪ TfNSW mentioned the draft TfNSW guide indicating that bike parking at schools should be provided for 20% of students. ▪ CoP recommended that the 'reach' scenario should show more ambitious walking and cycling target mode splits. ▪ CoP noted that they are requesting the Holdmark sites developer to build crossings on Mary St at the mid-block and near the Wharf Road intersection.	▪ The project is to set aside spatial provisions for installation of up to 20% bicycle mode share if met in the future. ▪ The mode share targets have been refined so that the 'reach' scenario is more ambitious and increases walking and cycling modes. ▪ Coordination between the project team and CoP has occurred regarding CoP's request for the Holdmark sites developer to build crossings and footpaths on Mary Street.

Date	Attendees	Discussions	Outcomes
19 Dec 2024	CoP	▪ Email and phone call discussions between CoP and TTW occurred regarding traffic modelling and scope of investigations. ▪ CoP noted that relying on the recently approved DA for the Melrose Park North Internal Street Network (Pentelic Advisory, 2022) is insufficient, as the baseline traffic volumes for Hope Street were significantly underestimated. ▪ CoP advised that the only intersection that Council is concerned about is Hope Street / Wharf Road / Lancaster Avenue, where Council believes this should be upgraded to a roundabout.	▪ New traffic volume counts have not been undertaken, as the Melrose Park North Internal Street Network DA traffic report has already been approved by Council. ▪ TTW has modelled the intersection at Hope Street / Wharf Road / Lancaster Avenue for the following scenarios: ▪ Baseline ▪ 2027 + development ▪ 2036 + development
13 Feb 2025	CoP	▪ Following the TWG meeting, TTW shared the proposed entry point locations to Council for coordination with the Holdmark sites developer regarding pedestrian crossing locations	▪ Council responded that the Holdmark sites DA has not been approved yet so there is no confirmation on the scope of works by the Holdmark developer at this stage. However, Council is in discussions with the developer regarding public domain scope along Mary Street

Section 2 Existing Conditions

2.1 Site Overview

The site is located at 110 Wharf Road, Melrose Park within the Parramatta LGA, approximately 8km east of the Parramatta CBD. The school covers an approximate area of 2.5 hectares and is generally rectangular in shape. The site is currently operating with approximately 185 students and 22 staff, the principal confirmed the school is currently operating at full capacity in 2025. The site also has an existing on-site car park providing 12 dedicated staff parking spaces, with vehicle access via Mary Street.

The site is bordered by Wharf Road along the eastern boundary, Mary Street along the southern boundary and Waratah Street along the western boundary. The northern boundary currently borders a commercial / industrial development. MPHS is a proposed new high school, located at 84 Wharf Road, to the north of the site, this project is subject to a separate REF application.

An aerial view of the site and the surrounding road network is shown in Figure 10.

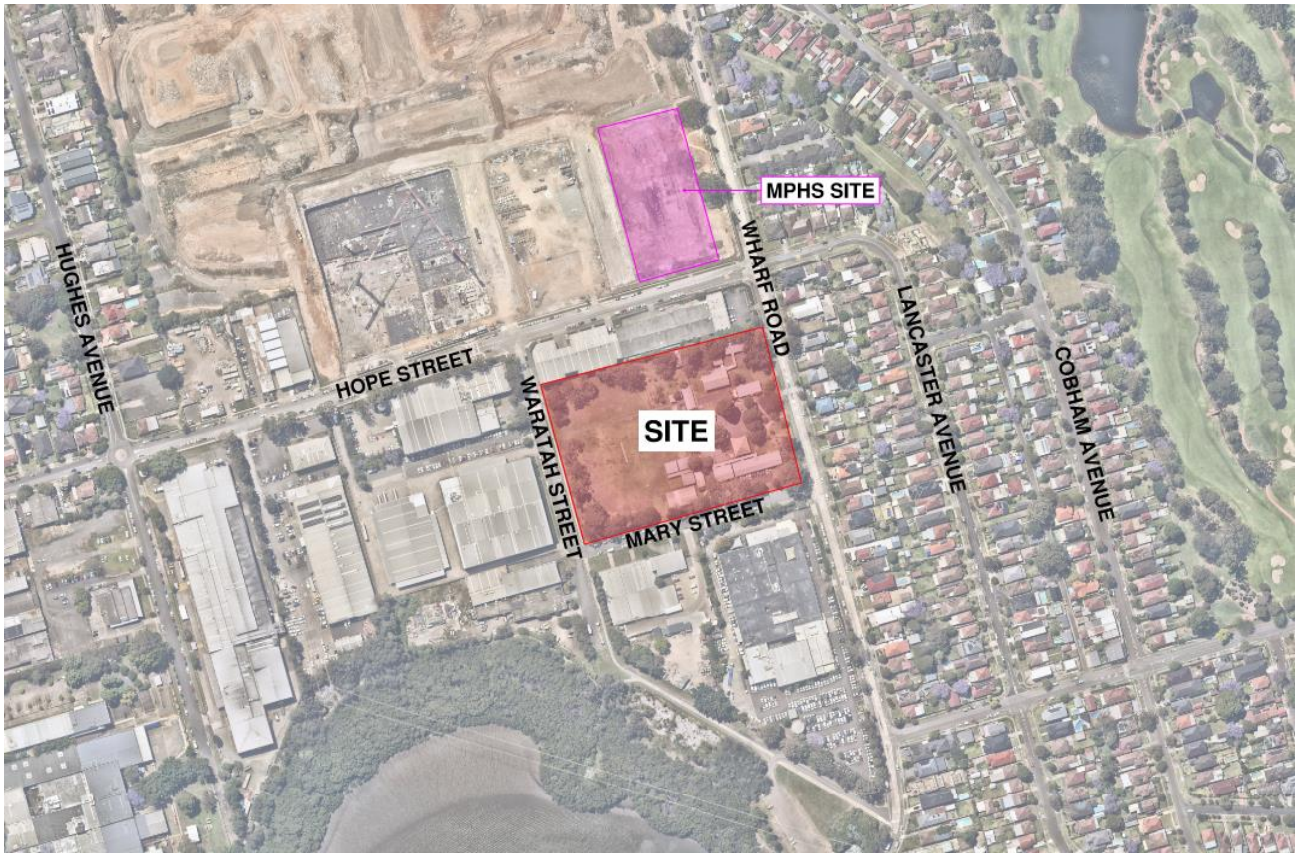


Figure 10: Site Location
Source: Modified from Nearmap

2.2 School Catchment

To understand where students currently live within the existing school catchment, existing student location data has been provided by SINSW. By incorporating the existing road network within the school catchment and the student location from SINSW, the analysis was able to estimate student's distance to / from the school, which can determine the existing travel modes to / from the school.

Figure 11 shows the actual walking distances (colour coded) and notional (straight line) distances from the site within the school catchment. Table 8 has then extracted the student location data to confirm existing student locations within the school catchment.

Figure 11: Existing Walking Distance Analysis
Source: TTW

Table 8: Existing Student Location Analysis

Source: TTW

Distance Bracket	Actual Walking Distance		Notional Distance	
	%	#	%	#
0 – 400m	7%	12	19%	35
401 – 800m	33%	61	42%	77
801 – 1200m	23%	43	8%	16
1201m – 1600m	7%	12	10%	18
1601 – 2300m	15%	27	11%	21
> 2300m	16%	29	10%	19
Total	**100%**	**185**	**100%**	**185**

As shown by the existing student location breakdown in Table 8, existing students typically live relatively close to the site, with approximately 63% (116 students) of existing students live within a 1,200m walking distance (or 15-minute walk) to the school. The remaining 37% (68 students) live outside 1,200m walking distance which would typically be considered too far for primary school students to walk. Existing travel mode surveys have been completed and are included in Section 2.8.1 to understand existing student travel habits.

This assessment assists with understanding existing student locations and travel patterns, however it is important to highlight as part of this proposal the existing school catchment boundary will reduce in size and an updated student location analysis has been completed in Section 4.2.

2.3 Road Hierarchy

2.3.1 Existing Road Network

The key existing roads in the local network are described in Table 9 and Figure 12.

Table 9: Existing Road Network

Road Name	Classification	Speed Limit	Road Geometry	Parking Restrictions
Victoria Road	State Road	70km/hr	▪ Three lanes in each direction ▪ 18m divided carriageway	No parking
Wharf Road	Local Road	50km/hr School Zone 40km/hr 8-9:30am 2:30-4pm School Days	▪ One lane in each direction ▪ Kerbside parking on both sides ▪ 12.3m undivided carriageway	Unrestricted parking & western kerbside of Wharf Road at MPPS 'No Parking' 8-9:30am 2:30-4pm School days
Hope Street	Local Road	50km/hr School Zone 40km/hr 8-9:30am 2:30-4pm School Days	▪ One lane in each direction ▪ Kerbside parking on both sides ▪ 12.5m undivided carriageway	Unrestricted parking
Lancaster Avenue	Local Road	50km/hr	▪ One lane in each direction ▪ Kerbside parking on both sides ▪ 9m undivided carriageway	Unrestricted parking
Waratah Street	Local Road	50km/hr School Zone 40km/hr 8-9:30am 2:30-4pm School Days	▪ One lane in each direction ▪ Kerbside parking on both sides ▪ 11m undivided carriageway	Unrestricted parking & eastern kerbside at MPPS 'P15 8-9:30am 2:30-4pm' School days
Mary Street	Local Road	School Zone 40km/hr 8-9:30am 2:30-4pm School Days	▪ One lane in each direction ▪ Kerbside parking on both sides ▪ 10m undivided carriageway	Unrestricted parking & northern kerbside at MPPS 'P15 8-9:30am 2:30-4pm' School days

Table 9 provides a general summary of the state and local road network, including parking restrictions on each of the above roads. Further details of on-street parking restrictions are provided in Figure 28.

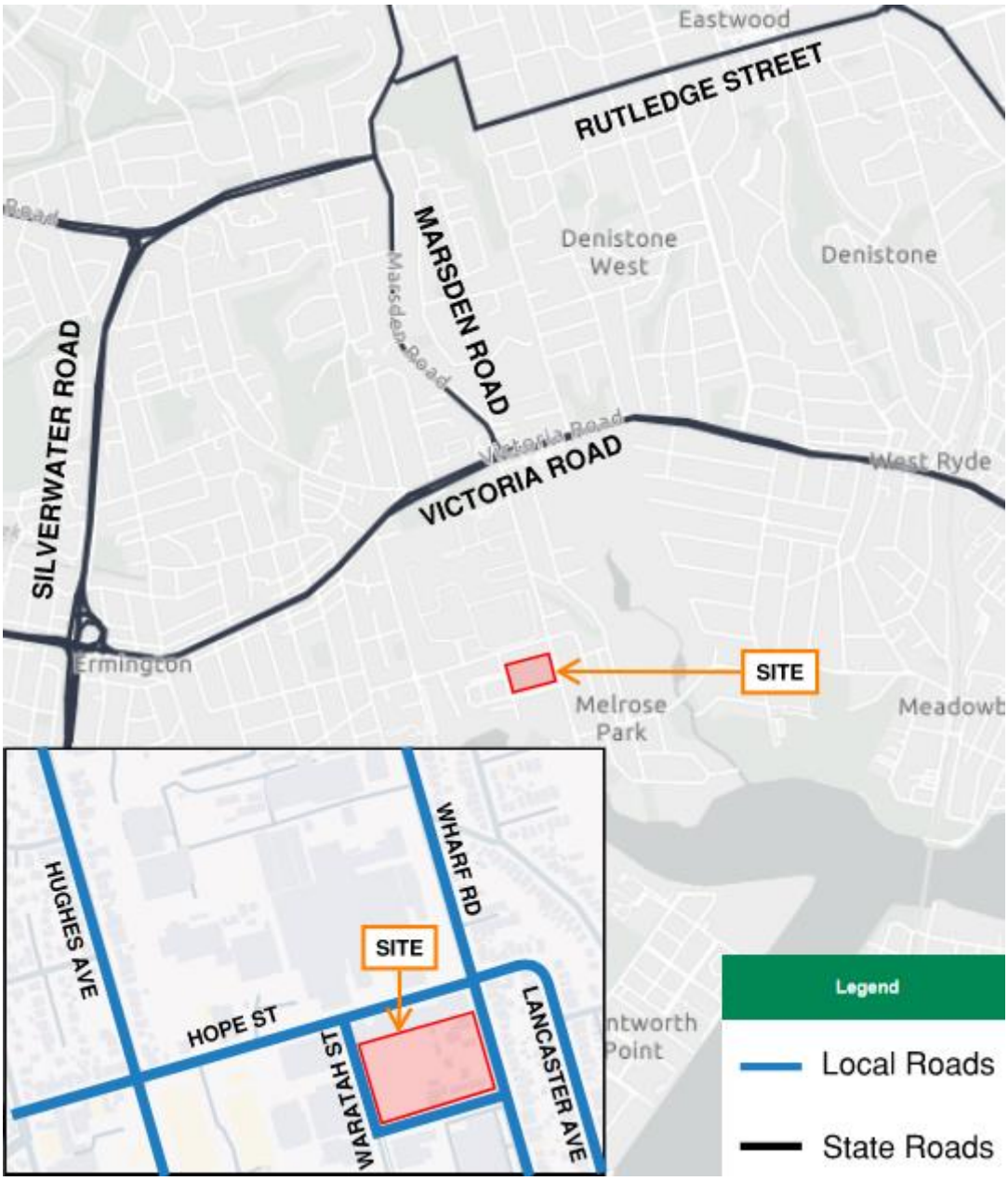


Figure 12: Existing Road Classification
Source: Modified from NSW Road Network Classification

2.3.2 Melrose Park North Future Road Network

As previously mentioned, the road network for Melrose Park North is currently under construction (at the time of writing). These roads will be completed as part of the Voluntary Planning Agreement (VPA) once the subdivisions have been created. The details of the future road network in Melrose Park North have been extracted from the Melrose Park North Internal Street Network, Traffic Report (DA 1100/2021) and Melrose Park Street Type Cross Sections from Parramatta DCP Part 8. Details are summarised in Table 10 and Figure 13.

Table 10: Future Melrose Park North Road Network

Road Name	Classification	Road Geometry
NSR-1	Local Street	▪ One travel lane in each direction ▪ Indented on-street parking bays on both sides ▪ 11.6m undivided carriageway ▪ 2.0m footpath on both sides
NSR-2	Major Road	▪ Two travel lanes in each direction ▪ Indented on-street parking bays both sides ▪ 3.5m wide footpaths on both sides ▪ 12.8m undivided carriageway
NSR-3	Main Road	▪ One travel lane in each direction ▪ Indented on-street parking bays on both sides ▪ 11.0m undivided carriageway ▪ One separated cycle lane in each direction ▪ 1.8m-2m footpath on both sides
NSR-4	Local Street	▪ One travel lane in each direction ▪ Indented on-street parking bays on both sides ▪ 11.6m undivided carriageway ▪ 2.0m footpaths on both sides
EWR-3	Local Street	▪ One travel lane in each direction ▪ Indented on-street parking bays on both sides ▪ 11.6m undivided carriageway ▪ 2.0m footpath on both sides
EWR-4	Connector Road	▪ One travel lane in each direction ▪ Indented on-street parking bays on both sides ▪ 11 m undivided carriageway ▪ 3.0m footpath on the north side, 2.0m footpath on the south
EWR-5	Local Street	▪ One travel lane in each direction ▪ Indented on-street parking bays on both sides ▪ 11.6m undivided carriageway ▪ 2.0m footpath on both sides
EWR-6	Local Street	▪ One travel lane in each direction ▪ Indented on-street parking bays on both sides ▪ 11.6m undivided carriageway ▪ 2.0m footpath on both sides

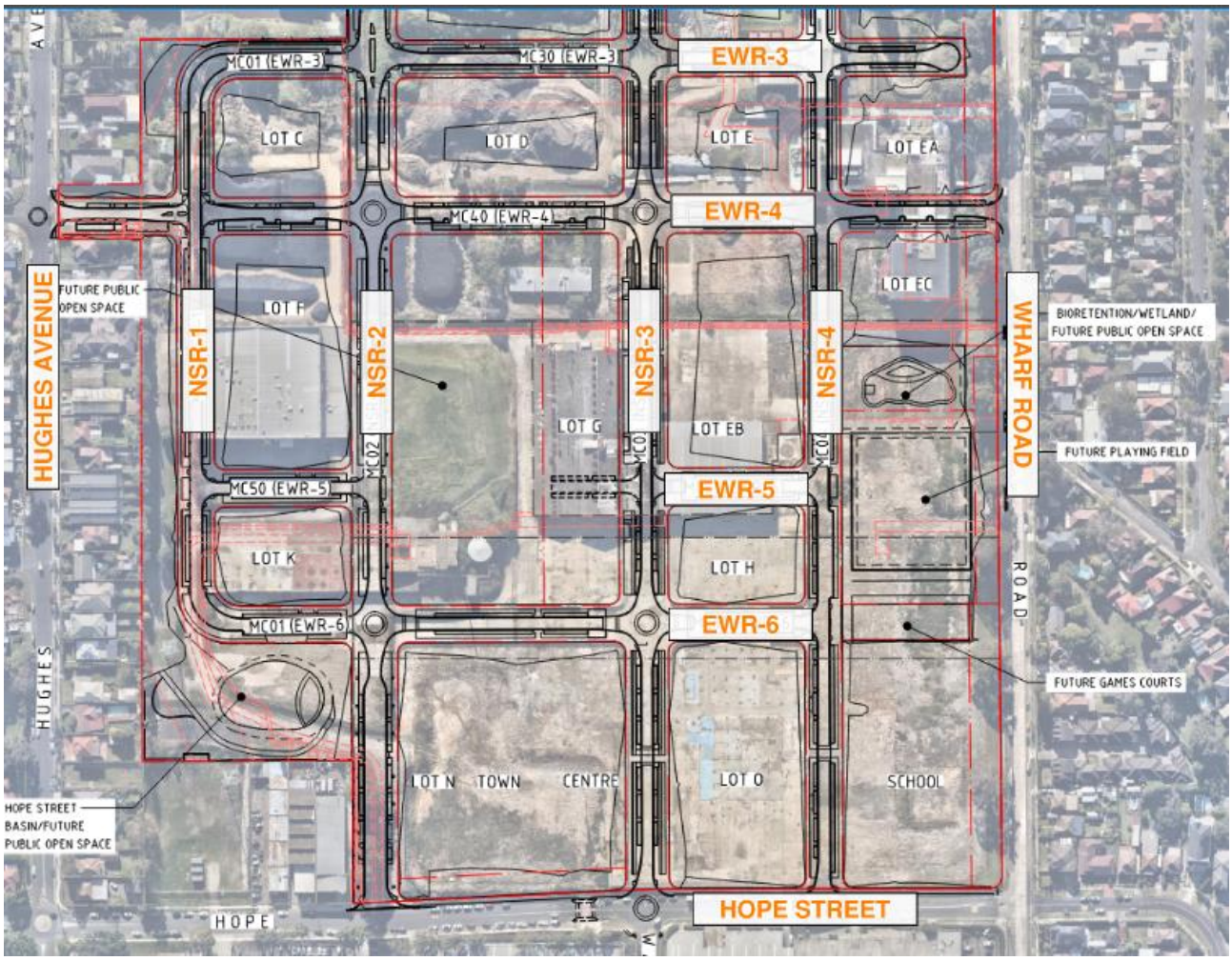


Figure 13: Melrose Park North Road Network

Source: Modified from DA Civil Engineering Package (Northrop, 2023)

2.3.3 Melrose Park South Future Road Network

The DA for the Melrose Park South street network (DA/75/2024) is currently under assessment by CoP at the time of writing. Of note, this includes:

- 17.2m street in the north-south direction to the south side of MPPS
- 20m local street in the east-west direction, extending the existing Mary Street to the south of MPPS
- 20m local street and 15.8m streets in the western portion of the Holdmark sites

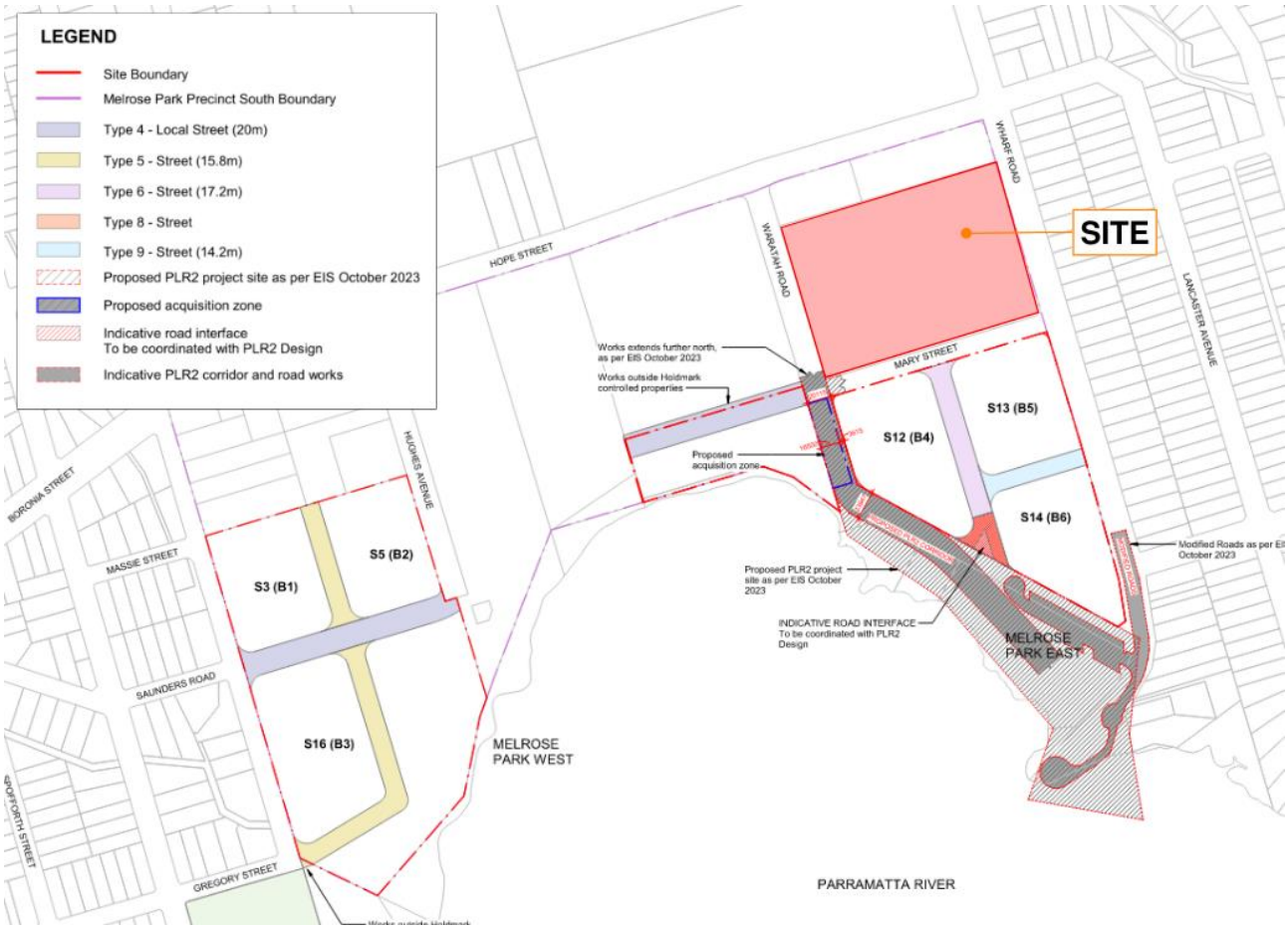


Figure 14: Melrose Park South (Holdmark Sites) Concept Drawings
Source: DA Concept Plan (COX, 2023)

2.4 Active Transport

2.4.1 Existing Active Transport Infrastructure

As shown in Figure 15, the existing pedestrian infrastructure within a 400-metre radius of the site (approximately a 5-minute walk) is generally well-developed along the existing road network. Footpaths are provided along all roads, with widths varying between 1.5 and 2 metres, offering ample space for pedestrian movement. There are also existing zebra crossings and refuge islands in the vicinity of the site.

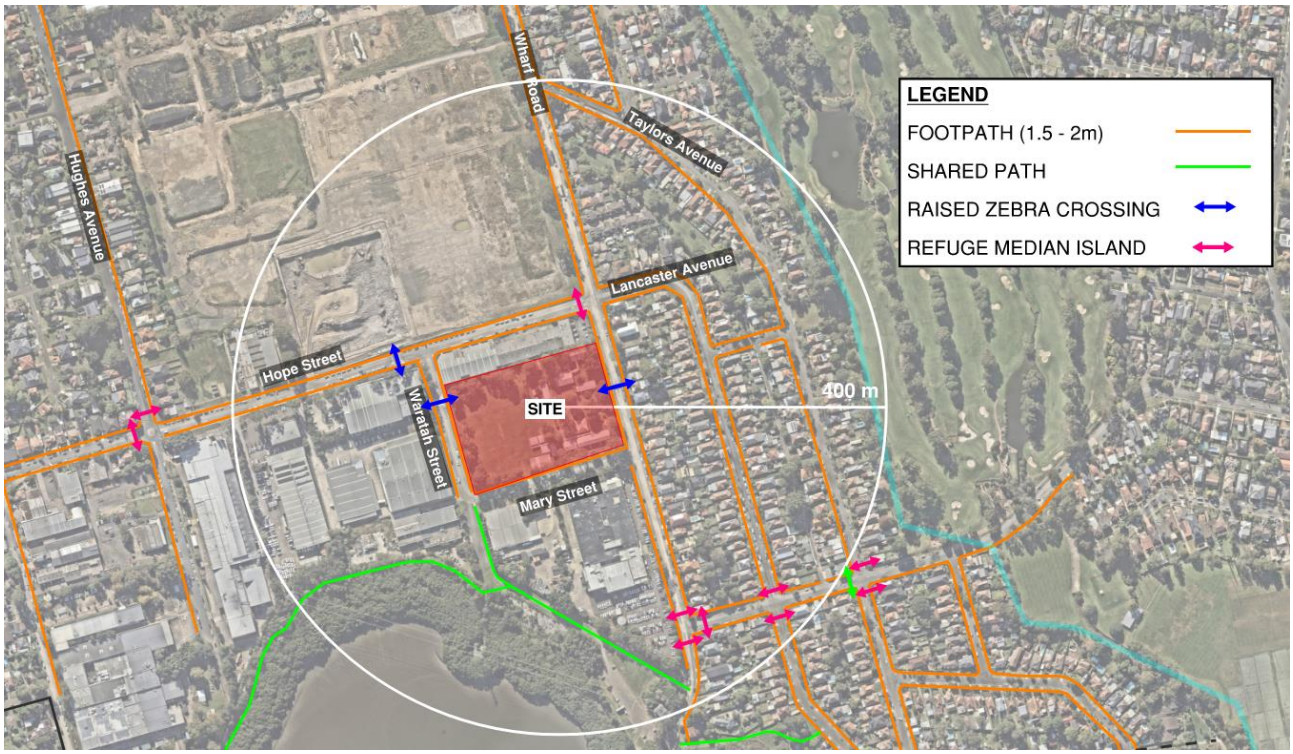


Figure 15: Existing Active Transport Infrastructure
Source: Modified from Nearmap

2.4.2 Future Active Transport Infrastructure

Melrose Park North

As previously mentioned, the Melrose Park Precinct is currently undergoing development. As a result, the new roads will further expand the pedestrian network and improve connectivity within the area. Figure 16 illustrates the future pedestrian infrastructure in the local area, as a result of the Melrose Park North development.

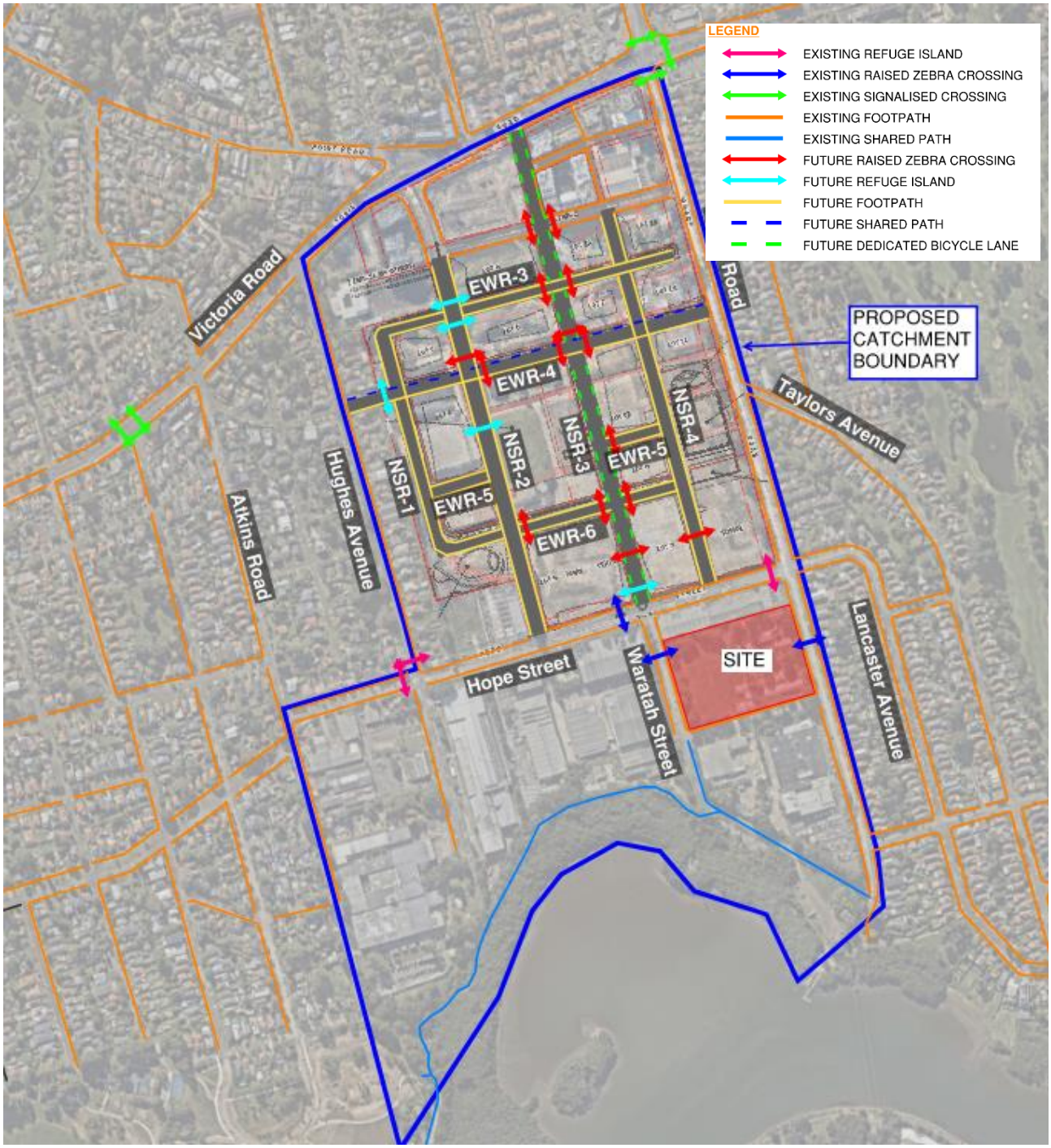


Figure 16: Future Active Transport Infrastructure
Source: Modified from Nearmap

As shown in Figure 16, within the vicinity of the site the future network includes:

- Footpaths on both sides of NSR-4 to the north of the site
- Raised pedestrian crossing on NSR-4 to the north of the site
- Separated cycle lanes on NSR-3
- Shared paths on EWR-4

Other future active transport works in the area include part of the Melrose Park South, road and footpath network, however these are yet to be approved and are currently under assessment by CoP (at the time of writing). Refer to Section 1.7.3 for further detail.

Parramatta Bike Plan

The Parramatta Bike Plan detailed below in Figure 17 outlines proposed cycling infrastructure near the site, linking it to the primary cycle networks within the precinct.

Figure 17: Proposed Parramatta Cycling Network
Source: Draft Parramatta Bike Plan 2023

As shown in Figure 17, there are a number of proposed cycle paths within the vicinity of the site. This includes an approved Shared Path known as Wharf Road Linear Park, along Wharf Road to the northeast of the site. The DA (DA/459/2024) has been approved by CoP, and it is anticipated Wharf Road Linear Park will be completed prior to opening year of MPPS. The location of Wharf Road Linear Park is shown in Figure 18.

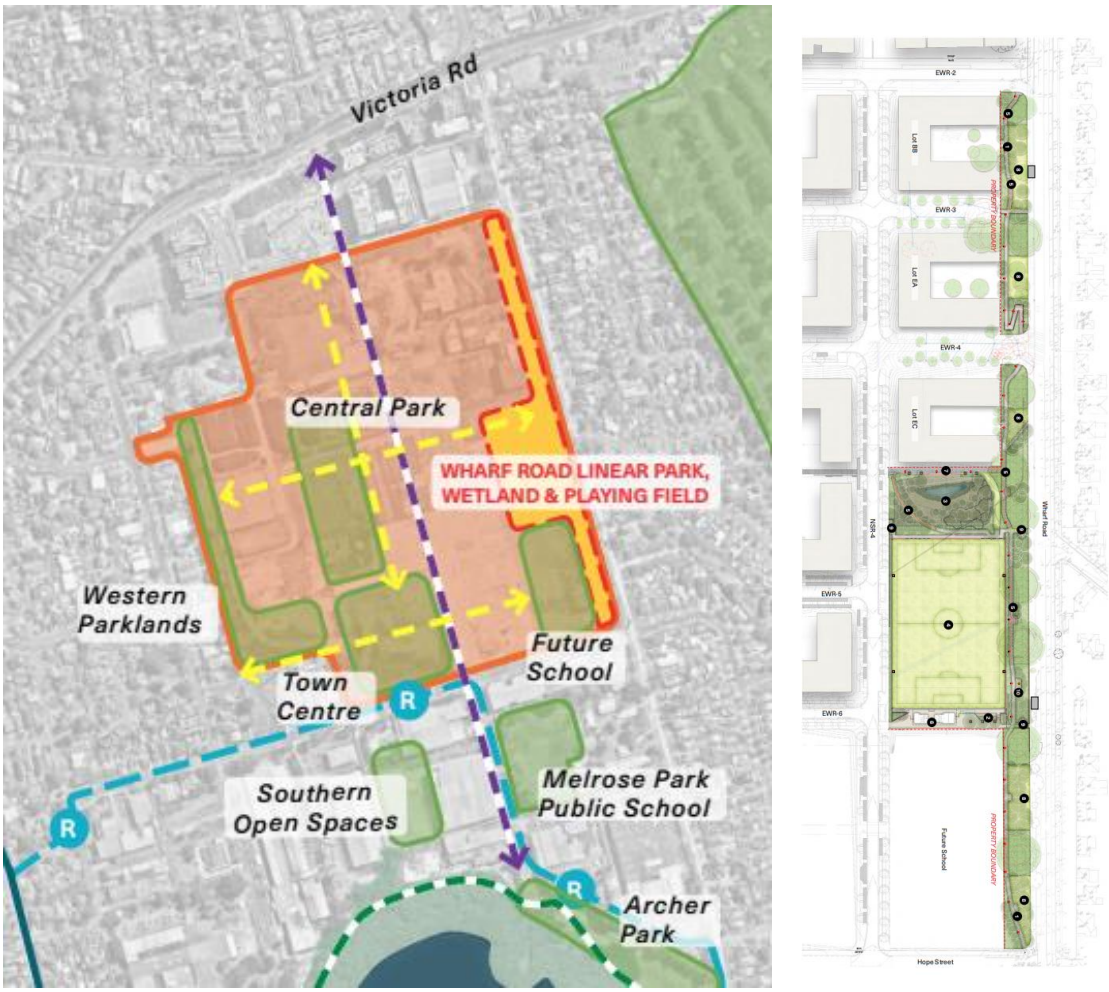


Figure 18: Landscape Plan of Wharf Road Linear Park, Wetlands & Playing Field
Source: Landscape DA Package (ASPECT Studios, 2024)

Parramatta Light Rail

As identified in the Parramatta Bike Plan, a separated cycleway along Boronia Street, Hope Street and Waratah Street is proposed. This route is the proposed corridor for the PLR Stage 2, and it is understood the implementation of this separated cycleway will be part of the PLR Stage 2 project. Figure 19 details the proposed light rail corridor which includes active transport links along these roads in close proximity to MPPS. Further details in relation to the proposed PLR Stage 2 are provided in Section 2.5.5.

Figure 19: PLR Stage 2 Indicative Active Transport Links
Source: Modified from Parramatta Light Rail Stage 2 EIS (TfNSW)

2.5 Public Transport

2.5.1 Existing Bus Services

The nearest bus stops are currently located on Hope Street, approximately 100 metres walking distance from MPPS. There are also a number of bus stops along Wharf Road approximately 250 metres from the MPPS site. Table 11 provides a summary of the existing bus routes and their frequencies from these stops, while Figure 20 shows the locations of the nearest bus stops and corresponding bus routes around the site.

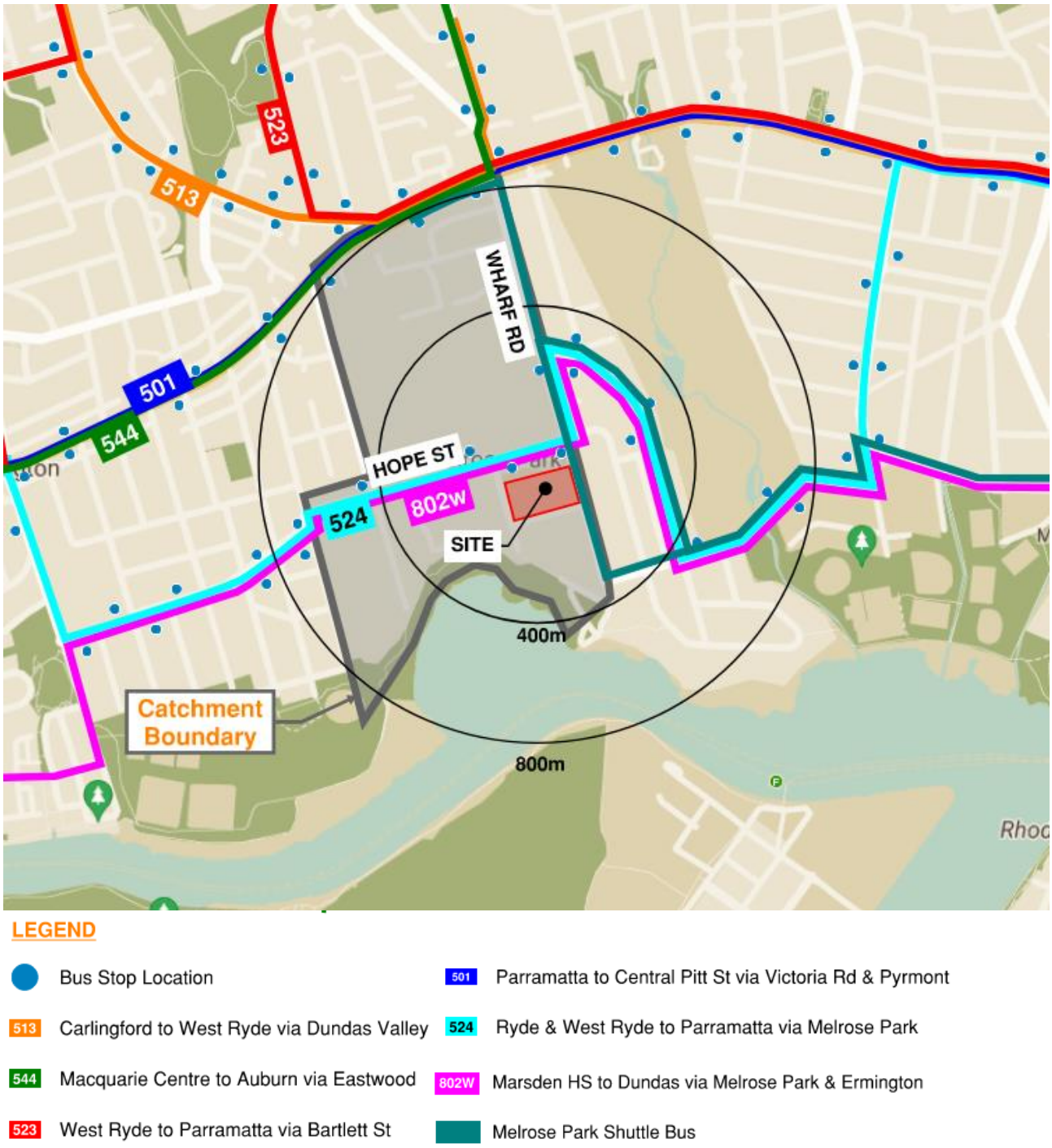


Figure 20: Existing Bus Service Network
Source: Modified from Google Maps

Table 11: Existing Public Bus Services

Bus Number	Bus Service	Frequency
501	Parramatta to Central Pitt St via Victoria Rd & Pyrmont	**Peak**: Every 15 mins **Off pea**k: Every 15 mins
513	Carlingford to West Ryde via Dundas Valley	**Peak**: Every 60 mins **Off pe**ak: Every 60 mins
523	West Ryde to Parramatta via Bartlett St	**Peak**: Every 60 mins **Off peak**: Every 60 mins
524	Ryde & West Ryde to Parramatta via Melrose Park	**Peak**: Every 30 mins **Off peak**: Every 60 mins
544	Macquarie Centre to Auburn via Eastwood	**Peak**: Every 30 mins **Off peak**: Every 60 mins
802W (School Service)	Dundas to Marsden HS via Ermington and Melrose Park	1 morning service & 1 afternoon service

In addition to the above public bus services, a private shuttle bus service provided by Sekisui is currently in operation between the Melrose Park North site connecting to Meadowbank station and Meadowbank ferry wharf between 6:00am to 10:00am and 3:00pm to 7:00pm (weekdays only). This free shuttle bus stops at 9 convenient points along the route shown in Figure 20 and is currently patronised by Melrose Park North employees and residents wishing to connect with either train or ferry services.

Initiating in 2019, it is noted the service has gathered considerable patronage over the past 5 years, averaging 300 passengers per week. Table 12 details the bus stop locations along the route.

Table 12: Existing Shuttle Bus Services

Bus Service	Bus Service	Frequency
Melrose Park – Meadowbank Wharf via Meadowbank Station (AM Route)	Wykoff Lane, Taylor Avenue at Cobham Lane, Meadowbank Station, Meadowbank Wharf	**Peak**: Every 30 mins **Off pea**k: No Services
Meadowbank Ferry Wharf - Melrose Park (PM Route)	Meadowbank Wharf, Meadowbank Station, Wharf Road opposite Jennifer Park, Wykoff Lane	**Peak:** Every 30 mins **Off-Peak:** No Services

As shown above in Table 12, the private shuttle bus service currently operates every 30 minutes during peak periods. As detailed in the TMAP as the Melrose Park Precinct expands, this shuttle service will run more frequently providing a total of 12 shuttle services during the morning and evening peak periods.

2.5.2 Future Bus Services

As outlined in the TMAP, there will be significant demand for higher frequency 'local' services further to the broader redevelopment of Melrose Park, and particularly for services linking to local rail stations and sub-regional centres. No detailed public bus service updates have been provided at this stage, however the TfNSW Bus Service Team have noted planning is underway for higher frequency local services as the population of Melrose Park increases.

2.5.3 Future Parramatta River Active Transport Bridge – PLR Stage 2 Enabling Works

Further to sections above, the most significant piece of major infrastructure identified in the TMAP as being essential to the transport network to accommodate the development of Melrose Park is an active and public transport bridge over the Parramatta River to Wentworth Point. The TMAP determined that the Melrose Bridge will be required by 2028, by which time some 6,700 dwellings would be occupied within Melrose Park based on projections available at the time of the TMAP modelling.

Construction for the Melrose Bridge is anticipated to begin in 2025 and will provide the essential active and public transport connection to the broader Sydney Metropolitan transport network, including:

- A direct link to the Sydney Metro West station at Sydney Olympic Park;
- New bus services between Top Ryde and Concord Hospital via Melrose Park;
- New public and active transport connections to the future Rhodes East Ferry Wharf (see Section 4.5);
- Direct access to the emerging Sydney Olympic Park and Rhodes regional centres; and
- Provisions for the introduction of PLR Stage 2 in the future.

Perhaps the most significant finding of the TMAP is that the Melrose Bridge and moreover the active and public transport opportunities it creates will reduce the private vehicle trip generation of Melrose Park to such a level that it can (further of course to other road network upgrades and transport strategies) appropriately accommodate the future trip demands of Melrose Park; critically, this is the case regardless of whether PLR Stage 2 is constructed.

It is anticipated these services will provide frequent and reliable levels of public transport particularly for staff travelling to the MPPS site and will therefore be relied upon.

2.5.4 Existing Railway Services

As illustrated in Figure 21, the closest railway station to the proposed MPPS site is Meadowbank Station, which is 1.7 kilometres east of the site. West Ryde station is also 1.9 kilometres to the northeast. As the catchment boundary does not extend to this area it is anticipated that students will have limited reliance on train services. However, the Melrose Park shuttle bus provides a connection for those travelling between Meadowbank train station and Melrose Park, which can be utilised by staff as part of a multi-modal journey to the site. Meadowbank and West Ryde stations are serviced by a single train line, the T9 Northern Line. Table 13 shows the frequency of services along the T9 line during the peak and off-peak periods.

Table 13: Train Services

Train Line	Train Line Service	Frequency
T9	Northern Line	**Peak**: 7 mins **Off peak**: 15 mins

Figure 22 illustrates Sydney Trains and Metro network map with the nearest stations highlighted.

Figure 21: Local Train Stations
Source: Modified from Google Maps

Figure 22: Sydney Trains Network Map
Source: Modified from Sydney Trains Map

2.5.5 Future Parramatta Light Rail Stage 2

There is currently no light rail servicing Melrose Park, however the proposed PLR Stage 2 main works is anticipated to begin construction in 2028 – 2029, (at the time of writing) noting the project is still not funded.

PLR Stage 2 will extend the light rail from Parramatta CBD to Ermington, Melrose Park, Wentworth Point, and Sydney Olympic Park as shown in Figure 23. It also includes a light rail stop along Hope Street located approximately 200 metres to the west of the site, as well as a stop on Waratah Street located approximately 300 metres south of the site. With this in mind, it is anticipated these services will be heavily utilised by staff.

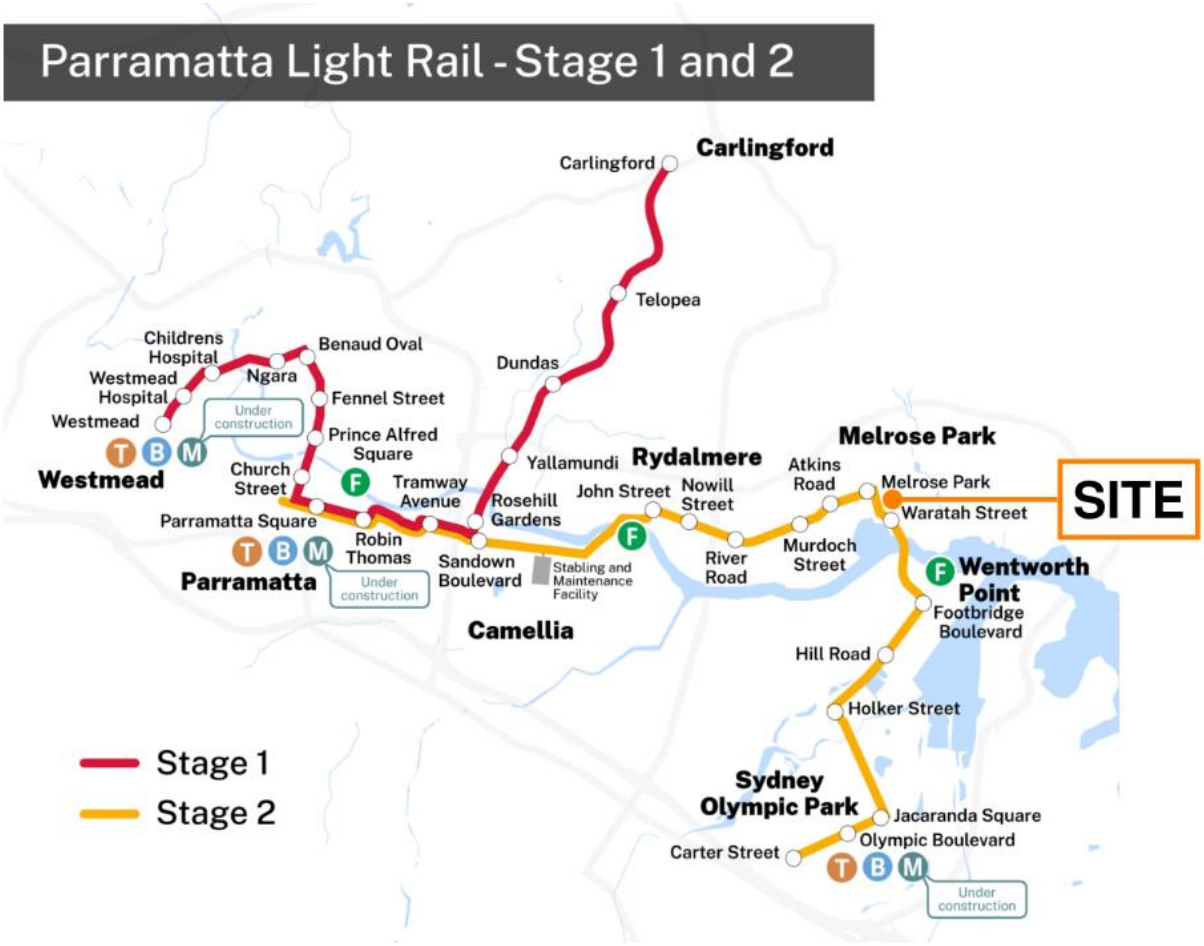


Figure 23: Proposed Parramatta Light Rail Stage 2 Route

Source: Modified from City of Parramatta – Parramatta Light Rail Stage 1 & Stage 2 Route

The PLR Stage 2 project offers an excellent public transport opportunity for Melrose Park by:

- Better integrating Parramatta CBD with Rydalmere, Melrose Park, Wentworth Point and Sydney Olympic Park
- Providing an attractive and accessible service and the potential to reduce the need for car trips and car-parking use at Melrose Park
- Facilitating the development of higher density housing through better urban design and urban form at future light rail stops on Hope Street and Wharf Road

Road Network Changes

As part of the PLR Stage 2 main works there are a range of localised network connectivity impacts that may result due to the light rail corridor crossing existing traffic routes. These include intersection upgrade works, permanent road closures, restriction of right turns across the light rail corridor, and left-in/left-out only on minor roads. As shown in Figure 24, the relevant changes proposed near to the MPPS site include:

- Signalised intersection at Hope Street / Waratah Street
- Signalised intersection at Waratah Street / Mary Street

Figure 24: PLR Stage 2 Local Road Network Changes
Source: PLR Stage 2 EIS, Technical Paper 2 – Transport and Traffic

2.5.6 Existing Ferry Services

As shown in Figure 25, the closest ferry wharf to the MPPS site is Meadowbank wharf, which is 1.8 kilometres to the southeast. As the catchment boundary does not extend to this area it is anticipated that students will have limited reliance on ferry services. However, the Melrose Park shuttle bus provides a connection for those travelling between Meadowbank wharf and Melrose Park, which can be utilised by staff as part of a multi-modal journey to the site. Meadowbank wharf is serviced by a single ferry service, being the F3 Parramatta River service. Table 14 shows the frequency of this service during the peak and off-peak periods.

Table 14: Ferry Services

Ferry Service	Ferry Service	Frequency
F3	Parramatta River	**Peak**: 30-60 mins **Off peak**: 60 mins

Figure 25: Local Ferry Wharfs
Source: Modified from Google Maps

At present, ferry services operating along the Parramatta River, including Meadowbank Wharf, offer services between Parramatta and the Sydney CBD, as well as emerging centres such as Barangaroo.

Figure 26 illustrates Sydney Ferry Services network map with the nearest wharf to MPPS highlighted.

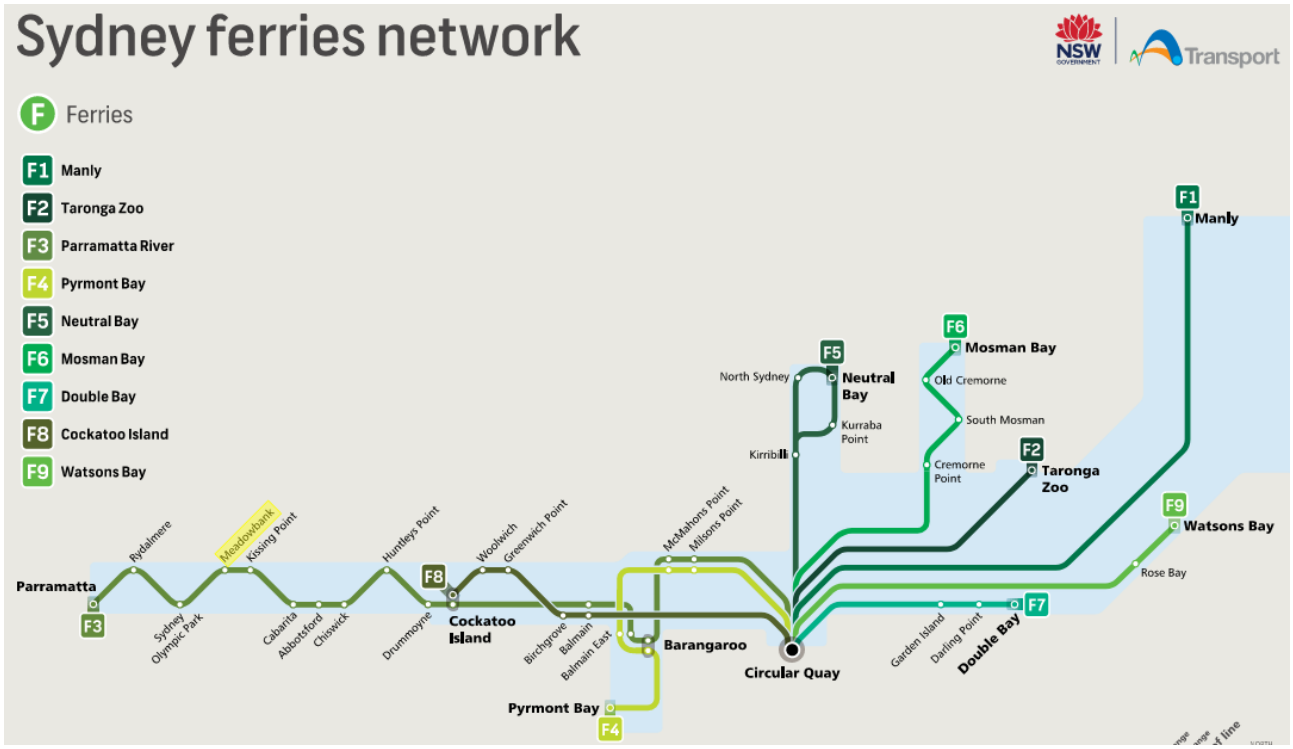


Figure 26: Sydney Ferries Network Map
Source: Modified from Sydney Ferry Map

2.5.7 Future Ferry Services

Sydney's Ferry Future reports increase in ferry patronage over the past 10 years, with key demand for trips to/from the Sydney CBD, as well as forecast population growth in areas serviced by the Parramatta River wharves, and particularly those at Sydney Olympic Park, Meadowbank and Cabarita. Notwithstanding, there remains spare capacity over most of the ferry network to accommodate additional growth.

In addition, it is understood TfNSW is investigating the provision of a new wharf at Rhodes East, likely between the John Whitton Rail Bridge and Ryde Bridge, with a decision on the final location to be based on operational and navigational parameters. It is acknowledged that no decision has been made (at the time of writing) on the location or delivery timeframe of the new wharf.

While a future ferry wharf at Melrose Park has previously been examined, the TMAP determined that a new wharf was not an essential component of the Melrose Park transport network, but that the broader suite of proposed public and active transport services and infrastructure can accommodate the future trip demands without ferry services.

2.6 Kiss & Ride

The existing school consists of one kiss & ride ('no parking') zone on Wharf Road, as well as three smaller 15-minute parking zones (during school hours) on Waratah Street, Wharf Road and Mary Street. One accessible on-street space is also available on Wharf Road. Figure 27 outlines the location and extent of existing kiss & ride zones. Observations of the existing kiss & ride operation are described in detail in Section 2.9.

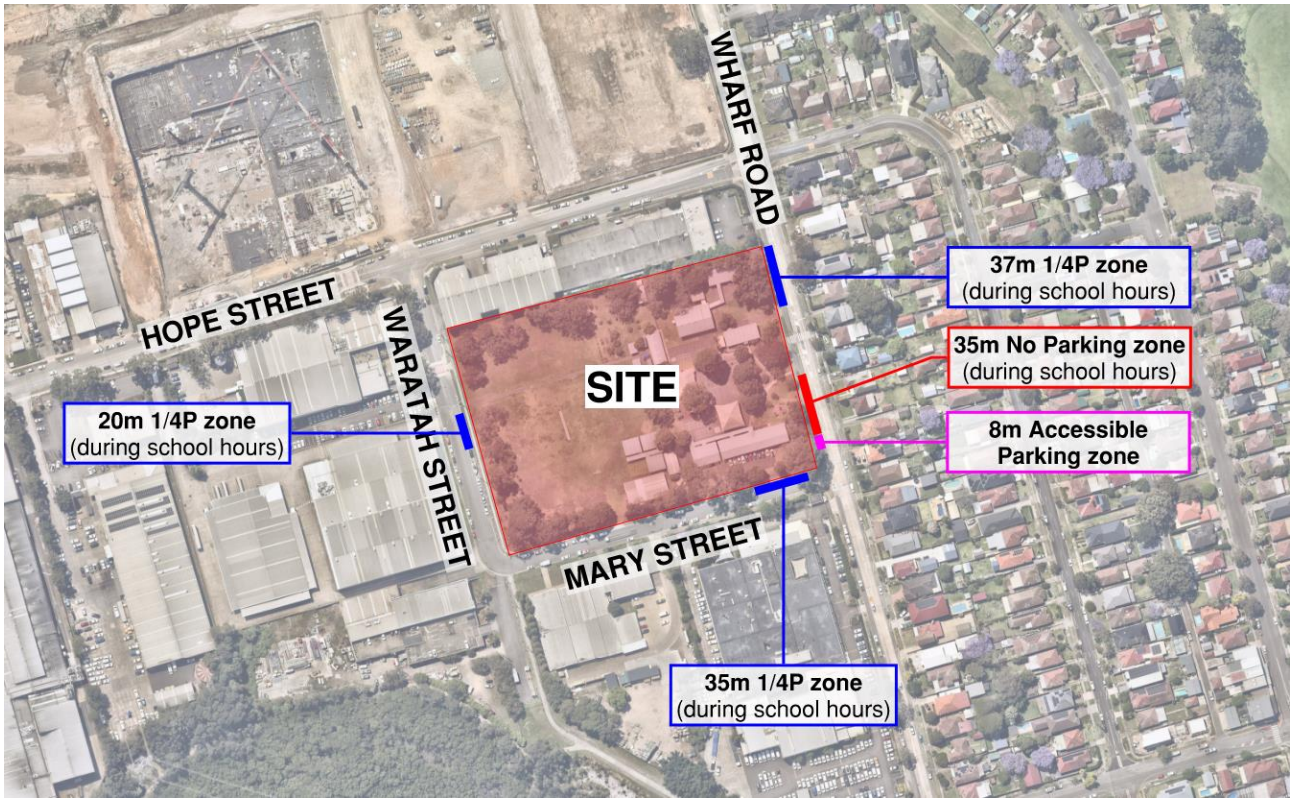


Figure 27: Existing Kiss & Ride Zones
Source: Modified from Nearmap

2.7 Car Parking

2.7.1 On-Street Parking

On-street parking is generally available on the surrounding streets, with most local streets containing unrestricted parking. However, parking is restricted in bus zones and during school days near MPPS.

Figure 28 shows the existing on-street parking restrictions in the surrounding streets within a 500m radius of the MPPS site.

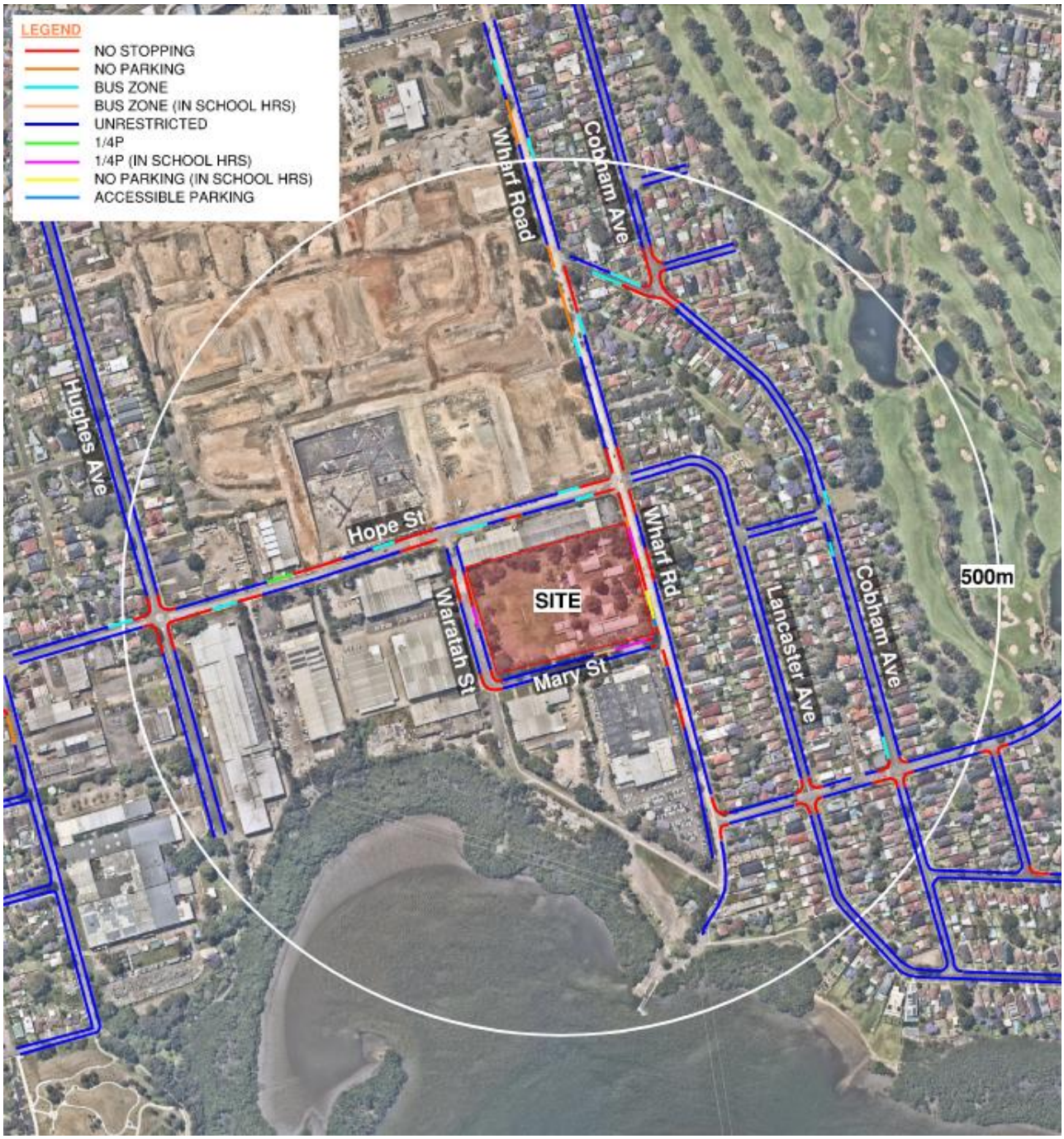


Figure 28: On-Street Parking Restrictions
Source: Modified from Nearmap

As shown in Figure 28, parking within the vicinity of the site is typically unrestricted, with a number of time restricted parking areas and bus zones close to the existing MPPS.

TTW completed two site inspections on a typical weekday in 2024, during these inspections it was observed there is generally an abundance of on-street parking capacity within a 500 metre radius of the site. Specifically, Wharf Road and Waratah Street had approximately 50% spare capacity. It was observed parking demand on Mary Street and Hope Street was higher, with approximately 30-40% spare capacity. It was assumed parking on Hope Street was mainly occupied by construction workers on Melrose Park North, while Mary Street appeared to be occupied by MPPS staff. In addition, Nearmap aerial footage was reviewed to gain an understanding of on-street parking demands. Similarly to our on-site observations it appeared Wharf Road and Waratah Street had an abundance of spare capacity, while Hope Street and Mary Street appeared to have between 30-40% spare capacity. In summary, it is considered reasonable to assume the surrounding streets have spare on-street parking capacity.

2.7.2 Off-Street Parking

The existing MPPS site contains an off-street car park, with access from Mary Street at the south side of the school. The capacity of this car park is 12 formal spaces, but some staff were observed to park informally on the grass. During our site inspections, the on-site car park was 100% occupied. Similarly, from review of Nearmap during weekdays the on-site car park appears to be 100% occupied.

The waste bins are also stored within the car park, and it is assumed that waste collection occurs on-site from this location.

2.8 Travel Mode

2.8.1 Existing School Travel Surveys

To understand the typical travel mode patterns to/from the site, travel mode surveys were conducted at the existing MPPS. The travel mode surveys were distributed online for staff to complete. For students the data was collected by teachers in the form of a 'Hands Up Survey', teachers of each class were instructed to ask students to raise their hand and confirm how they travelled to / from school on a typical day, the results were recorded by teachers and uploaded onto the Survey Monkey online. The surveys were completed on 7th November.

In summary, **19 staff** responses were received, and **160 student** responses were received. The quantity and response rate of both user groups are considered high enough to provide accurate summaries of school travel behaviour, representing 86% of staff and 86% of students.

The travel mode survey results for the morning and afternoon travel periods for student and staff data is shown in Table 15.

Table 15: Existing School Mode Share Data
Note: totals may not add to 100% due to rounding

Travel Mode	Students				Staff			
	AM %	AM Vol.	PM %	PM Vol	AM %	AM Vol.	PM %	PM Vol.
Walk	20%	32	20%	31	11%	2	16%	3
Bicycle / scooter / skateboards	2%	3	3%	4	0%	0	0%	0
Bus / train / light rail	0%	0	1%	2	0%	0	0%	0
Car, driver	0%	0	0%	0	84%	16	84%	16
Car, passenger	78%	125	77%	123	5%	1	0%	0
Total	**100%**	**160**	**100%**	**160**	**100%**	**19**	**100%**	**19**

As shown in Table 15, majority of students are being picked up and dropped off by private vehicle, with 78% and 77% in AM and PM, respectively. This is followed by students that are walking to / from the school with 20% in both AM and PM, respectively. The remaining students are shown to travel by other forms of active transport (bike, scooter or skateboard) and no usage of train or bus travel.

As shown in Table 15, typical with most school sites, staff travel mode habits are very car-dependent, with 84% of staff travelling by private vehicle in both the AM and PM peak. Following private vehicles, the results show 11% - 16% of staff walk to/from school and the remaining staff will either get picked up from or dropped off to the school.

Based on the travel mode surveys, the results reflect that whilst some students and staff use active transport modes to travel to/from school, the majority of students and staff are still relying on private vehicles to travel to/from the school. It is noteworthy to mention that Melrose Park is currently a developing area, and more pedestrian facilities will be constructed in the future which will improve the active transport (e.g. walking and cycling) split.

2.8.2 Census Travel Data

For comparison, the 2021 Journey to Work (JTW) data was also reviewed. The data provides an estimate of employee travel modes into and out of the local area for the purposes of travel to or from a place of employment. JTW data is defined by Travel Zones and can be assessed as a destination (employees in the zone, who may be from the local area or elsewhere). The site is located within the Statistical Area Level 2 (SA2) 'Ermington – Rydalmere' as illustrated in Figure 29.

Within this area, a few industrial areas and construction sites are the only major employment centre. While the wider SA2 zone is mostly residential areas. It should be noted that the development of Melrose Park will increase employment numbers in retail and commercials due to the opening of Melrose Park Town Centre.

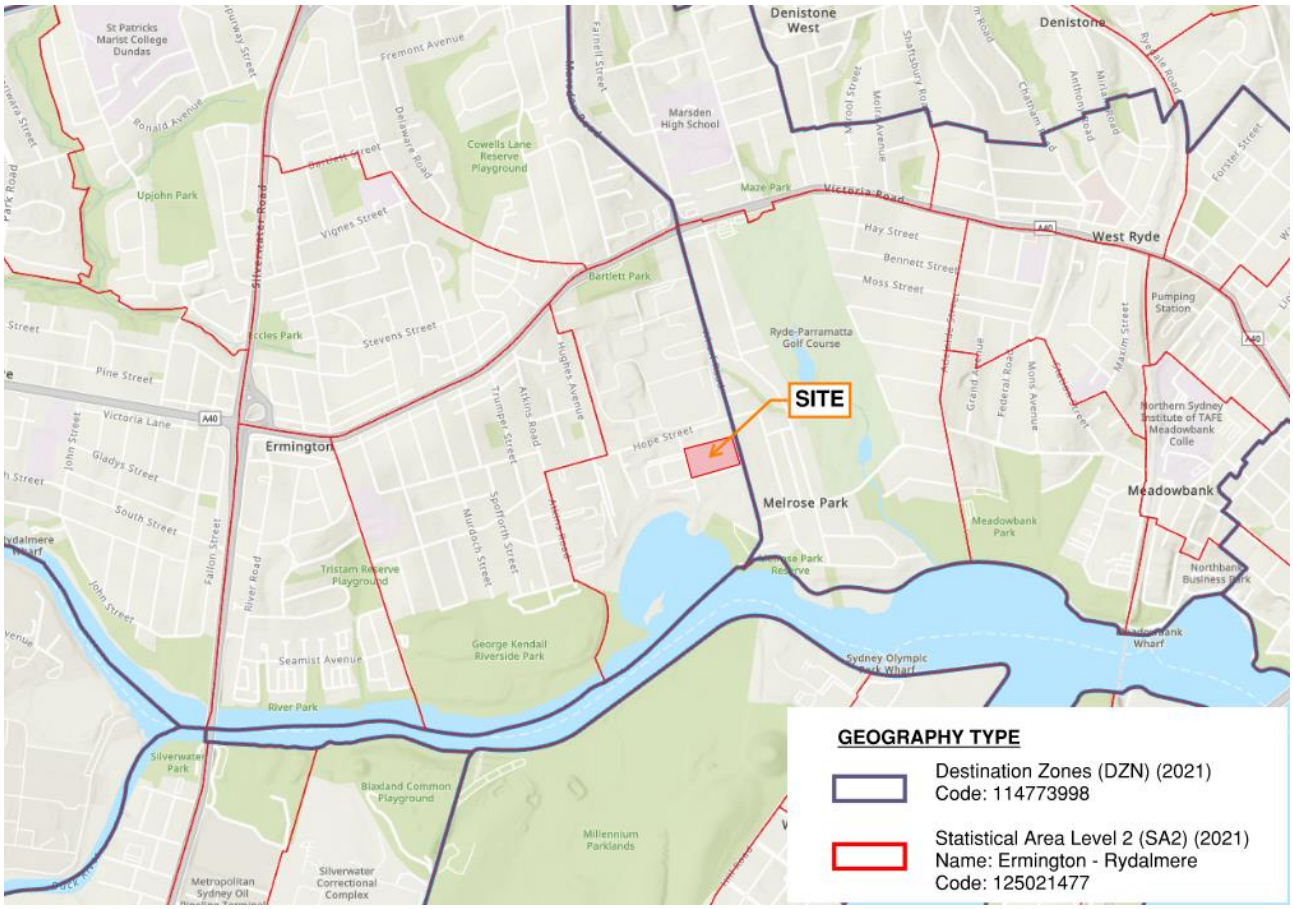


Figure 29 Statistical Area of Site
Source: Modified from ABS Maps

Table 16 provides an analysis and summary of the Census JTW travel mode splits for the 'Ermington – Rydalmere SA2. It is noted, responses for “worked at home”, “did not go to work”, and “mode not stated” have been excluded from this analysis.

Table 16: Census Travel Data
Source: ABS

Travel mode	Place of work	Place of residence
Train	5%	5%
Bus	4%	3%
Ferry	0%	0%
Tram/Light rail	0%	0%
Taxi	0%	1%
Car, as driver	80%	82%
Car, as passenger	6%	7%
Truck	1%	1%
Motorbike/scooter	1%	1%
Bicycle	1%	1%

Travel mode	Place of work	Place of residence
Other Mode	1%	1%
Walked only	2%	1%
Total	**100%**	**100%**

The 2021 Census JTW data detailed in Table 16 identified that 3% of employees typically travel to/from work via active transport (walk or cycle), while 9% of employees typically travel to/from work via public transport (train or bus). Car travel is relatively high with 86% of employees travelling to/from work via private vehicle (car driver or car passenger). The result shows a relatively high car usage for staff which is similar to the results of the school travel mode surveys.

2.9 Other Site Conditions and Observations

Observations of the existing site and nearby road network were undertaken during morning and afternoon peak periods in November 2024, with key findings noted as follows:

Morning Peak Period

- Kiss & ride activity at MPPS started occurring approximately 5 – 10 minutes before the bell, from approximately 8:50am. Activity was split between Mary Street and Wharf Road, with parents parking and walking students into the school from Mary Street (refer to Figure 31), and Wharf Road used as a typical kiss & ride zone i.e. parents remain in their car (refer to Figure 30).
- Vehicle volumes around the school were observed to be comfortably accommodated within the road network, with minimal queueing at intersections, with queues of approximately 3 – 4 vehicles forming at the west leg of the Mary Street / Wharf Road intersection.
- Staff car park was observed to be full prior to 8:45am, estimated to accommodate majority of staff.
- On-street parking within the local roads had spare capacity, particularly along Mary Street and Wharf Road. On-street parking at Waratah Street was highly used, assumed to be mainly construction workers from the nearby development.

Afternoon Peak Period

- Afternoon kiss & ride activity is self-managed, with no supervision from staff. Vehicles started parking on Mary Street as early as 15 minutes before the bell, with most parents meeting their child at the school gate. Wharf Road was observed to be less busy than Mary Street, with parents stopping for a shorter time and staying in their car.
- Similar to the morning, the vehicle volumes were accommodated within the network, with queues of approximately 6 – 7 vehicles forming at the west leg of the Mary Street / Wharf Road intersection. This queue length was observed once following the school bell and cleared within approximately one minute. Similarly, a queue of approximately 8 vehicles formed at the west leg of the Wharf Road / Hope Street intersection. This queue was observed once after the bell and cleared within about two minutes.

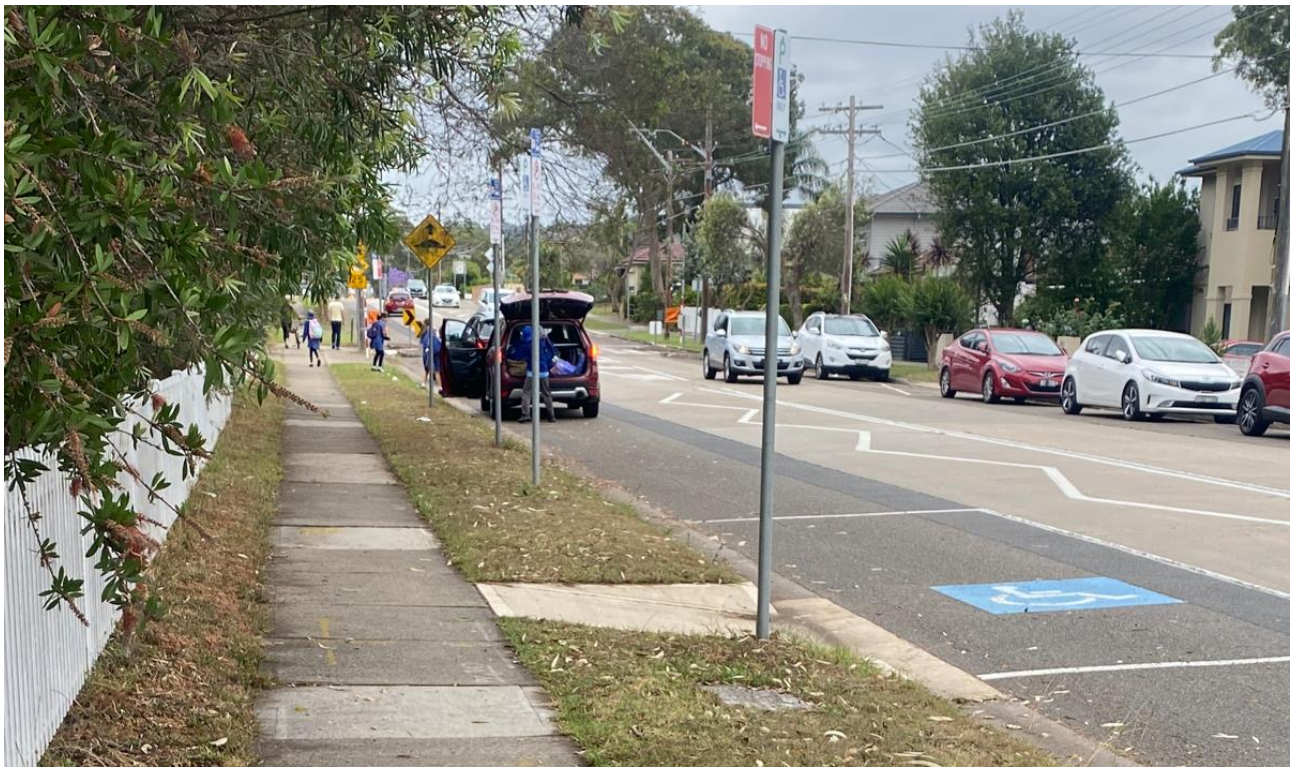


Figure 30: Morning Kiss & Ride Activity on Wharf Road
Source: TTW

Figure 31: Morning Vehicle Parking along Mary Street (Typical Park & Walk Activity)
Source: TTW

Section 3 Proposed Works

3.1 Description of Works

The activity is for upgrades to MPPS within a one to three-storey built form, including:

- Demolition of existing school buildings;
- Site preparation works including tree removal;
- Construction of the following buildings:
  - **Block A**: One (1) storey building comprising:
    - universal pre-school;
    - outdoor play area for the UPS; and
    - detached storeroom;
  - **Block B1**: Two (2) storey building comprising:
    - staff and administration areas;
    - library;
    - 4 special programs rooms;
    - Pedestrian bridge to Block B2;
  - **Block B2:** Three (3) storey building comprising:
    - 23 classrooms;
    - amenities/services cores; and
    - pedestrian bridge to Block B3;
  - **Block B3:** Three (3) storey building comprising:
    - 12 classrooms; and
    - amenities/services cores;
  - **Block C**: One (1) storey building comprising:
    - hall;
    - amenities;
    - canteen;
    - OSHC; and
    - COLA;
- Construction of two (2) car parking areas; and
- Landscaping works.

The overall proposed site plan is illustrated in Figure 32.

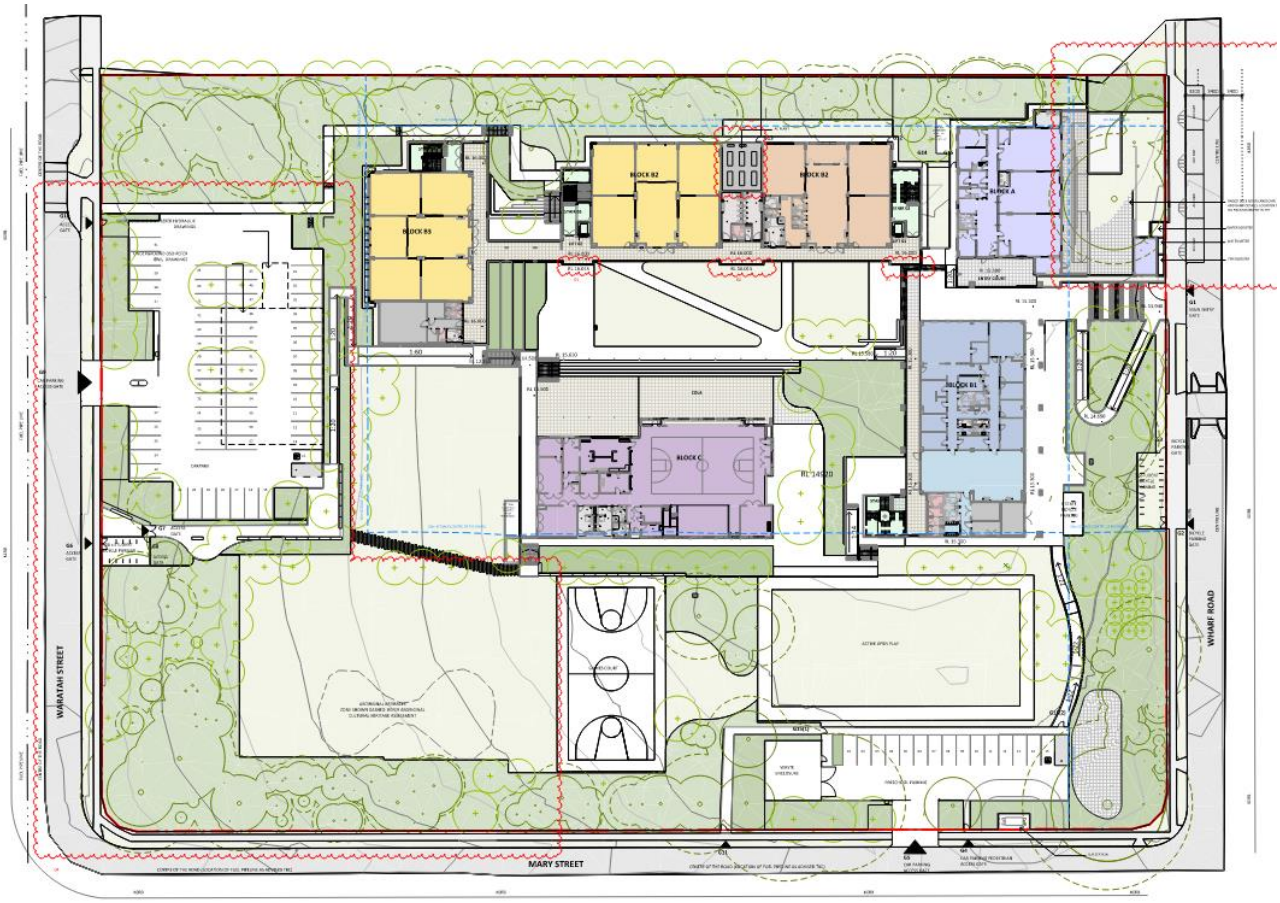


Figure 32: Proposed Site Plan
Source: PTW (MPPS-PTW-ZZ-GF-DR-A-020004 [T2])

3.2 Public Domain Works

An overall plan showing the proposed public domain works is illustrated in Figure 33 and includes the following:

- Footpath widening along the eastern site frontage on Wharf Road
- Signage changes to accommodate kiss & ride zones on Mary Street and Wharf Road
- Signage changes and civil works to accommodate accessible kiss & ride on Wharf Road
- Signage changes to relocate the existing No Parking (Buses & Coaches Excepted) zone

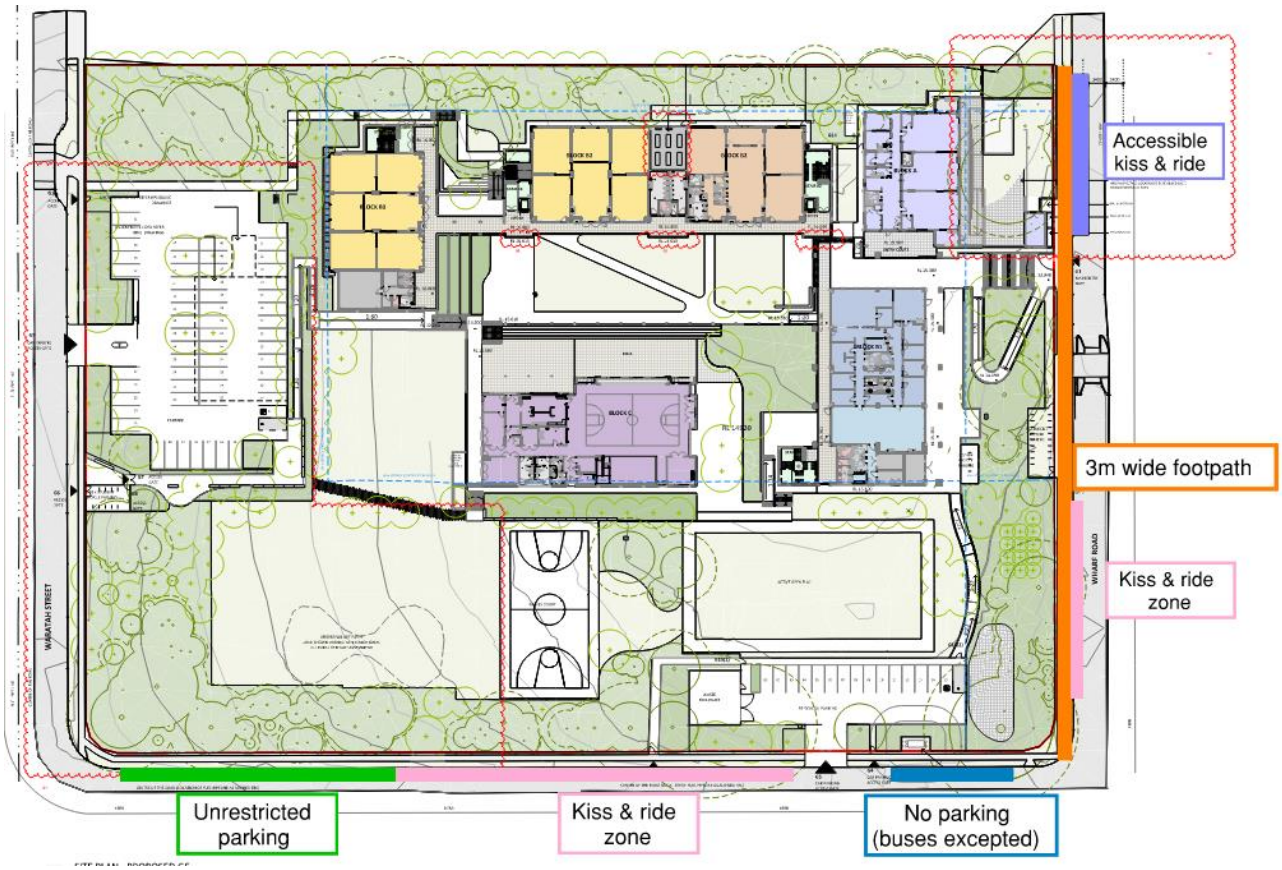


Figure 33: Proposed Off-Site Works

Source: *Source: PTW (MPPS-PTW-ZZ-GF-DR-A-020004 [T2])*
TTW Modified

3.3 Melrose Park High School Proposal

As previously mentioned, the proposed MPHS (part of a separate proposal) is located to the north of the MPPS site, on the corner of Hope Street and future road NSR-4.

There is an election commitment to build the new MPHS to meet the demand arising from redevelopment of the Melrose Park Precinct. SINSW are currently in the early planning stages of the redevelopment and a REF application has been lodged. Reference can be made to the *MPHS TAIA by TTW, (Ref: TAIA, Rev 1, TTW 28/01/2025)* and a summary of the proposed works are detailed below:

- The proposed development of MPHS will be completed in 2 stages with a maximum capacity of ~1,000 students and 79 staff. It will have a similar timeline to MPPS. Stage 1 is anticipated to be open in 2027, while Stage 2 is not yet funded but estimated by 2036.
- The MPPS development will construct a staff car park on the MPPS site which will be shared between both MPPS and MPHS, with the provision as summarised in Table 17. Adequacy of parking provision for MPHS is subject to the MPHS REF approval.

Coordination between both schools is currently ongoing with SINSW and the project teams to ensure both proposals take into consideration traffic and parking provisions. Table 17 provides a summary of proposed parking provisions.

Table 17: Staff Car Park Provision on MPPS Site

Land Use	Car Parking Provision
MPPS staff	33
MPHS staff	24
Total	**57 spaces**

3.3.1 MPHS Public Domain Proposals

The proposed public domain works associated with MPHS are detailed below:

- 2 new raised pedestrian zebra crossings on Wharf Road and Hope Street
- Footpath widening along the western footpath on Wharf Road adjacent to the proposed kiss & ride zone
- Signage changes to accommodate kiss & ride zones on Wharf Road
- Signage changes and minor public domain works to consolidate 2 bus zones on the south side of Hope Street to provide one 63 metre bus zone
- Signage changes to provide a 12-metre loading zone on the northern side of Hope Street
- Arrangements made between MPHS project team and Sekisui include the following additional works to be undertaken by the developer:
    - A new raised pedestrian crossing on NSR-4
    - Footpath widening on NSR-4 for the length of the site boundary
    - Kerb widening at accessible kiss & ride zone to accommodate wider 3.2m parking spaces
    - Signage changes to accommodate accessible kiss & ride zone on NSR-4

Section 4 Travel Demands

4.1 Transport Hierarchy

The transport strategy for the proposal is designed as a sustainable transport strategy, prioritising non-vehicle modes such as active transport (i.e. walking, cycling) and public transport, while discouraging private vehicle travel (including kiss & ride and car parking). This hierarchy is indicatively illustrated in Figure 34.

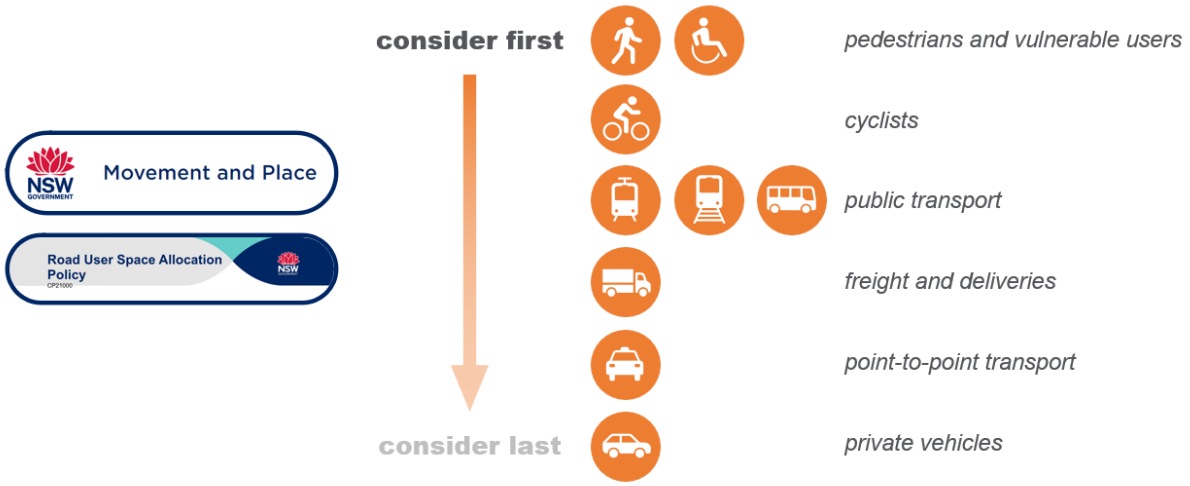


Figure 34: Sustainable Transport Hierarchy
Source: TfNSW

This strategy is consistent with NSW Government policy, specifically the Road User Space Allocation Policy, and is applied across all current SINSW projects.

4.2 School Catchment Analysis

4.2.1 Proposed Student Location Analysis

As outlined in Section 2.2, the existing walking distance catchments and an analysis of student locations has been undertaken to understand the distribution of students according to their distance of travel to the school. This analysis utilised existing depersonalised student location data provided by SINSW of the enrolments at MPPS in late 2024.

As the proposed school catchment boundary is getting smaller and will mainly cater for students who live within the new Melrose Park precinct which is still under construction i.e. a number of dwellings are currently not built, existing student location data is not an accurate representation of future conditions. To complete a more accurate assessment of future student locations a first principles analysis using land use zones in accordance with the proposed rezoning of the Melrose Park Precinct and the Parramatta DCP have been completed. The methodology is detailed below:

- Reference was made to the Melrose Park Master Plan (Figure 8.2.6.1.1 of Parramatta DCP) to understand the proposed residential zones within the school catchment
- To be conservative 100% of students (720 students) have been included as part of this assessment
- As shown in Figure 35, 100% of students (720 students) have been evenly distributed across the residential zones hatched in blue within the proposed school catchment. This provides an understanding of where students would live and ultimately determine how they would travel to / from school.

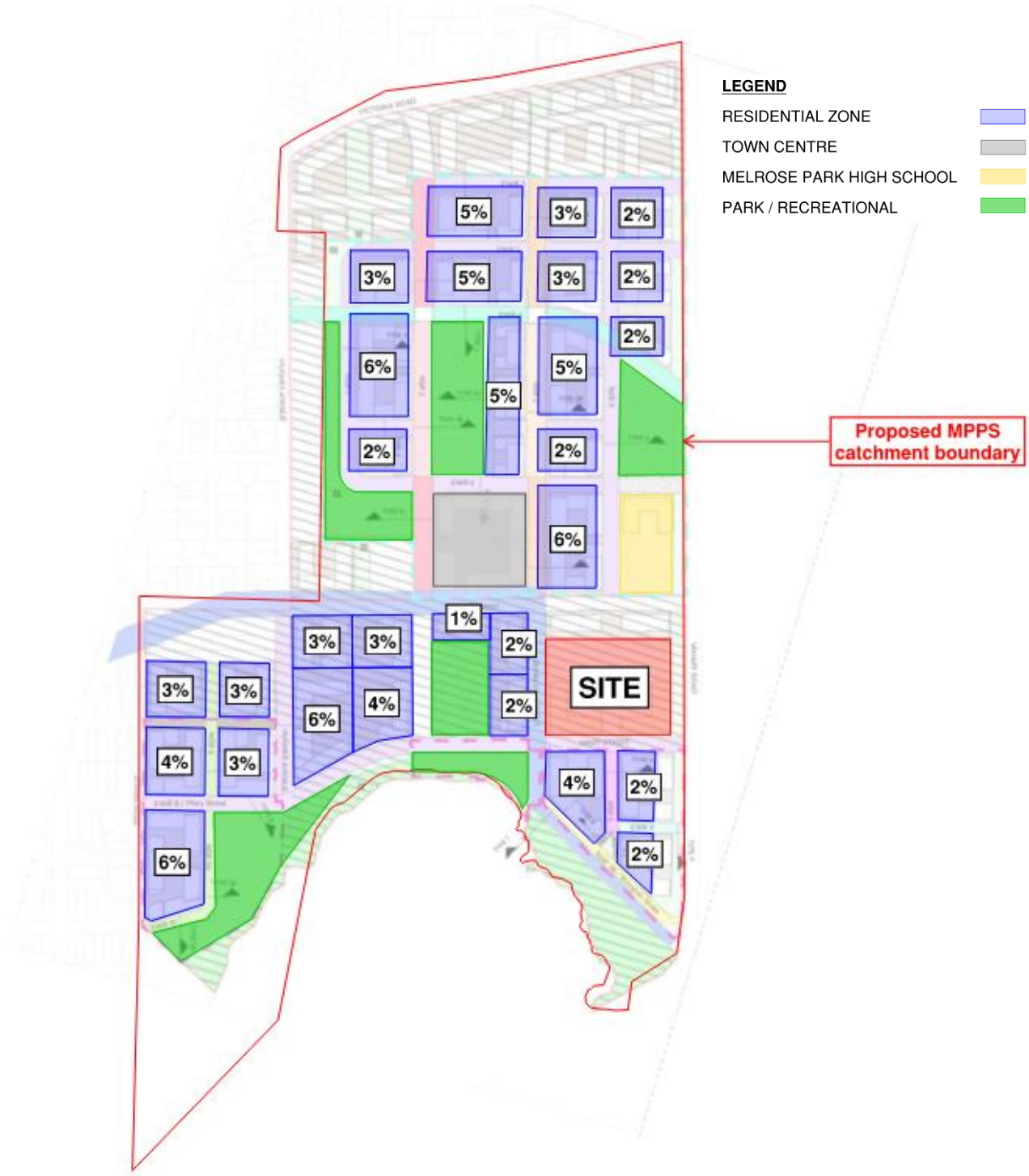


Figure 35: Land Use Zone Student Distributions

Source: TTW Modified, Parramatta DCP Melrose Park Master Plan

As shown in Figure 35, it is anticipated 52% of students are expected to live to the north of the site, within the Melrose Park North Precinct. 8% of students are estimated to live to the south of the site and approximately 40% are anticipated to live to the west of the site within the Melrose Park South Precinct.

The assessment goes into further detail by analysing the straight line and walking distances to / from the site based on the future student locations. Figure 36 shows the proposed MPPS catchment boundary and outlines the walking distance catchments for the 400m, 800m, 1200m, 1600m and 2300m walk. These are roughly equivalent to the 5-minute, 10-minute, 15-minute, 20-minute and 30-minute walk, respectively.

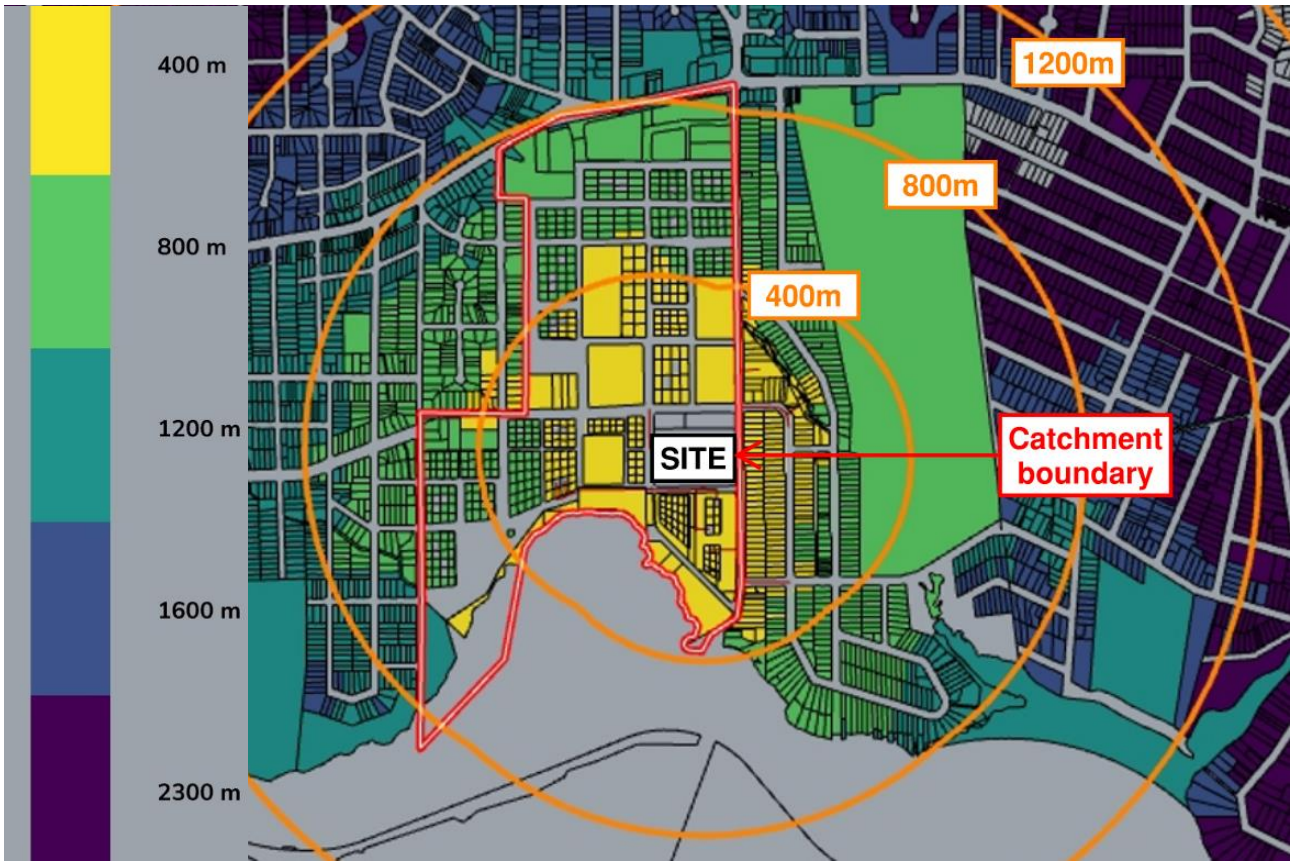


Figure 36: Future Walking Distance Analysis
Source: TTW

As shown in Figure 36, the entire proposed school catchment is within an 800 metre radius of the site, therefore identifying all students are located within no further than 800 metres from the site or a 10 minute walk, meaning walking and cycling to the site will be highly encouraged. Table 18 provides a detailed breakdown of the proposed actual walking distance and notional distance (straight line distance) based on the proposed student locations.

Table 18: Proposed Student Location Distribution

Distance	Actual Walking Distance		Notional Distance	
	%	Students	%	Students
0 – 400m (5min walk)	29%	212	49%	350
401 – 800m (10min walk)	71%	508	51%	370
801 – 1200m (15min walk)	0%	0	0%	0
1201m – 1600m	0%	0	0%	0
1601 – 2300m	0%	0	0%	0
> 2300m	0%	0	0%	0
Total	**100%**	**720**	**100%**	**720**

As shown in Table 18:

- Approximately 29% of students are forecast to live within a 5-minute walk (400m walking distance) of the school site.
- The remaining 71% student population will live within a 10-minute walk (800m walking distance) of the school site, due to the proposed catchment boundary size, which has a radius of about 800m.

4.2.2 Comparison Between Existing and Proposed Student Locations

Whilst MPPS is an existing school with existing travel mode trends, it is important to highlight the proposed school catchment boundary is significantly reducing in size to predominately cater for students living only within the Melrose Park Precinct. As a result, new travel mode patterns will be developed based on where future students will be located within the catchment.

Table 19 includes a comparison of the existing and proposed student location analysis to understand the differences in actual walking distances from the site.

Table 19: Student Location Distribution Comparison

Distance Bracket	Existing Actual Walking Distance		Future Actual Walking Distance	
	%	#	%	#
0 – 400m (5min walk)	7%	12	29%	212
401 – 800m (10min walk)	33%	61	71%	508
801 – 1200m (15min walk)	23%	43	0%	0
1201m – 1600m	7%	12	0%	0
1601 – 2300m	15%	27	0%	0
> 2300m	16%	29	0%	0
Total	**100%**	**185**	**100%**	**720**

As shown in Table 19, the key findings derived from this analysis include the following:

- Currently only 7% of students live within 400m (5-minute) walk of the school, in the future this is to increase to 29% of students.
- Approximately 40% of students currently live within an 800m (10-minute) walk of the school, but in the future, this is forecast to increase to 100% of students.
- The entire proposed school catchment boundary will sit within 800m walking distance, meaning all students will live within a 10-minute walk of the school site. Therefore, the transport strategy for the proposed MPPS upgrade will focus heavily on active travel to and from school, with minimal usage of private vehicles.
- 60% of students currently live outside 800m (10-minute) walk of the site, while in the future, it is forecast 0% of students will live outside 800m walk. It is understood there will be a transition period, where students who currently live within the existing catchment (61%) but outside the proposed catchment will still attend MPPS, this has been taken into consideration as part of the proposed travel mode targets and has been assessed in further detail as part of the traffic impact assessment included in 10.9.

4.3 Travel Scenarios

The projected travel mode splits for students and staff travelling to / from school are presented for two different post-development scenarios including **moderate** and **reach** mode splits. The **baseline** mode split scenario and travel demands are also presented for reference and comparison. The mode split scenarios are summarised as follows:

- **Baseline** – existing travel splits applied to existing student and staff numbers
- **Moderate** – moderate travel splits applied to future student and staff numbers
- **Reach** – reach travel splits applied to future student and staff numbers

Table 20 summarises the existing, moderate and reach mode splits for each different mode of transport and for both students and staff. Table 21 and Table 22 show the projected travel demand numbers by applying the mode splits to the student and staff populations, respectively. Refer to Section 1.5 for further detail regarding future student and staff numbers.

The basis for the transport assessment presented in the remainder of this document will adopt a conservative approach that considers each of the travel mode scenarios and assesses whichever results in the largest travel demand (unless otherwise indicated).

Table 20: Mode Share Scenarios

Travel mode	Students			Staff		
	Baseline	Moderate	Reach	Baseline	Moderate	Reach
Walk	20%	45%	75%	13%	3%	5%
Bike / scooter	2%	5%	20%	0%	2%	5%
Bus / train / light rail	1%	0%	0%	0%	15%	30%
Car, passenger	77%	50%	5%	3%	0%	0%
Car, carpool	0%	0%	0%	0%	5%	10%
Car, driver	0%	0%	0%	84%	75%	50%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 21: Student Travel Demand Projections

Students		Maximum Capacity	
Travel mode	**Baseline**	**Moderate**	**Reach**
Walk	144	324	540
Bike / scooter	14	36	144
Bus / train / light rail	7	0	0
Car, passenger	554	360	36
Total[1]	**720**	**720**	**720**

[1]Note: Total student number does not include preschool students, as a mode share target has not been developed for preschool students due to limited information on student locations. Instead, the Parramatta DCP requirements for preschools will be relied upon for calculating required transport provisions.

Table 22: Staff Travel Demand Projections

Staff		Maximum Capacity	
Travel Mode	**Baseline**	**Moderate**	**Reach**
Walk	7	2	3
Bike / scooter	0	1	3
Bus / train / light rail	0	8	17
Car, passenger	2	0	0
Car, carpool	0	3	6
Car, driver	46	41	28
Total[1]	**55**	**55**	**55**

[1]Note: Total staff number also includes the 5 preschool staff, as it is anticipated that staff travel habits will be relatively similar for both preschool and primary school staff.

4.3.1 Baseline Scenario

The baseline scenario has been derived based on existing travel data collected at MPPS. The students and staff at the school were surveyed in November 2024, and the results of this survey are summarised in more detail in Section 2.8.1. The travel mode splits shown in Table 20 are the average of the AM and PM results.

This scenario provides a reference point for developing the forecast travel mode splits for the redeveloped MPPS. However, it is expected that this project will be able to achieve more ambitious travel mode splits given the existing school catchment is reducing in size, resulting in less focus on car travel and a greater uptake in active and public transport.

4.3.2 Moderate Scenario

The moderate scenario represents the expected travel demands based on a combination of existing travel habits, plus anticipated travel habits based on the proposed school catchment and the project's transport provisions.

It is expected that this project will result in significantly different travel mode splits to the baseline scenario, with less focus on car travel and a greater uptake in active and public transport. This is due to:

- Reduction of catchment boundary to approximately 800m radius in size
- Increased portion of students living within a 10-minute walk of the school from 40% in the existing condition, up to 100% post-development
- Improved infrastructure works proposed at the site including upgraded pedestrian and cyclist infrastructure
- The Melrose Park Precinct currently being developed will provide good pedestrian and cyclist infrastructure within the vicinity of the site, including shared paths and footpaths along the proposed road network

The moderate scenario takes into consideration the transition period from the existing school population and catchment boundary to the proposed reduced catchment boundary, as well as the progress of the Melrose Park Precinct which is forecast to be still under construction as the proposed school opens. In this transition period, travel mode trends may align closer to the baseline mode splits, including a heavier reliance on car travel. This is reflected in the forecasted 50% car usage for students and 75% for staff.

4.3.3 Reach Scenario

The project is seeking to align with the NSW Government's Sustainable Transport Hierarchy (refer Figure 34), with the goal of reducing private vehicle usage (including kiss & ride) and giving priority to active and public transport. The reach scenario reflects this strategy by aiming for an ambitious uptake in active and public transport, and reductions in car travel.

In addition, the TMAP transport planning objectives note that the Melrose Park Precinct has been planned with the goal of delivering balanced, integrated and sustainable outcomes to achieve the proposed transport targets of 5% walking and cycling mode share, 45% public transport mode share and 50% car mode share. It is also noted that these mode shares are for peak hour trips external to the precinct, which are relevant to staff trips to and from the site, and the reach travel mode splits for staff generally align with these TMAP targets. It is anticipated that trips within the precinct (i.e. by students) will be primarily undertaken by active transport.

As also discussed in Section 4.2, this project is unique in that the proposed catchment boundary has a radius of maximum 800m measured from the school site, meaning the entire catchment area is accessible within about a 10-minute walk or 5-minute cycle from the school. This small-scale catchment area means that all students would have the opportunity to walk or cycle to school, which is reflected in the significantly large usage of active transport shown in the reach scenario.

While the reach mode splits are ambitious and depart from the baseline and moderate scenarios, they are considered realistic and feasible due to the above grounds. The reach scenario is not expected to be fully achieved immediately, particularly as the existing school transitions to the new catchment boundary, but will progress gradually as the population grows, and with the implementation of a School Transport Plan.

Further, the travel mode scenarios have been presented and discussed with both TfNSW and CoP at the TWG meeting held on 13th November 2024. At the time of presenting, the student reach scenario included 10% car usage and 90% active transport. The feedback from both authorities was that these mode splits were not ambitious enough, considering the opportunities of this site. Therefore, as per the recommendations received, the active transport mode split was updated to 95% (and specifically, a 20% bike mode split, as requested by TfNSW) and car travel reduced to 5%. Refer to Section 1.9 which summarises the consultation undertaken as part of this proposal, including more details of this TWG meeting.

Section 5 Pedestrians

5.1 Demands

Future pedestrian volumes have been calculated based on the existing and proposed travel mode splits above in Section 4.3. These are summarised in Table 23 for each scenario.

Table 23: Summary of Pedestrian Travel Demands

Walking	Mode Split				Travel Demand		
Scenario	**Baseline**	**Moderate**	**Reach**	**No.**	**Baseline**	**Moderate**	**Reach**
Students	20%	45%	75%	**Students**	144	324	540
Staff	13%	3%	5%	**Staff**	7	2	3

This assessment considers the scenario which results in the largest travel demand as the most conservative approach. As highlighted in Table 23, this scenario would be with the reach mode splits applied resulting in a demand of 540 students walking to / from school, and with the baseline mode splits applied resulting in a demand of 7 staff walking to / from school.

Note that the baseline 13% mode split for staff walking to school is unusually high. This is due to the small pool of baseline staff members that were surveyed *(i.e. an average of 3 staff currently walk, when compared to the baseline 19 staff this results in 13%)*. The moderate and reach scenarios include more typical walking mode split estimates for staff when applied to a larger portion of staff. Nonetheless, these travel demand numbers have been utilised with a maximum travel demand of 7 staff.

5.2 Proposal

The scope of proposed pedestrian provisions including site access points and footpath upgrades are illustrated inFigure 37 and summarised below:

- Proposed main entry on Wharf Road on the eastern site frontage.
- Proposed secondary access points on all site frontages, including Mary Street to the south and Waratah Street to the west.
- Footpath upgrades along Wharf Road to the east to a total width of 3m (extend to the kerb)

It is noted that the public domain works will be subject to separate applications and approvals outside this REF.

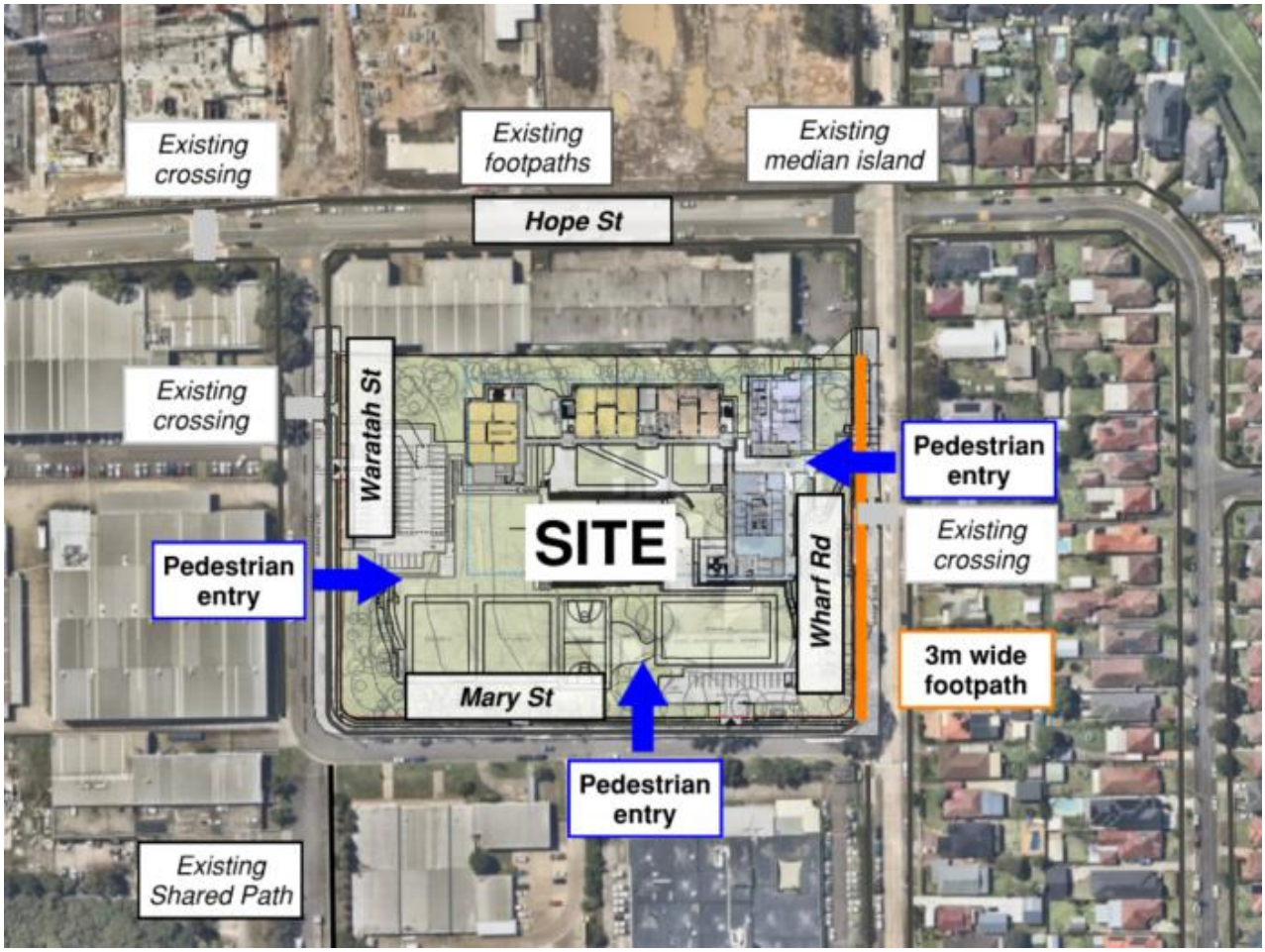


Figure 37: Summary of Pedestrian Facilities
Source: Modified from PTW (MPPS-PTW-ZZ-GF-DR-A-020004 [T2])

5.3 Analysis

5.3.1 Proposed Students Per Link Analysis

As part of the catchment analysis conducted for the site, the usage along each footpath link in the catchment has been assessed. The analysis calculates the shortest paths between each residence and the school site to produce a summary of the path usage as shown in Figure 38. The percentages are shown in Figure 38.

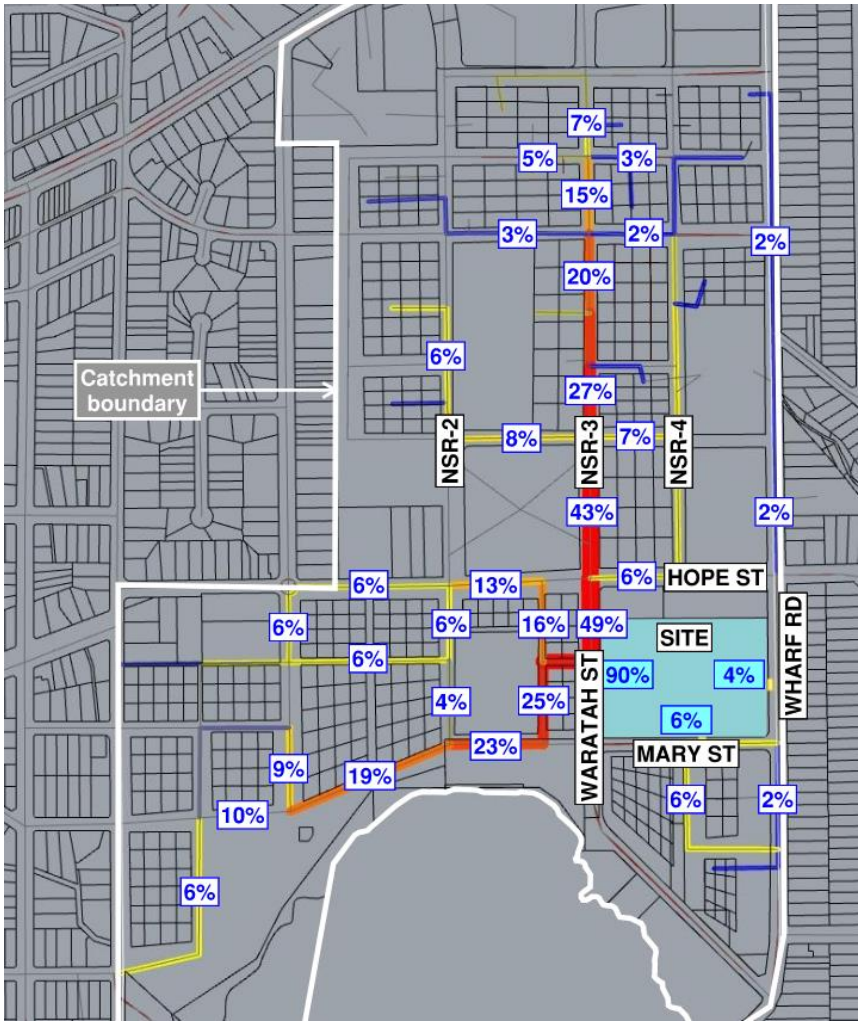


Figure 38: Students Per Link Analysis with Percentages Demand
Source: TTW

As shown in Figure 38, the analysis showed that 51% (43% + 6% + 2%) of students will travel to / from the Melrose Park North Precinct, 41% (16% + 25%) will travel from the western side of the Melrose Park South precinct and approximately 8% (2% + 6%) will travel from the southern side of the school. The analysis has also shown that NSR-3, Waratah Street and Hope Street are the main streets that students will utilise to travel to or from the school.

To get a better understanding of the student demands, the above percentages are then applied to the anticipated student walking mode splits as shown in Figure 38.

- The moderate mode split of 342 students has been adopted, as this travel mode provides more realistic travel patterns for Stage 1 as the existing school goes through a transitional period of students still living outside walking distance to school.

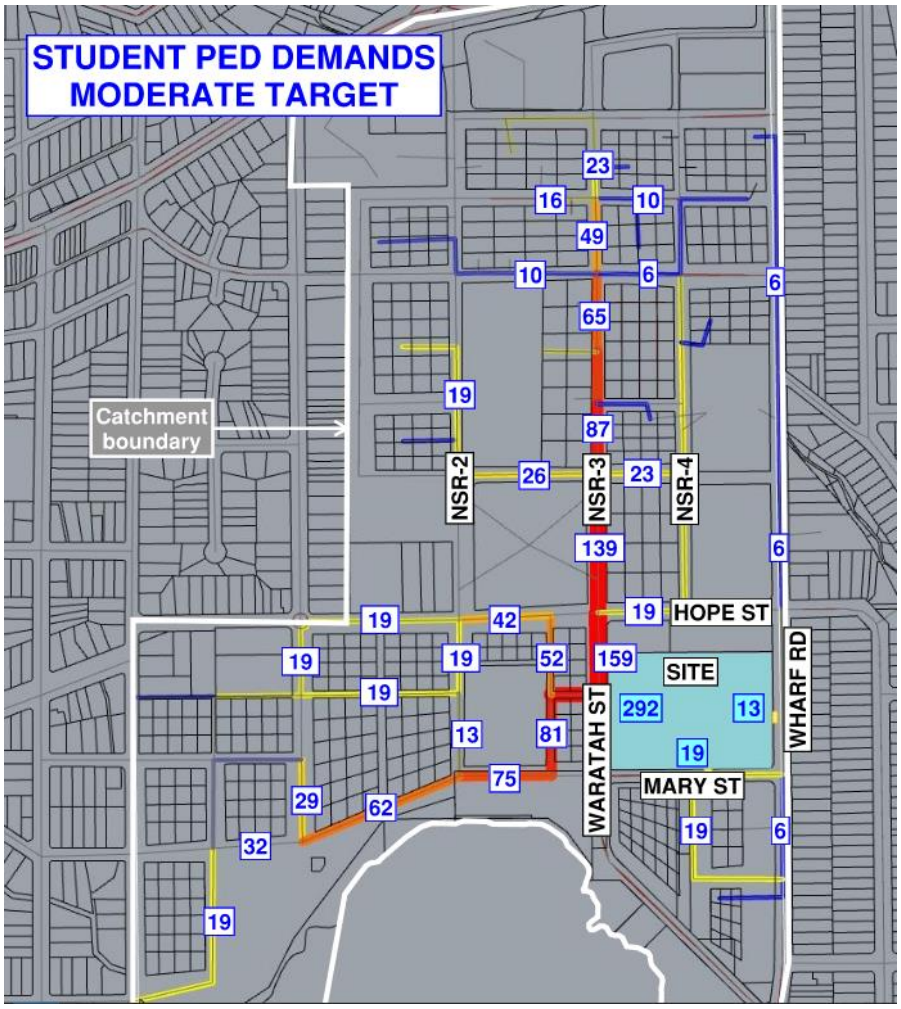


Figure 39: Walking Demand Numbers
Source: TTW

Key outcomes of this analysis include:

- The predominant approach routes to the site are via future road NSR-3 to the north and via the future road network to the west, including the future Mary Street extension. Majority of walking students are arriving / departing the site via the Waratah Street entry point.
- It is estimated that 90% of students (292 students) will access the site via Waratah Street. 159 students will travel from the north, utilising NSR 3 as the main path to the school, 133 students will travel from the west, utilising Hope Street and Waratah Street as the main pathway to the school. A small portion of students will utilise the Mary Street and Wharf Road pedestrian access points.

5.3.2 Adequacy of Proposal

The proposed pedestrian infrastructure works have been developed based on the students per link analysis outlined above. Key considerations of the proposed works include:

- Waratah Street currently provides footpaths along both sides, there is also an existing wombat crossing to the north of the proposed pedestrian access. The existing footpaths are considered satisfactory to accommodate pedestrian demands.
- The other footpaths surrounding the site are not forecast to be highly used by pedestrians with 6% at Mary Street and 4% at Wharf Road.

- Wharf Road footpath is proposed to be widened to predominantly support pedestrian movements from the kiss & ride zone, and to provide additional general waiting space for parents picking up or dropping off students.
- As outlined in Figure 38, approximately 51% of students are forecast to arrive from the north of Hope Street. The existing raised crossing on Hope Street to the northwest of the site, as well as the existing raised crossing on Waratah Street will accommodate safe pedestrian movements to and from the Melrose Park North precinct. Pedestrians arriving from the west will similarly be able to use the existing crossing on Waratah Street to safely cross to / from the school site.
  - Note, as part of the PLR Stage 2, the intersection of Hope Street / Waratah Street / NSR-3 is proposed to be upgraded to traffic signals, which would continue to provide safe pedestrian crossing opportunities at this intersection.
- Due to the low pedestrian demand from the future Holdmark sites to the south of approximately 6%, a crossing on Mary Street is not required as part of this proposal. However, CoP is in discussions with the Holdmark sites developer, in which CoP have requested the developer to provide future pedestrian crossings on Mary Street at the mid-block and at the Wharf Road intersection as part of the Holdmark sites project. These additional crossings will benefit MPPS too and further assist with pedestrian movements around the site. It is noted that there is currently no pedestrian demand to the south of the site as the existing land use is industrial. Once the Holdmark sites are developed, pedestrian demand will increase, by which time the crossings requested by Council are expected to be implemented by the developer.

On this basis, the proposed upgrade includes footpath widening along Wharf Road only. The proposal does not include any additional pedestrian crossing works, as the forecast demand will be sufficiently supported by the location and extent of the existing crossings.

Section 6 Cyclists

6.1 Demands

Future cyclist volumes have been calculated for the proposed travel mode splits above in Section 4.3, and are summarised in Table 24 for each scenario.

Table 24: Summary of Cyclist Travel Demands

Bike / Scooter	Mode Split				Travel Demand		
Scenario	**Baseline**	**Moderate**	**Reach**	**No.**	**Baseline**	**Moderate**	**Reach**
Students	2%	5%	20%	**Students**	14	36	144
Staff	0%	2%	5%	**Staff**	0	1	3

This traffic assessment considers the scenario which results in the largest travel demand as the most conservative approach. As highlighted in Table 24, this scenario would be the student and staff numbers with the reach mode splits applied, resulting in a demand of 144 students and 3 staff cycling to / from school.

6.2 Proposal

6.2.1 Student Cyclist Facilities

The proposal includes bicycle storage with capacity for 50 student bicycle parking spaces, distributed across the Wharf Road and Waratah Street school entry points as outlined in Figure 40. The Wharf Road bicycle storage area contains 32 parking spaces and its own entry point. The Waratah Street bicycle storage area contains 18 parking spaces and can be accessed via the adjacent entry point.

The proposal will also include space set aside for future installation of additional bicycle parking spaces as the mode share increases towards the reach scenario (20%, or ~144 spaces).

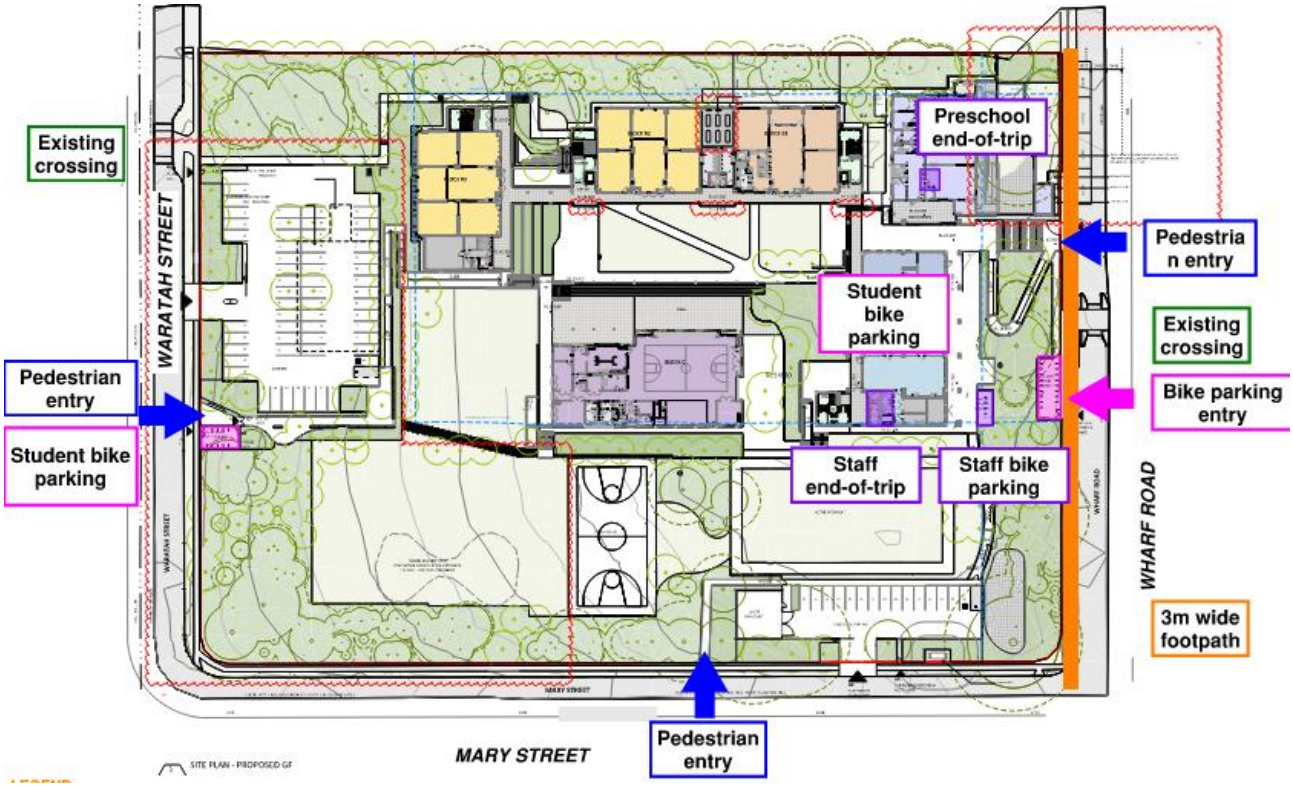


Figure 40: Proposed Bicycle Parking and End-of-Trip Facilities
Source: Modified from PTW (MPPS-PTW-ZZ-GF-DR-A-020004 [T2])

6.2.2 Staff Cyclist and End of Trip Facilities

The proposal includes 8 bicycle parking spaces for staff, located adjacent to the end-of-trip facilities and accessible via Wharf Road, as shown in Figure 40.

2 unisex shower / change facilities, including 10 lockers will also be provided for staff as shown in Figure 40. 1 unisex shower / change facility will also be provided at the preschool for staff as shown in Figure 40.

6.3 Analysis

6.3.1 Proposed Students Per Link Analysis

As outlined in Section 5.3.1, analysis of the usage along each footpath link in the proposed school catchment has been undertaken. The percentages shown in Figure 38 have been applied to the future number of potential students who travel by bicycle / scooter / skateboard to school. Similar to Section 5.3, to get a better understanding of the student demands in opening year, the moderate mode split has been adopted. The future usage numbers are shown in Figure 41.

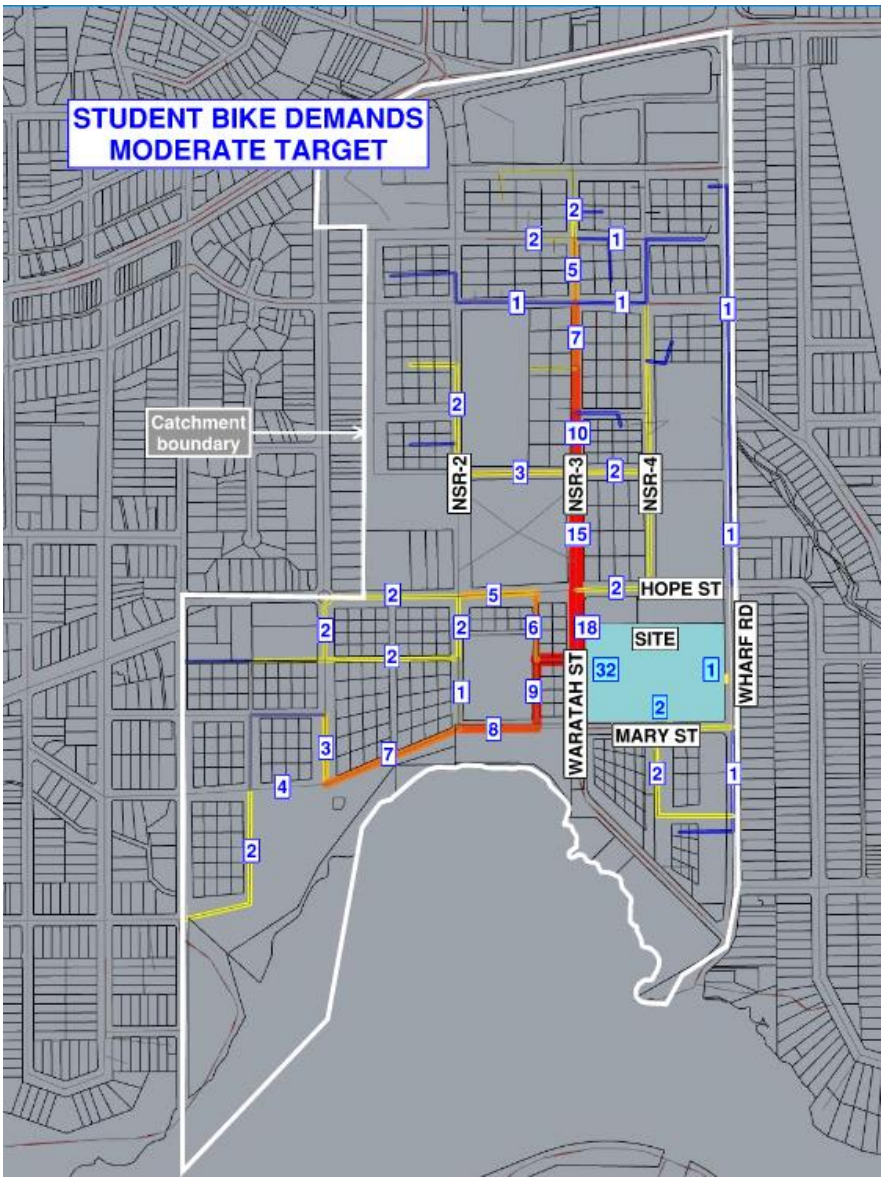


Figure 41: Cycling Demand Numbers
Source: TTW

Key outcomes of this analysis include:

- The approximate directional split of students cycling to the site is 51% from the north, 42% from the west and 8% from the south. The predominant approach routes to the site are via future road NSR-3 to the north and via the future road network to the west, including the future Mary Street extension.
- 32 students are anticipated to access the site via Waratah Street, while only a 1-2 students will access the site via Wharf Road / Mary Street.

It is important to note, this analysis is indicative, and travel habits may vary in practice. It is understood bicycle demand may be higher on Wharf Road given there is also bicycle storage at the main access.

6.3.2 Bicycle Facilities

Reference is made to the Parramatta DCP 2023, Part 8.2.6.4.3 – Melrose Park Urban Precinct which does not stipulate any bicycle parking rates for students and staff for educational establishments but mentions that *"Secure bicycle parking facilities are to be provided in accordance with Council's Bike Plan".*

CoP Draft Bike Plan 2023 does not stipulate any specific bicycle parking provision and therefore reference was made to the Parramatta DCP– Part 6.3 for bicycle parking rates. The bicycle parking rates are shown below in Table 25. Note there is no bicycle parking rate provided for preschools.

Table 25: Bicycle Parking Rates as per Parramatta DCP Part 6.3
Source: Parramatta DCP Part 6

	Number	DCP Rates	DCP Requirements	Proposed Provision
Students	720	1 space per 10 students over year 4*	12	50
Staff	55	1 space per 10 staff	6	8
Total			**18**	**58**

** Assuming year groups are equally numbered*

As shown in Table 25, the Parramatta DCP– Part 6.3 requires a total of 18 bicycle parking spaces, which includes 12 bicycle parking spaces for students and 6 bicycle parking spaces for staff. The proposed site will provide a total of 58 bicycle parking spaces, comprising of 50 students and 8 staff bicycle spaces and therefore is considered acceptable. This provision is also sufficient to support the moderate mode share scenario.

In addition, to promote sustainable transport and meet the reach scenario target of 20% of students cycling. The proposal will also include space set aside for future installation of additional bicycle parking spaces as the mode share increases towards the reach scenario (20%, or ~200 spaces).

6.3.3 End-of-Trip Facilities

Reference is made to the Melrose Park DCP Part 8.2.6.4.3, which stipulates end-of-trip facilities for non-residential developments as per the rates shown in Table 26.

Table 26: End-of-Trip Facility Rates as per Parramatta DCP Part 8
Source: Parramatta DCP Part 8

	Proposed Bike Spaces	DCP Rates	DCP Requirements	EOTF Provision
Students	50 spaces	▪ 1 locker per bicycle space ▪ 1 shower & change cubicle for up to 10 bicycle spaces ▪ Shower & change cubicles for 11 to 20 or more bicycle spaces ▪ Additional shower & change cubicles for each additional 20 bicycle spaces or part thereof	▪ 50 lockers ▪ 4 shower & change cubicles	No EOTF for students
Staff	8 spaces		▪ 8 lockers ▪ 1 shower & change cubicle	2 unisex shower / change facilities, including 10 lockers

As shown in Table 26, the proposal is required to provide a minimum of 5 unisex showers / change cubicles and 58 lockers in accordance with Parramatta DCP. Given the proposal is for a primary school, it is considered that these EOTF rates are excessive, particularly noting that students do not have the ability to shower in school after arriving to the school. The proposed staff EOTF provisions meet the requirements of the Parramatta DCP and are therefore considered acceptable.

Reference is also made to the *Green Star Buildings Submission Guidelines*, which contains the rates shown in Table 27.

Table 27: End-of-Trip Facility Rates as per Green Star Requirements
Source: Green Star Buildings Submission Guidelines

	Green Star Rates	Green Star Provisions
Students	▪ 2 showers for a staffing body of 68 ▪ 1 locker per 8 staff	▪ No rates for students
Staff		▪ 2 showers ▪ 9 lockers

As shown in Table 27, the proposed provision of 2 showers / change and 10 lockers at the MPPS as well as 1 shower / change at the preschool meets the Green Star requirements. Therefore, the proposed number of end-of-trip facilities for staff is adequate to support the forecast demand and meet the Green Star and DCP requirements.

6.4 Design

Student bicycle parking has been designed for convenience to be distributed across the campus at two locations near the east and west site access points.

The staff bicycle parking spaces are located adjacent to Building B1, near to the main entry point on Wharf Road and close to the shower and change facilities for convenience.

Bicycle storage shall be designed in accordance with AS2890.3.

Section 7 Public Transport

7.1 Demands

Future public transport (bus, train or light rail) volumes have been calculated for the proposed travel mode splits above in Section 4.3, and are summarised in Table 28 for each scenario.

Table 28: Summary of Public Transport Travel Demands

Public Transport	Mode Split				Travel Demand		
Scenario	Baseline	Moderate	Reach	No.	Baseline	Moderate	Reach
Students	1%	0%	0%	Students	7	0	0
Staff	0%	15%	30%	Staff	0	8	17

This traffic assessment considers the scenario which results in the largest travel demand as the most conservative approach. As highlighted in Table 28, this scenario would be the student numbers with the baseline mode split applied, and the staff numbers with the reach mode splits applied.

The usage of public transport for students travelling to school is expected to be minimal due to the low baseline mode split of 1%, and the proposed reduction in catchment area size. Therefore, the future mode share scenarios show zero usage of public transport for students.

7.2 Proposal

The proposed upgrade does not include plans to modify the existing public transport network. The existing bus zones on Hope Street and Wharf Road will continue their existing operation upon project completion.

7.3 Analysis

For students, due to the low travel demands forecast for the project, the current bus routes servicing the site will be sufficient in supporting the demand. Therefore, no additional school bus provisions or other public transport services are included in this proposal. For staff, it is expected that up to approximately 17 staff members across the primary school and preschool may travel by public transport (combination of bus, train and future light rail) as the reach travel mode scenario is achieved over time. Due to the relatively low demand numbers, it is expected that the existing and proposed future public transport services (described further below) will adequately support the school demands.

In parallel to the growth of the school population, it is understood, as part of the TMAP trigger points it is intended more frequent bus services will be implemented by TfNSW to facilitate the service needs of the growing Melrose Park population. Particularly as the town centre is anticipated to be completed by opening year of the MPPS redevelopment and it is understood more frequent bus services will be implemented within the vicinity of the site.

As detailed in Section 2.5.5, the proposed PLR Stage 2 will include a stop along Hope Street located approximately 200 metres to the west of the site, as well as a stop on Waratah Street located approximately 300 metres south of the site. The proximity of the light rail means that travel by light rail is an attractive and accessible option for those travelling to and from MPPS. Currently, no specific information is available on when the light rail will be in operation. However, discussions with TfNSW have confirmed Stage 1 early works have already begun for the construction of the bridge over Parramatta River. Stage 2 is intended to start construction in 2028-2029 with an anticipated completion date of 2032. Therefore, it is expected that the light rail will be in operation after the opening of the school.

Section 8 Servicing and Waste Collection

8.1 Proposal

The loading dock for service vehicles and waste collection is within the preschool car park, located at the southeast corner of the site. The loading dock is designed to accommodate vehicles up to and including a 10.8m waste truck. Figure 42 shows the proposed design for the loading dock.

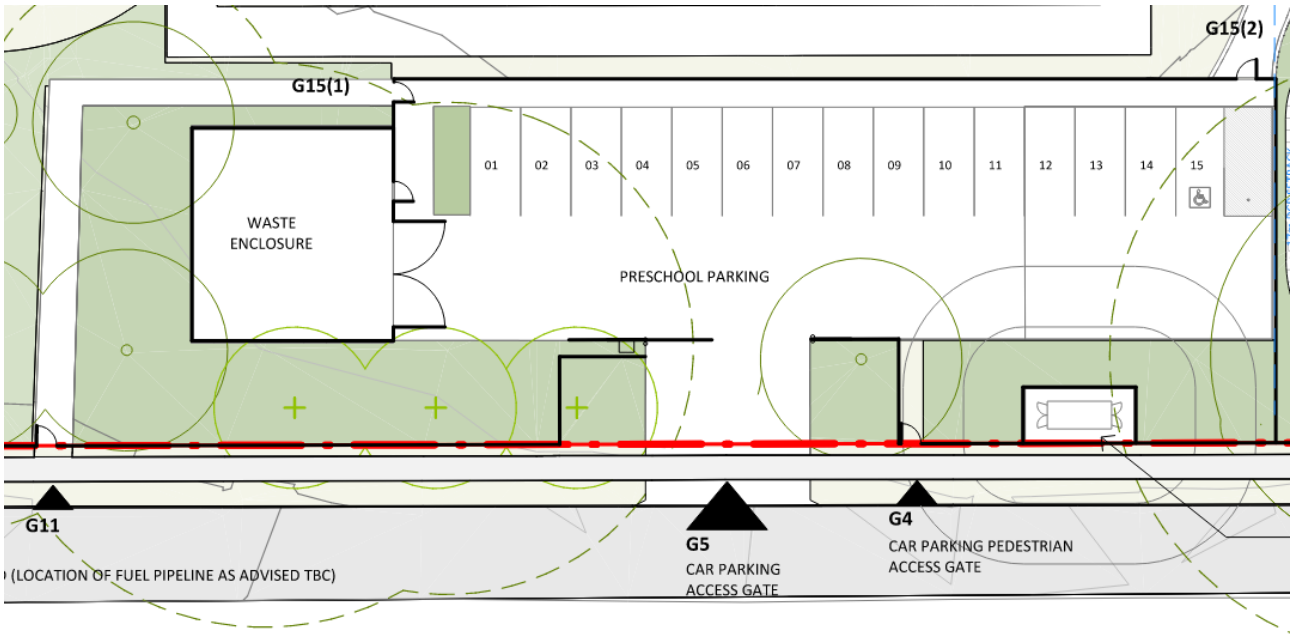


Figure 42: Loading Dock for Deliveries and Waste Collection
Source: PTW (MPPS-PTW-ZZ-GF-DR-A-020004 [T0])

The proposed gate will be setback 6 metres from the property boundary, allowing all cars to site wholly within the site. However, this will result in some overhang of the footpath by service vehicles. The roadway will not be obstructed, and it is intended deliveries and waste collection will occur outside peak times having a negligible impact on pedestrian and vehicle movements.

8.1.1 Emergency Vehicles

There is no dedicated parking areas provided for emergency vehicles, however depending on the nature of the emergency there would be options for vehicles to stop in either of the kiss & ride zones, the staff car park, the preschool car park or the loading dock.

It is anticipated that emergency vehicles will likely utilise roadways near the east corner of the site (pending real-time traffic conditions) due to the fire booster location near the main entry.

There is approximately 20m between the Wharf Road crossing and the proposed accessible kiss & ride zone which could be utilised by a fire truck during an emergency. This would provide access to the fire booster located near the main entry.

8.2 Analysis

Part 8 of the Parramatta DCP 2023 nor the general requirements of the Parramatta DCP stipulate a service vehicle parking rate for education establishments. Therefore, a first principles analysis was completed to confirm the on-site loading and servicing provisions. Information provided by SINSW on similar scale projects and input from the waste consultant confirmed the largest truck to service the site would be a 10.8 metre waste truck.

Servicing of the site will also be facilitated on-site within the dedicated loading dock. Given the moderate scale of MPPS, it is not expected that it would generate demand for vehicles larger than an 8.8m medium rigid vehicle (MRV). Waste collection and deliveries will be scheduled to ensure there is no overlap with deliver / waste collection vehicles.

As outlined above, the proposed loading dock accommodates vehicles up to and including a 10.8m waste truck while the preschool pick-up and drop-off parking spaces are empty (i.e. outside of peak morning and evening periods). Swept path analysis for the loading dock and service vehicle area is provided in Appendix A.

Section 9 Kiss & Ride

9.1 Demands

Future primary school kiss & ride volumes have been calculated for the proposed student travel mode splits above in Section 4.3, and are summarised in Table 29 for each scenario. This assessment has not taken into consideration vehicles associated with the preschool as it is intended these vehicles will utilise the dedicated preschool car park. Further details associated with the preschool vehicle demands are provided in Section 10.4.

Table 29: Summary of Kiss & Ride Travel Demands

Kiss & Ride	Mode Split				Travel Demand		
Scenario	**Baseline**	**Moderate**	**Reach**	**No.**	**Baseline**	**Moderate**	**Reach**
Students	77%	50%	5%	**Students**	554	360	36

It is acknowledged that the scenario resulting in the largest travel demand would student numbers with the baseline mode splits applied i.e. applying the maximum student capacity of 720 students to the existing student car travel demand of 77%, resulting in a demand of 554 students travelling to / from school by car.

However, as noted in Section 4.3, it is understood the likelihood of 77% of students travelling to / from the site by car is extremely unlikely for the following reasons:

- 40% of existing students live within 800m (10-minute) walk of the site, while the remaining 60% of existing students currently live outside 800m (10-minute) walk of the site. The baseline travel mode surveys showed 77% of students currently travel to / from school by car.
- The proposed reduction in catchment size results in **100% of students** living within 800m (10-minute) walk of the site, when compared to existing student locations this is an increase of 60% of students living close to school. It is understood this will result in a significant reduction in car travel and a higher uptake of active travel demands given all students will live within a 10-minute walk of the site.
- Improved infrastructure, including dedicated cycle paths, shared paths, footpaths and crossings will be delivered as part of the Melrose Park Precinct development (refer to Figure 16 for reference). This will encourage students to walk and cycle to / from the site.

It is understood there will be a transitional period where students who currently live within the existing catchment but outside the proposed catchment (61%) will still attend MPPS. To complete a conservative assessment the moderate travel mode splits (360 students) have been adopted in this kiss & ride analysis, which have been designed to take into consideration the transition period from the existing school population and existing catchment boundary to the proposed future scenario are adopted to understand student kiss & ride travel demands.

9.2 Proposal

The proposed kiss & ride zones are shown in Figure 43 and the key features of each zone are summarised in Table 30. The school will consist of two kiss & ride zones, including an extension of the existing zone on Wharf Road as well as the proposed new kiss & ride zone on Mary Street. The existing 15-minute parking zone on Waratah Street will be retained, but ultimately will be removed following the PLR Stage 2 construction.

In addition, an accessible kiss & ride zone is located on Wharf Road to the northeast corner of the site, with an approximate length of 32m (or capacity for 4 accessible on-street bays). Table 30, provides a summary of the proposed kiss & ride zone, which are also illustrated in Figure 43.

Table 30: Summary of Kiss & Ride Zones

	Wharf Road	Mary Street
K&R Length	42m	78m
Capacity	7 cars	13 cars
Accessible K&R Length	32m	N/A
Capacity	4 cars	N/A

It is noteworthy to mention, the exact length of all zones may vary in the detailed design phase, as the installation of new signage restrictions for these zones will be subject to separate approvals through Council's Local Traffic Committee.

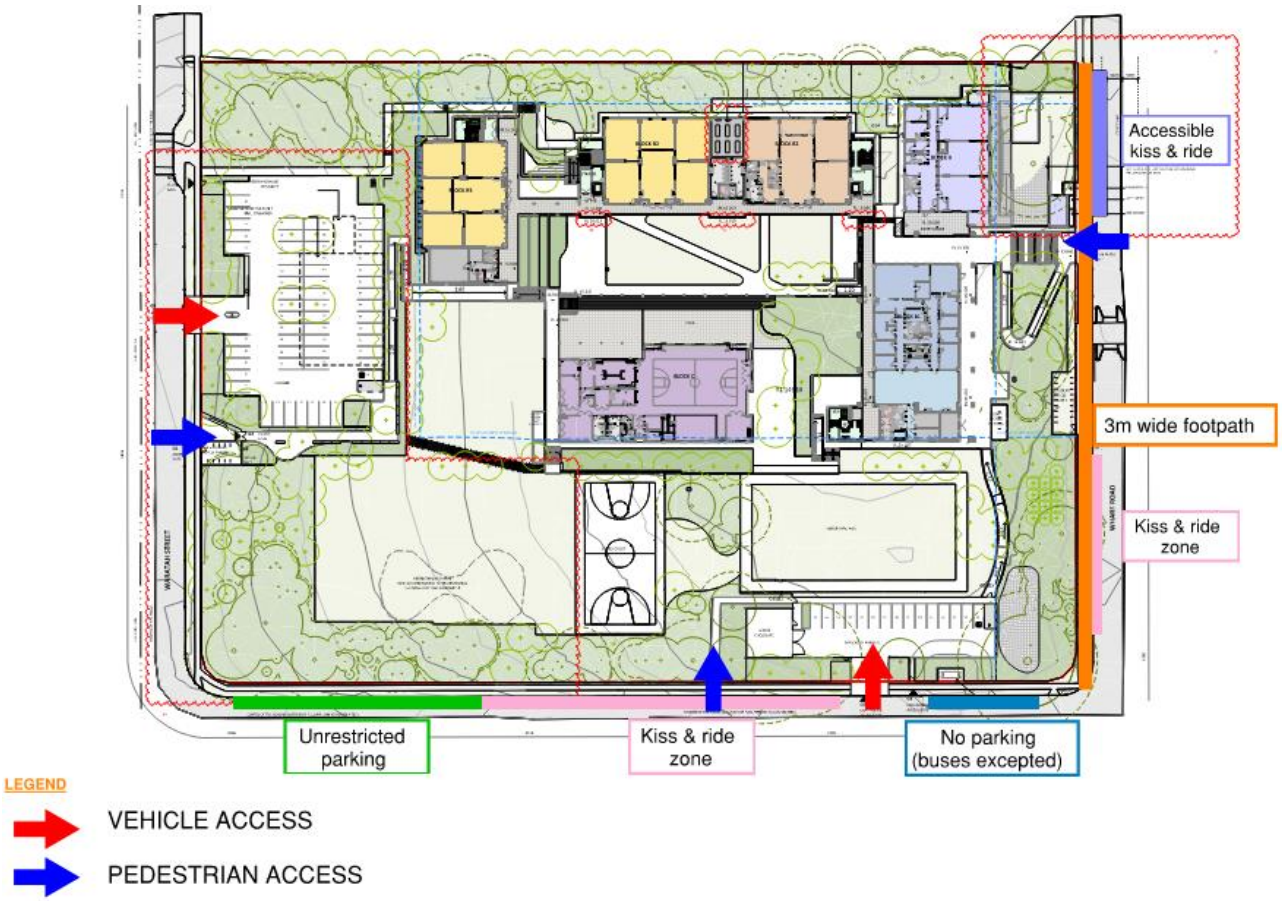


Figure 43: Proposed Kiss & Ride Zones
Source: Modified from PTW (MPPS-PTW-ZZ-GF-DR-A-020004 [T2])

9.3 Queueing Analysis

To provide an assessment an understanding of anticipated queuing during school peak periods a queuing analysis has been completed. Table 30 outlines the forecast vehicle demands at each of the kiss & ride zones, and the anticipated arrival rate during the peak period. The values listed may vary in operation, based on the actual turnover time of individual vehicles, and the initiatives in the operational School Transport Plan that will be implemented to ensure reasonable operation of the kiss & ride facilities.

The following key assumptions have been adopted in the queueing analysis:

- Each kiss & ride bay has a turnover rate of 60 seconds per vehicle.
- The larger kiss & ride zone (Mary Street) will operate and be managed in groups of 6 to accommodate 6 vehicles per 60 seconds.
    - i.e. a processing rate of 6 vehicles per minute
- The smaller kiss & ride zone (Wharf Road) will operate and be managed in groups of 4 to accommodate 4 vehicles per 60 seconds.
    - i.e. a processing rate of 4 vehicles per minute
- Each kiss & ride bay would be 6m in length
- 80% of kiss & ride activity would occur over a peak period of 20 minutes
- 85% of kiss & ride activity would occur within the formal kiss & ride zones
- 60% of kiss & ride activity would occur within the larger kiss & ride zone (Mary Street), with the remaining 40% occurring within the smaller kiss & ride zone (Wharf Road).

9.3.1 Queuing Analysis

Table 31: Kiss & Ride Queueing Analysis

Parameter	Wharf Road	Mary Street
Forecast demand	360 vehicles (as per Table 29)	
Vehicle occupancy[1]	1.5 students per vehicle	
Portion travelling within peak	80%	
Portion using formal zone	85%	
Activity at each zone	40%	60%
Vehicles at each zone	65	98
Peak duration	20 minutes	20 minutes
Peak vehicle arrival rate	**3.3 vehicles per minute**	**4.9 vehicles per minute**
Processing rate	4 vehicles per minute	6 vehicles per minute

As outlined in Table 31, the peak arrival rate is lower than the processing rate (4.9 veh/min vs 6.0 veh/min for the Mary Street zone, and 3.3 veh/min vs 4.0 veh/min for the Wharf Road zone). Therefore, the capacity of the proposed kiss & ride zones is sufficient to fully accommodate the forecast demands, with no queueing past the kiss & ride zone and no impact to traffic flows in the public roadway.

[1] Vehicle occupancy is calculated as per the student travel mode surveys

In summary, the queuing assessment shows the proposed dedicated kiss & ride zones will operate satisfactorily with no adverse queuing. The proposed kiss & ride zones are therefore considered acceptable.

9.4 Design

9.4.1 General Usage Kiss & Ride Zone

The kiss & ride zones on Wharf Road and Mary Street are proposed to utilise the existing kerbside lanes. Therefore, each of the zones will continue to operate generally in accordance with the existing conditions. It is noted that the Mary Street kerbside lane will be subject to signage changes to install a new kiss & ride zone, but the kerbs and lane configurations will be as per existing conditions.

9.4.2 Accessible Kiss & Ride Zone

The accessible kiss & ride zone has been designed in accordance with AS2890.5 and AS2890.6 at a width of 3.2m, higher than the standard minimum width of 2.0m for kerbside parking (as per AS2890.5). AS2890.5 is a specific design document for on-street parking facilities and includes this guidance for accessible parking design, which is a typical type of on-street parking configuration.

Figure 44 provides the design guidance given in the Australian Standards for these facilities. Final arrangements for signage and line marking of these bays will be subject to future coordination with, and approval by, Council's Local Traffic Committee.

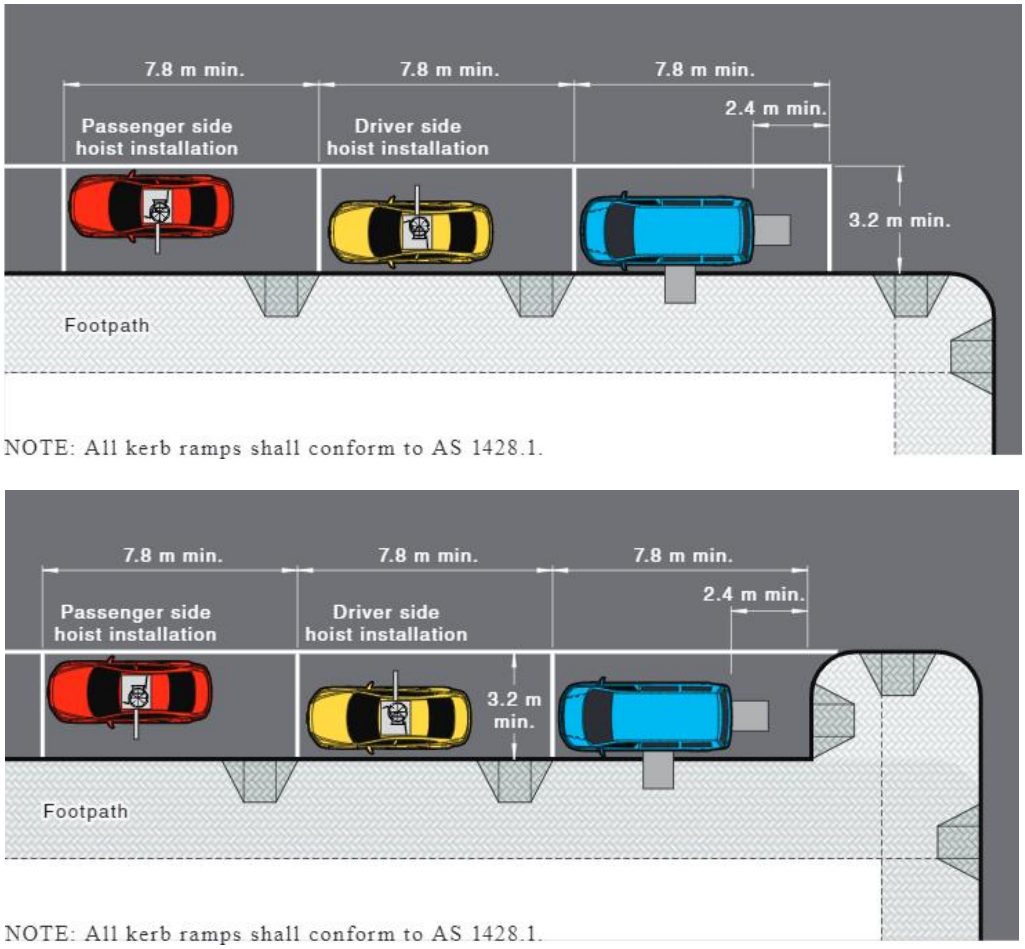


Figure 44: Compliant Design Options for Accessible Parallel Parking Bays (On-Street)
Source: Australian Standards AS2890.5

Section 10 Car Parking

10.1 Demands

Future staff car parking volumes have been calculated for the proposed primary school and preschool staff travel mode splits above in Section 4.3, and are summarised in Table 32 for each scenario. It is noteworthy to mention, no on-site parking will be provided for primary school students or parents, these demands will be catered for within the dedicated on-street kiss & ride zone and have been assessed above in Section 9.

Table 32: Summary of Primary School Staff Car Parking Demands

Car Parking	Mode Split				Travel Demand		
Scenario	**Baseline**	**Moderate**	**Reach**	**No.**	**Baseline**	**Moderate**	**Reach**
Primary School Staff	84%	75%	50%	**Primary**	42	38	25
Preschool Staff				**Preschool**	4	4	3

It is acknowledged that the scenario resulting in the largest travel demand would be staff numbers with the baseline mode splits applied, resulting in a demand for 42 primary school staff and 4 preschool staff car parking spaces.

As further detailed in the following sections, due to, a combination of site constraints and provision of alternative travel measures, it is reasonable to adopt and provide a car parking provision for the forecasted reach target car travel mode of 50% for staff. Refer to Section 10.3 for a detailed assessment of the parking provision and its adequacy.

10.2 Proposal

The project will provide 2 on-site car parks with the following arrangements:

- MPPS preschool car park, accessed via Mary Street
  - 15 car spaces
- MPPS staff car park, accessed via Waratah Street
  - 57 car spaces

It should be noted, whilst the MPHS project is subject to a separate REF approval, where a separate parking provision analysis has been undertaken as part of the *Melrose Park High School – Transport and Accessibility Impact Assessment* (MPHS TAIA) by TTW, dated *2025 (Ref: TAIA, Rev 1, TTW 28/01/2025).*

Figure 45 & Figure 46 show the proposed car park layouts, while a breakdown of the car parking allocation is provided in Section 10.2.1 and Section 10.2.2.

10.2.1 MPPS & MPHS Staff Car Park

As previously mentioned, the proposed car park will cater for MPPS & MPHS staff. Table 33 provides a summary of the proposed staff parking provision.

Table 33: Proposed Staff Parking Provision & Location

Car Park	MPPS	MPHS	Total
Waratah St	33 car spaces	24 car spaces	**57 car spaces**

As shown above in Table 33, a total of 57 car parking spaces will be provided. Of these, 33 car spaces, including 1 accessible space will be designated to MPPS staff. Figure 45 shows the proposed car parking arrangement.

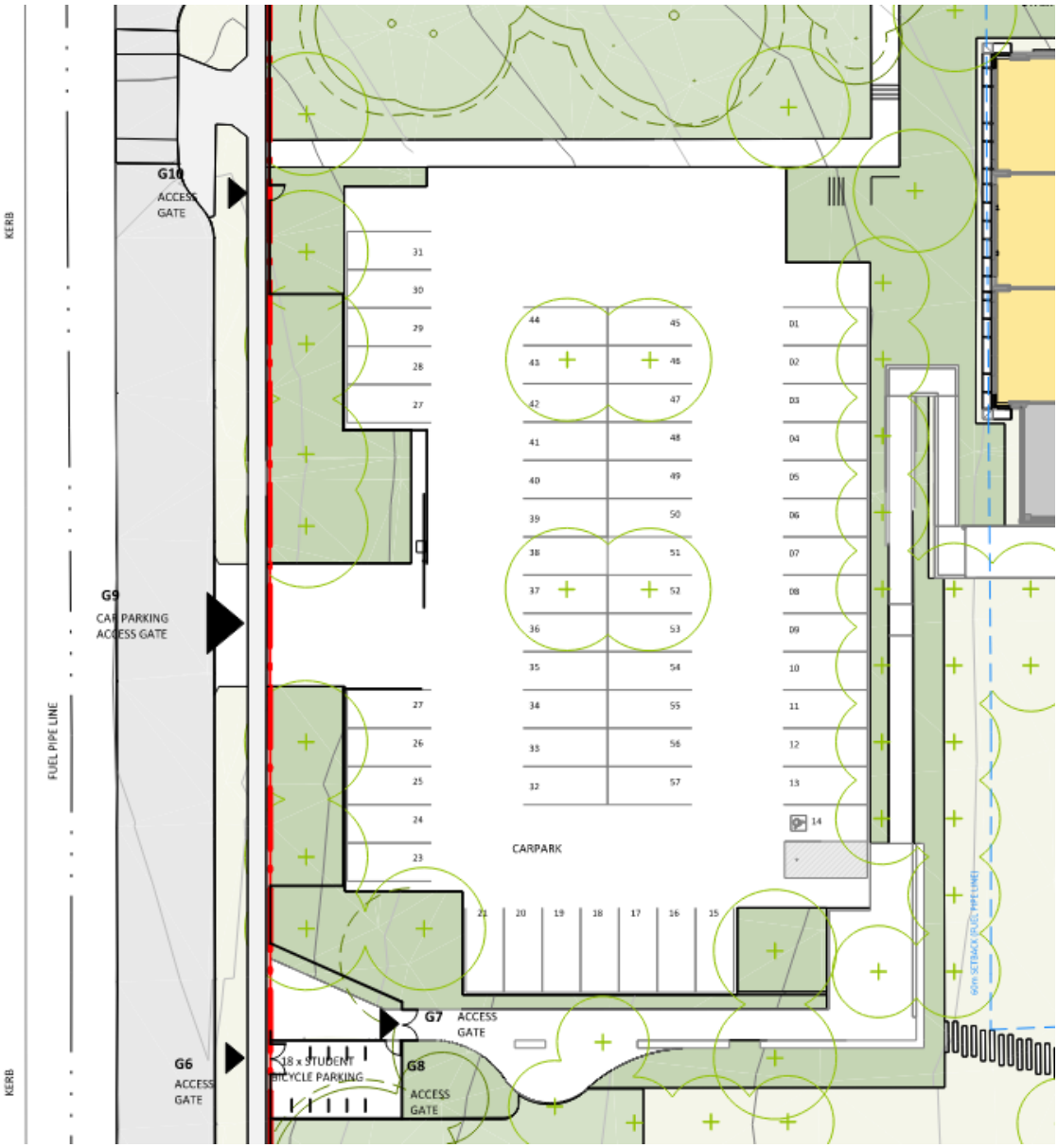


Figure 45: Proposed Staff Car Park
Source: PTW

10.2.2 Preschool Car Park

The proposed on-site preschool car park is accessible via a driveway at Mary Street on the south side of the site. The preschool car park will provide a total of **15 car parking spaces** including 1 accessible space. 4 spaces will be dedicated to preschool staff, while the the remaining 11 will be for short-term pick up and drop off for parents and carers. Both the staff and short-term pick-up and drop-off spaces will be marked and signposted on site. The layout of the proposed preschool car park is illustrated in Figure 46.

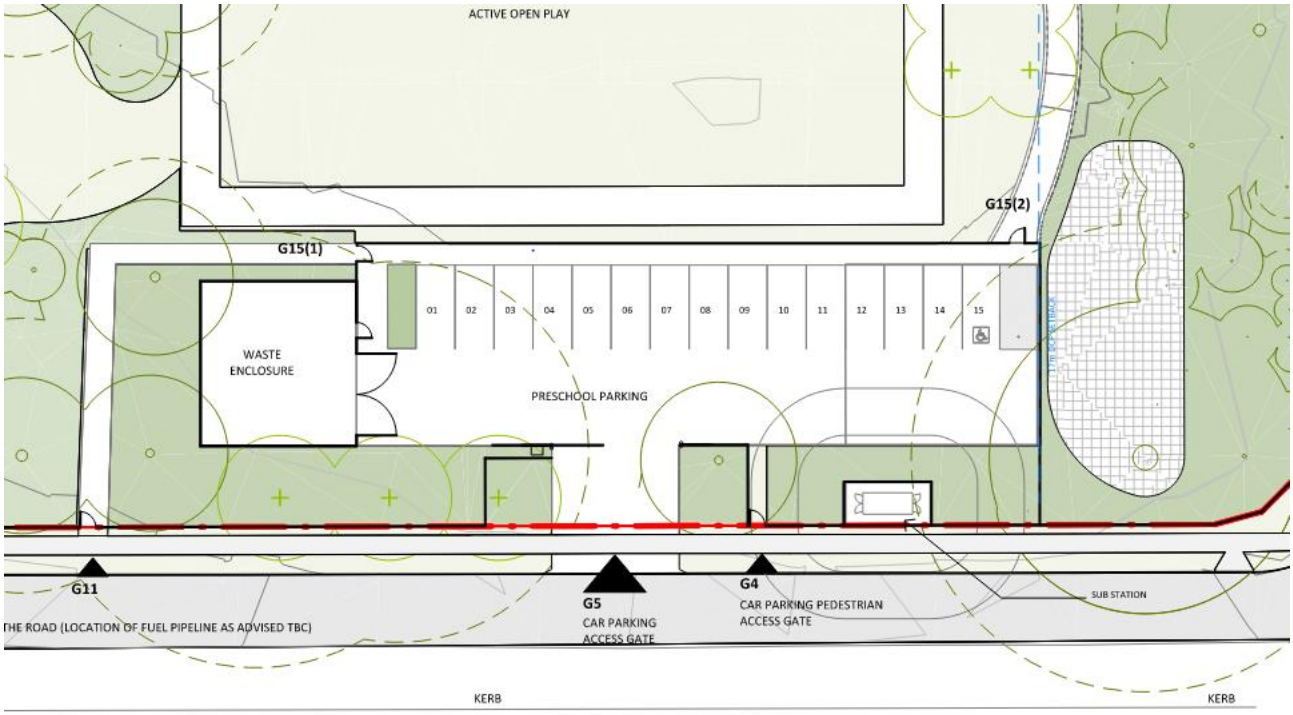


Figure 46: Proposed Preschool Car Park
Source: PTW

10.3 Analysis – Primary School

In order to determine an appropriate level of parking at MPPS, a number of assessments were completed including, review of Parramatta DCP, a review of other DCP parking rates, a comparison between the baseline and proposed parking provision and a site-specific analysis which developed baseline, moderate and reach travel mode targets. Consultation with TfNSW and Council was also completed during the TWG meeting stream. Details are provided in the following sections.

10.3.1 Parramatta DCP Car Parking

Reference is made to Parramatta DCP Part 8, which stipulates car parking requirements for centres, precincts and specific sites. Section 8.2.6.4.2 details the following in relation to parking within the Melrose Park Precinct.

> ***8.2.6 Melrose Park Urban Renewal Precinct***
>
> *8.2.6.4.2 On-Site Parking*
>
> *Controls*
>
> ***C.01** Car parking rates for Melrose Park are as per the rates identified in Table 6.2.1 of the Parramatta DCP 2023. While these rates in the table refer to minimums, these rates are to be applied as maximum rates in Melrose Park and should not be exceeded.*

Table 6.2.1 of the Parramatta DCP 2023 does not provide specific parking rates for schools but does outline the following requirement in relation to educational establishments:

> *"Required parking to be confirmed through a traffic and transport impact assessment. The assessment must demonstrate the development will not result in any adverse impacts on on-street parking in surrounding residential areas."*

10.3.2 Comparable DCP Parking Rates

Table 34 provides a summary of parking rate requirements in other DCPs throughout metropolitan Sydney to provide a comparison of educational establishment parking rates.

Table 34: Comparable DCP Parking Rate Requirements

DCP Reference	DCP Rate	MPPS Max Capacity	Parking Space Requirement
Ryde DCP 2014	1 space per 2 staff members	50 staff & 720 students	25 spaces
Marrickville DCP 2011	1 space per 2 – 5 staff members (depending on locations)		11 – 25 spaces
Willoughby DCP 2016	1 space per 2 staff members		25 spaces
Cumberland DCP 2021	1 space per 20 year 12 students + 1 space per 1 staff plus 1 visitor parking space per 100 students		57 spaces (50 staff + 7 visitor spaces)
Fairfield CityWide DCP 2024	1 space per employee plus 1 space per 10 students in Year 12 (where applicable)		50 spaces

Table 34 indicates that there are several LGAs within relatively close proximity to the site which provide a parking rate of 1 space per 2 staff for schools. These LGAs are similar in nature to the proposed Melrose Park Precinct, located in built up areas typically located in proximity to frequent public transport services. Table 34 also notes there are a few surrounding LGAs that require a car parking rate of 1 space per 1 staff, however it is understood these LGAs are more car dependant and are not relevant to adopt in relation to the proposed Melrose Park Precinct and specifically the MPPS site.

In reference to the proposed MPPS which proposes a maximum capacity of 50 staff, adopting the 1 space per 2 staff parking rate, would equate to a requirement of 25 parking spaces. A total provision of 33 staff car parking spaces will be provided for MPPS and is therefore typically aligned with other LGAs with similar characteristics to the proposed Melrose Park Precinct and is considered supportable.

10.3.3 Comparison between Existing and Proposed Parking Provision

Given the site currently has an existing on-site staff car park, it is important to provide a comparison between the existing and proposed parking provision in relation to the existing demand. Table 35 provides a comparison of the existing and proposed parking provision adopting the existing staff car travel mode split as a conservative measure.

Table 35: Existing & Proposed Opening Year Parking Provision

	Staff No.	Existing Staff Car Mode Split	Demand	Car Park Provision	Deficiency
Existing	22	84%	18 car spaces	12 car spaces	-6
Proposed	50		42 car spaces	33 car spaces	-9

As shown above in Table 35, the existing car park currently provides a total of 12 parking spaces with a current demand of 18 parking spaces, noting that currently 6 staff do not have availability to park on-site.

MPPS will provide 33 car parking spaces, if the existing car mode share is applied, a demand of 42 parking spaces is required, meaning 9 staff would be unable to park on-site.

The proposal intends to ensure the staff car mode share splits are reduced from 84% to 75% moderate target and 50% reach target to ensure **all staff can park on-site**. A reduction in private car demand will be achieved through the following measures:

- As discussed at length in Section 4.3 and throughout this document, the project is seeking to use the opportunities presented by the redevelopment to improve the existing targets for travel behaviour which differs from the existing school. In order to avoid generating high levels of additional vehicular traffic through induced demand, transport provisions and capacity (including car parking provision) are specifically targeted to achieve a mode shift away from private vehicle usage.
- An uptake in public transport usage by staff is expected as the Melrose Park Precinct is developed and the future PLR Stage 2.
  - The Melrose Park Precinct developers are currently chartering a private shuttle bus during morning and afternoon peak periods to transport residents and employees between Melrose Park and Meadowbank wharf and train station. The frequency of this service is intended to increase to 12 services during peak hours by 2027 (opening year of MPPS upgrade). It is intended more frequent bus services provided by TfNSW will be implemented to facilitate service needs of the growing Melrose Park population, which will provide additional public transport options for staff travelling to / from the site.
  - Additionally, major public transport infrastructure works are being completed as part of the PLR Stage 2, which will directly connect staff travelling to MPPS to the cores of the Eastern and Central CBD's, enhancing accessibility and reducing travel times. This significant public transport link is expected to be available before MPPS by 2032.

- The proposed end-of-trip facilities provide storage for bicycles as well as lockers, showers and change facilities. This ensures that active transport is a good and accessible option for staff and assists in reducing travel by car. The bicycle storage area is adjacent to staff shower and change facilities, providing an excellent level of amenity.
- Walking and cycling travel to and from the school will be supported by the improvements to active travel facilities, including the proposed footpath widening along Wharf Road and on-site bicycle parking and end-of-trip facilities, as well as projects by others including the Active Transport Link along the PLR Stage 2 corridor on Waratah Street, the approved Wharf Road Linear Park as well as the pedestrian and cyclist path network and new crossings currently under construction as part of the Melrose Park North development.
- The Department of Education is currently reviewing and considering options for local staff recruitment, i.e. encouraging employment of staff who live in close proximity to the site. All recruitment will continue to be decided on a merit basis, with proximity to site being just one element in the recruitment process. Higher numbers of staff living close to the site, compared to other typical schools, will allow the walking and cyclist mode shares to be increased.
- In a case where the target mode split is not fully achieved, the worst-case primary school staff car parking demand would be 42 vehicles (as per baseline mode split of 84%). Considering the on-site capacity of 33 spaces, this scenario would result in a maximum of 9 cars overflowing into the surrounding streets. Whilst car usage is discouraged, if the demand exceeded the capacity available in the on-site car park, there is available on-street parking in the surrounding streets (refer to Section 2.7.1) which may be utilised in the interim until the Melrose Park Precinct is fully developed, following which there will be sufficient levels of public transport to accommodate staff travelling to site via non-car travel modes.

It is acknowledged that the target mode splits are ambitious and depart reasonably significantly from the average and baseline scenarios. However, as mentioned, the mode splits are considered achievable due to the considerations listed above. Further to this, it is important to note that the targets are not expected to be achieved in the opening year of the school, but rather reached over time as the school grows. The 'reach' travel mode targets have been discussed with SINSW, and well as Council and TfNSW and the approach is supported.

10.3.4 Site Specific Parking Assessment

Following the above assessments and consultation with Council and TfNSW, the below parking rates were considered appropriate. Table 36 provides details of the proposed parking rate and provision in response.

Table 36: Proposed Staff Parking Provision & Location

	Staff No.	Parking Rate	Parking Requirement	Proposed Parking Provision
Proposed	50	1 car spaces per 1.5 staff	33	**33 car spaces**

As shown in Table 36 applying a parking rate of 1 car space per 1.5 staff, results in the requirement for 33 car parking spaces.

10.4 Analysis – Preschool

10.4.1 Parramatta DCP Car Parking

Reference is made to Parramatta DCP Part 8, which stipulates car parking requirements for centres, precincts and specific sites. Section 8.2.6.4.2 details the following in relation to parking within the Melrose Park Precinct.

> ***8.2.6 Melrose Park Urban Renewal Precinct***
>
> *8.2.6.4.2 On-Site Parking*
>
> *Controls*
>
> ***C.01** Car parking rates for Melrose Park are as per the rates identified in Table 6.2.1 of the Parramatta DCP 2023. While these rates in the table refer to minimums, these rates are to be applied as maximum rates in Melrose Park and should not be exceeded.*

For childcare centres, Table 6.2.1 of the Parramatta DCP provides parking rates, these are detailed below including the proposed provision in Table 37.

Table 37: Car Parking Requirements & Provision

Land use	No.	DCP Parking Rate	DCP Requirement	Proposed Provision
Children	60	1 space / 4 children in attendance	15	15

Note: As per Clause 8.2.6 of Parramatta DCP parking rates are considered maximum

As shown in Table 37 the preschool is required to provide a maximum of 15 car parking spaces. The DCP does not detail allocation of these parking spaces. The proposal provides 15 car parking spaces, 4 would be allocated to staff and 11 would be allocated to pick-up and drop-off activities. It is noted that the anticipated demand for car parking by preschool staff is a worst-case maximum of 4 (as per baseline mode splits, with no consideration of progress towards the reach mode split scenario). Therefore, the proposed preschool car park is adequate to support the anticipated demand and complies with the requirements of the Parramatta DCP.

10.5 Adequacy of Proposal

10.5.1 Primary School

In terms of the primary school staff car park, it is noted that Parramatta DCP does not contain specific parking rates for schools. Therefore, reference to comparable DCPs is made, which as described above, shows that several LGAs within relatively close proximity to the site provide a parking rate of 1 space per 2 staff for schools. Adopting this 1 space per 2 staff rate to the proposed staffing number of maximum 50 results in a requirement for 25 parking spaces. Therefore, the proposed parking provision of 33 primary school staff car parking spaces is typically aligned with other LGAs with similar characteristics to the proposed Melrose Park Precinct and is considered supportable.

Furthermore, the existing MPPS operates with 1 space per 1.8 staff members, or for 55% of staff (i.e. 12 spaces for 22 staff members). The proposed new school staff car park would improve this, by providing 1 space per 1.5 staff members, or for 66% of staff. The proposed primary school staff parking provision is therefore considered acceptable.

10.5.2 Preschool School

In relation to the preschool, compliance has been achieved in accordance with Table 6.2.1 of the Parramatta DCP. In addition, Section 8.2.6.4.2 stipulates these parking rates should be as maximum rates in Melrose Park and should not be exceeded.

The proposed preschool parking provision is therefore considered acceptable.

10.6 Accessible Parking

The Building Code of Australia (BCA) defines accessible parking requirements as a portion of total capacity depending on the land use. The BCA Assessment Report prepared by City Plan (Revision 02, dated 10/01/25) defines the proposal as a mixture of Class 5 and Class 9b facilities. In accordance with Section D4D6 of the BCA, accessible parking for each of these classifications is required at a rate of 1 space for every 100 car parking spaces or part thereof (1%). The development is required to provide a minimum of 1 accessible parking spaces.

The proposed design provides 2 accessible spaces, one in each of the separate car parks. Therefore, the proposal complies with the BCA.

There is also a proposed provision of accessible kiss & ride bays, as detailed in Section 9.4.2, which will be designed in accordance with AS2890.5 and AS2890.6.

10.7 Design

Car parking is to be provided in accordance with AS2890.1:2004. Key design parameters for 90-degree angled parking include:

- Classification: Class 1 (all-day employee parking) or higher
  - *Note: Higher classes are typically required for higher turnover usage (i.e. the preschool car park)*
- Parking space width: 2.4 metres or higher
- Aisle width: 6.2 metres (or as required by class)
- Parking space length: 5.4 metres
- Gradient: 1:20 (5%) maximum

Swept path analysis for the car park and vehicle access point is provided in Appendix A.

10.8 Operation

Both proposed car parks would be controlled by a sliding gate and intercom at the entry point to act as the out-of-hours secure perimeter. It is expected that the sliding gates would remain in an open position during the peak morning and afternoon periods to allow efficient movements in and out, with minimal impact to traffic flows on public roads, particularly during drop-off and pick-up activity at the preschool car parks.

10.9 Car Parking Mitigation Measures

In order to achieve a reduction in car travel, compared to existing conditions and working towards an ultimate 50% car mode split the following mitigation measures will be considered:

- Subject to future arrangements by SINSW, a Travel Coordinator may be appointed for the site. This role's responsibility will be to further encourage sustainable transport measures (including the actions listed below), plus undertake all other elements of this STP
- Implementation of a site specific STP which details transport encouragement programs and activities to reduce car travel and encourage active and public transport, measures include but are not limited to:
  - New starter kits, to make students and staff aware of available travel options
  - Implementation of a Travel Access Guide (TAG) providing information on available transport options
  - School initiatives i.e. school walking bus and ride to school week
- Both the preschool and primary school staff car parks are required to be designed in accordance with AS 2890.1. Updates to the car parks shown on the attached REF plans will be required to meet these requirements.

Further details are also outlined in the preliminary STP and will be updated once the school is operational.

Section 11 Traffic Impacts

11.1 Traffic Generation

11.1.1 Primary School Vehicle Volumes

Future travel demands for car usage for primary school students have been calculated in Section 4.3 and are summarised in Table 38. As shown in the following tables, a vehicle occupancy rate has been applied, which has been calculated based on the results of the baseline travel mode surveys undertaken at the school (refer to Section 2.8). The resulting existing and proposed vehicle volumes are shown below, a sensitivity test has also been completed to show vehicle volumes for a larger student population of 982 students.

Table 38: Summary of Student Vehicle Volumes

Traffic generation	Baseline			Moderate		Reach	
	Baseline	Proposed	Sensitivity	Proposed	Sensitivity	Proposed	Sensitivity
Student number	185	720	982	720	982	720	982
Mode split	77%	77%	77%	50%	50%	5%	5%
Car demand	142	554	756	360	491	36	49
Students per car	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Vehicle volume	95	370	504	240	327	24	33
Change from existing	**N/A**	**+ 275**	**+ 409**	**+ 145**	**+ 232**	**- 71**	**- 62**

It is acknowledged that the scenario resulting in the largest travel demand would be the sensitivity test student numbers with the baseline mode split applied as highlighted in blue in Table 38. However, as noted in Section 4.3, it is understood the likelihood of 77% of students travelling to / from the site by car for the following reasons:

- 40% of existing students live within 800m (10-minute) walk of the site, while the remaining 60% of existing students currently live outside 800m (10-minute) walk of the site. The baseline travel mode surveys showed 77% of students currently travel to / from school by car.
- The proposed reduction in catchment size results in **100% of students** living within 800m (10-minute) walk of the site, when compared to existing student locations this is an increase of 60% of students living close to school. It is understood this will result in a significant reduction in car travel and a higher uptake of active travel demands given all students will live within a 10-minute walk of the site.
- Improved infrastructure, including dedicated cycle paths, shared paths, footpaths and crossings will be delivered as part of the Melrose Park Precinct development (refer to Figure 16 for reference). This will encourage students to walk and cycle to / from the site.

It is understood, there will be a transitional period where students who currently live within the existing catchment (60%) but outside the proposed catchment will still attend MPPS. To complete a conservative assessment the moderate travel mode splits for the sensitivity test, which have been designed to take into consideration the transition period from the existing school population and existing catchment boundary to the proposed future scenario are adopted to understand student kiss & ride travel demands.

Future travel demands for car usage for primary school staff have been calculated in Section 4.3 and are summarised in Table 39. As shown in the following tables, a vehicle occupancy rate has been applied, which has been calculated based on the results of the baseline travel mode surveys undertaken at the school (refer to Section 2.8). The resulting existing and future vehicle volumes are shown in the below.

Table 39: Summary of Staff Vehicle Volumes

Traffic generation	Baseline			Moderate		Reach	
	Baseline	Proposed	Sensitivity	Proposed	Sensitivity	Proposed	Sensitivity
Staff number	22	50	63	50	63	50	63
Driver mode split	84%	84%	84%	75%	75%	50%	50%
Passenger mode split	3%	3%	3%	0%	0%	0%	0%
Car demand	19	44	55	38	47	25	32
Staff per car	1	1	1	1	1	1	1
Vehicle volume	19	44	55	38	47	25	32
Change from existing	**N/A**	**+ 25**	**+ 36**	**+ 18**	**+ 28**	**+ 6**	**+ 12**

It is acknowledged that the scenario resulting in the largest travel demand would be the sensitivity test staff numbers with the baseline mode split applied (as highlighted in blue). Whilst it is highly unlikely 84% of staff will drive to / from the site, given the upgrades to public transport and surrounding infrastructure, to provide a conservative assessment the baseline staff mode splits have been used in this assessment.

Therefore, a total vehicle generation of 382 (327 students + 55 staff) is expected. However, this is not a net increase in traffic generation, as it does not take into consideration the generation of the baseline school. In this regard, the net increase in traffic generation as a result of the proposed redevelopment is shown below in Table 40.

Table 40: Comparison of Baseline and Future Vehicle Volumes

	Student Vehicles	Staff Vehicles	Total Traffic Generation
Baseline	95	19	114
Future	327	55	382
Change from baseline	**+ 232**	**+ 36**	**+ 268**

This results in the proposed MPPS redevelopment generating approximately 268 (232 students + 36 staff) additional vehicle volumes as summarised in Table 40.

In terms of total trip generation, this would be equivalent to:

- Morning travel period: 500 trips (268 in, 232 out)
- Afternoon travel period: 500 trips (232 in, 268 out)

11.1.2 Preschool Vehicle Volumes

For preschool staff, it is assumed that travel habits will be similar to the primary school staff, therefore the baseline mode split of 87% (driver + passenger) is applied to the future staff number of 5 staff, to result in a trip generation of 4 preschool staff trips.

The RMS Guide to Traffic Generating Developments recommends application of a peak period traffic generation rate of 1.4 trips / child / hour during the AM peak period and a trip generation rate of 0.8 trips / child / hour has been adopted during the PM peak period. Application of these rates to the 60-child capacity, as well as the estimated staff trip generation results in the following peak period traffic generation:

- Morning travel period: 88 trips (46 in, 42 out)
- Afternoon travel period: 52 trips (24 in, 29 out)

The RMS rates are based on an average car travel mode split of 94%, which is considered conservative, as it is anticipated that many preschool students will live within the Melrose Park Precinct and therefore walk with their parent / carer to the site.

11.1.3 Total Vehicle Volumes

Combining the proposed primary school trip generation and preschool trip generation, the following total trips will result in each of the morning and afternoon travel periods as a worst-case scenario:

- Morning travel period: 588 trips (314 in, 274 out)
- Afternoon travel period: 552 trips (256 in, 296 out)

11.2 Trip Distribution

In developing the estimated future trip distributions for students and staff travelling by car, the following assumptions have been made:

- 2027 distributions consider the Melrose Park North road network being completed
- 2036 distributions consider the PLR Stage 2 corridor i.e. no right turn in or out of proposed staff car park on Waratah Street
  - All movements at the future signalised intersections along Hope Street are retained along the PLR corridor as per the approved Melrose Park North Internal Street Network report (Pentelic Advisory, 2022)
- 2036 distributions consider the Melrose Park South road network being completed as per the DCP masterplan
- Primary school and preschool students follow the same distributions
- Primary school and preschool staff follow the same distributions

11.2.1 Student Trip Distribution

Student trip distributions for 2027 have been developed based on the existing student location data provided by SINSW, as it is expected in opening year that students will reside in similar locations to existing conditions, as the catchment boundary transitions. For the future 2036 scenario when the school has transitioned to the proposed reduced catchment boundary, the trip distributions are based on the future student location estimates. Detailed student location analysis has been undertaken and is discussed in Section 4.2. Therefore, the following assumptions have been adopted for the student trip distributions:

2027

- 5% east from Victoria Road
- 45% west from Hope Street
- 20% south from Andrew Street
- 5% north from Marsden Road
- 10% east from Lancaster Avenue
- 15% north from NSR-3

2036

- 20% west from Hope Street
- 25% west from the future Mary Street extension
- 5% south from Wharf Road
- 45% north from NSR-3
- 5% north from Wharf Road

The trip distribution diagrams for 2027 and 2036 are shown in Figure 47 and Figure 48.

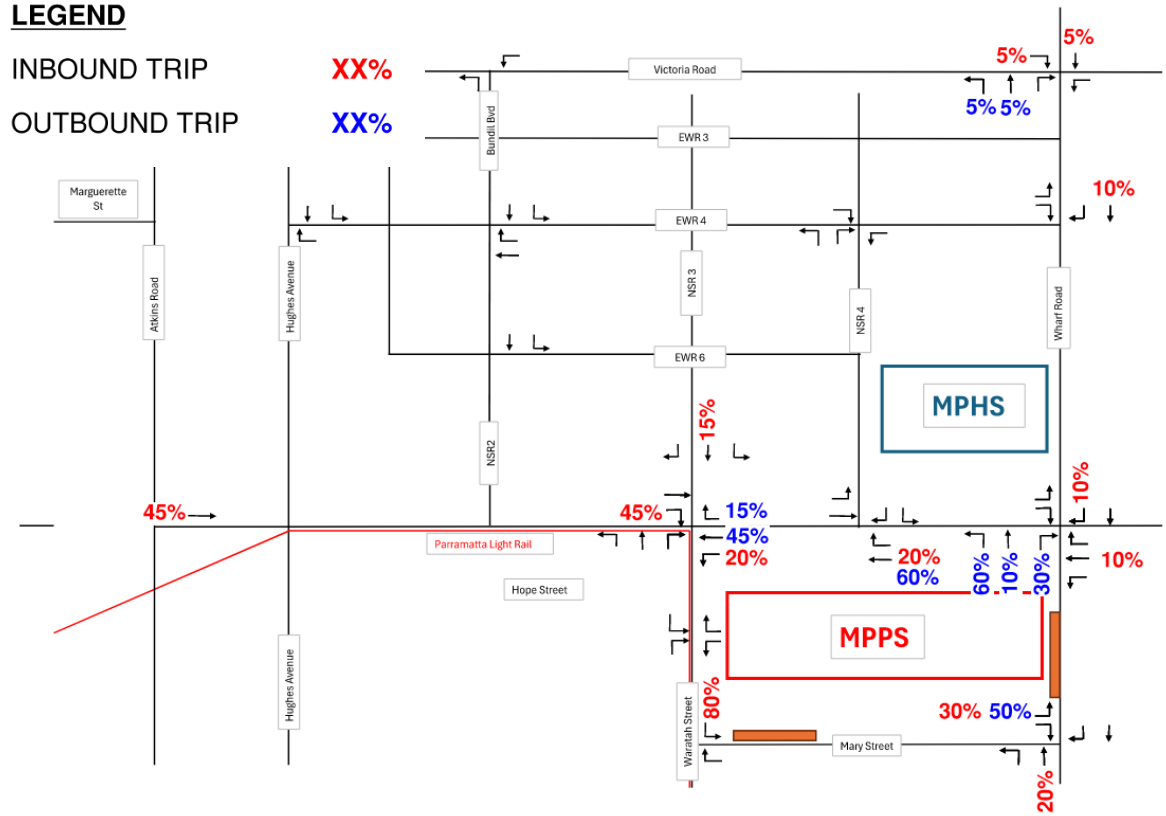


Figure 47: 2027 Student Trip Distributions for AM and PM Travel Periods

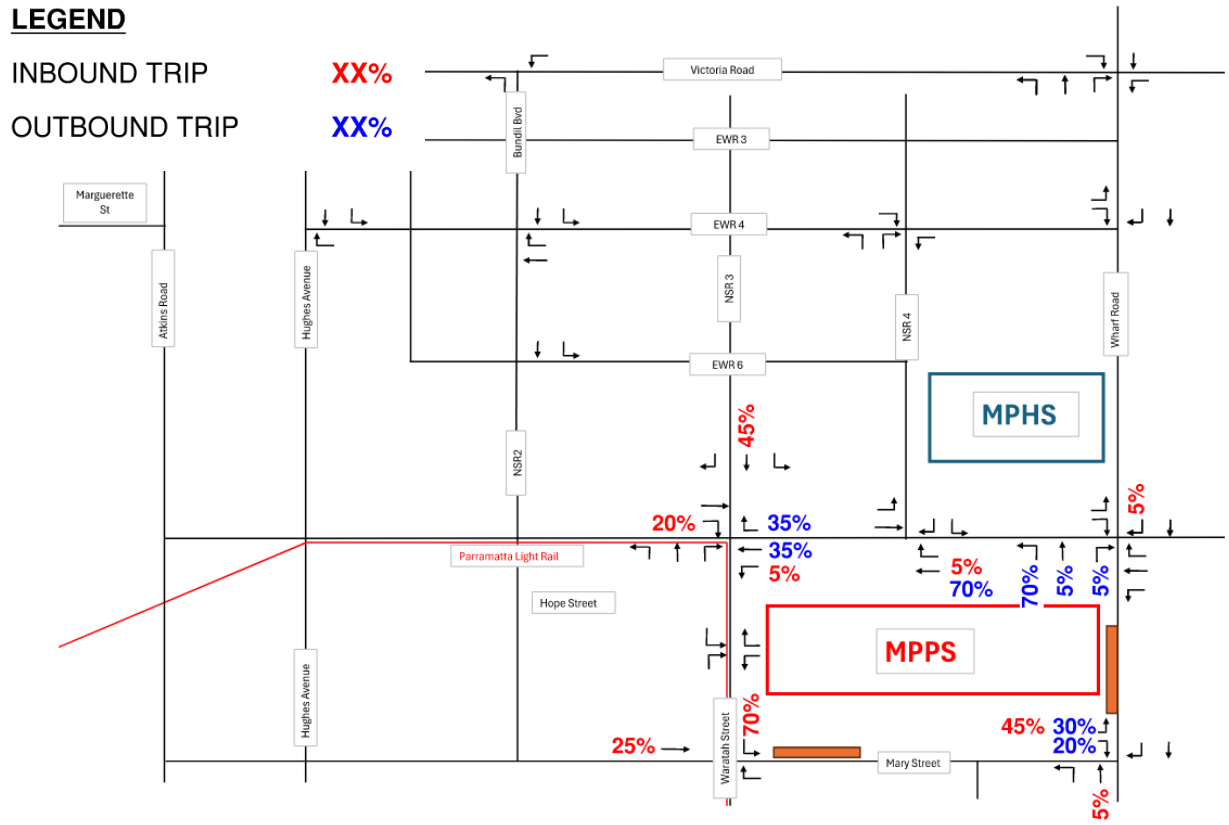


Figure 48: 2036 Student Trip Distributions for AM and PM Travel Periods

11.2.2 Staff Trip Distribution

Staff trip distributions have been derived based on the school's general location relative to the surrounding main roads that staff would be expected to drive to and from the site from. The following assumptions have been adopted for the staff trip distributions:

- 45% east from Victoria Road
- 40% west from Victoria Road via Hope Street
- 10% south from Andrew Street
- 5% north from Marsden Road

The trip distribution diagrams for 2027 and 2036 in the morning and afternoon peaks are shown in Appendix C.

11.3 Modelling Methodology

11.3.1 Scope of Modelling

The scope of traffic modelling studies includes the Wharf Road / Hope Street / Lancaster Avenue intersection to the northeast of the school as shown in Figure 49. This scope has been discussed with and accepted by Council.

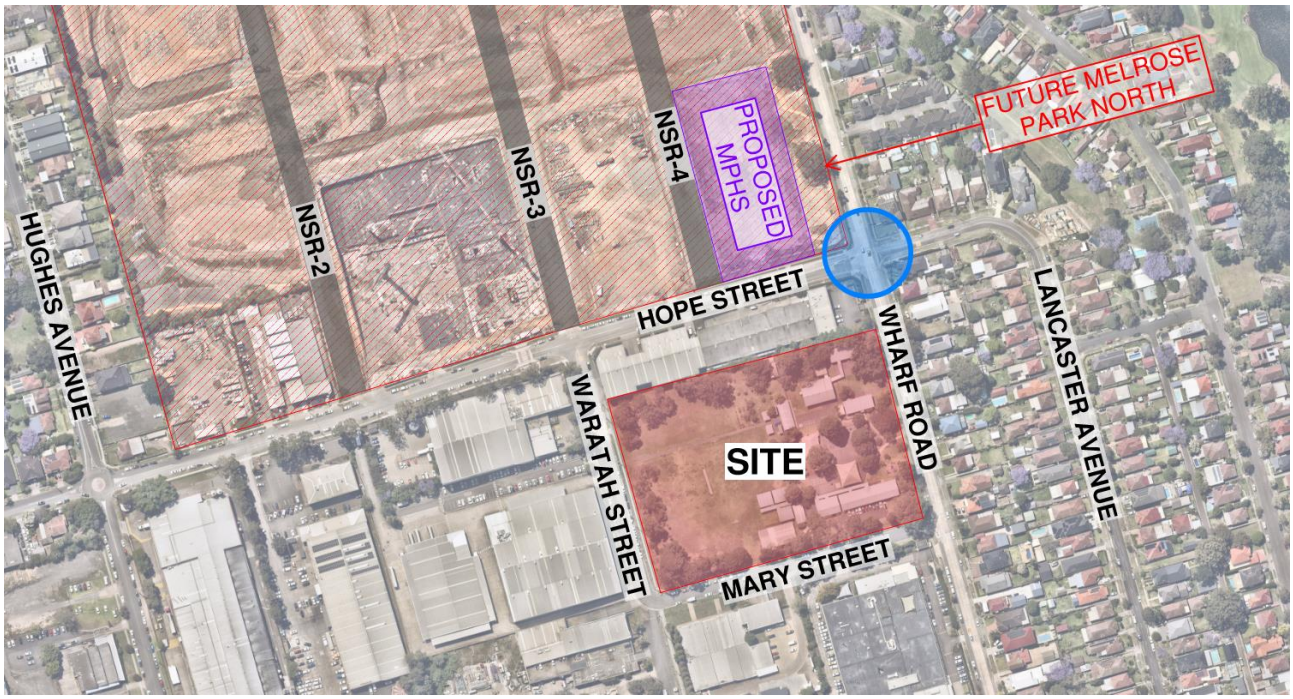


Figure 49: Scope of Intersection Modelling
Source: Modified from Nearmap

The Wharf Road / Hope Street / Lancaster Avenue intersection has been modelled in SIDRA (Version 9.1) and set up as an individual site as indicated in Figure 50 for baseline and future conditions. Note that these diagrams are schematic only and do not reflect the actual road geometry.

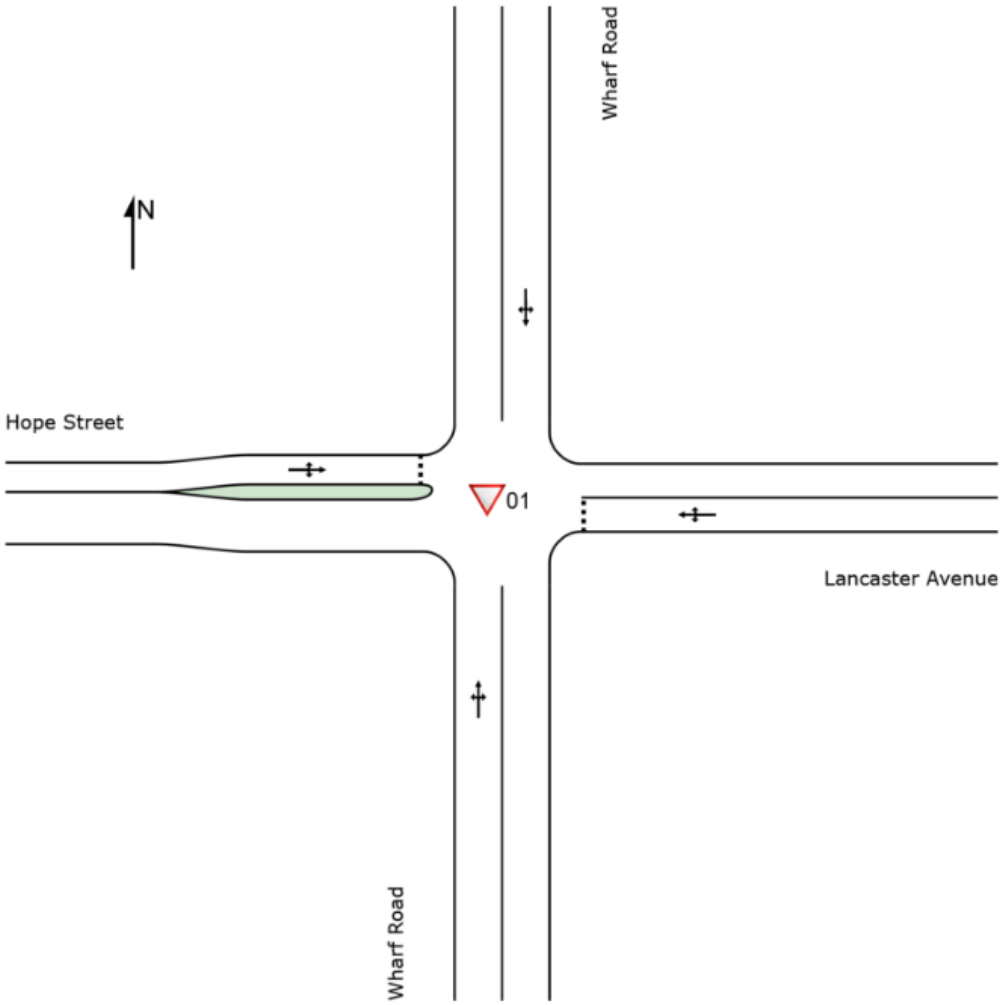


Figure 50: SIDRA Layout of the Wharf Road / Hope Street / Lancaster Avenue Intersection
Source: TTW SIDRA Models

11.3.2 Modelling Scenarios

To understand the impact of the proposed development and prepare a suitable baseline scenario to assess the proposed development against, multiple scenarios have been reviewed, as defined in Table 41.

Table 41: Modelling Scenarios

Scenario	Year	Description
1	2036 Background Traffic	**Baseline** – future year traffic volumes as per the approved Melrose Park North Internal Street Network report (Pentelic Advisory, 2022). Note these volumes are forecast for 2036 but have been adopted in all following scenarios for a conservative approach.
2	2027 MPPS opening year	**Opening year with development** – baseline traffic plus proposed development volumes for MPPS opening year capabilities.
3	2036 MPPS sensitivity test	**Future year with development** – baseline traffic plus proposed development volumes for MPPS future year capabilities.

11.3.3 Peak Periods

As mentioned above, the future year traffic volumes have been adopted from the Melrose Park North Internal Street Network report, which are forecast for the year 2036. The volumes are provided for the commuter peaks in the AM and PM peak periods, assumed to be a 60-minute peak hour (not specified within the report). It is assumed that all development-related vehicle trips will occur within the same peak hour as the baseline traffic in the AM and PM peaks. This is a conservative approach, as school traffic peak hour typically occurs later than commuter peak in the morning and earlier than the commuter peak in the afternoon.

11.4 Traffic Conditions

Table 42 displays the summarised results of the SIDRA traffic modelling outputs for each scenario across both morning and afternoon peak periods. The tables report on the Degree of Saturation (DoS), average delay, Level of Service (LoS) and average queue length. Note that for unsignalised intersections (such as Wharf Road / Hope Street / Lancaster Avenue), the results are shown for the movement with the worst delay. The fully detailed SIDRA results are attached at Appendix D.

Table 42: Summary of Intersection Modelling for Wharf Road / Hope Street / Lancaster Avenue

	AM Peak				PM Peak			
Scenario	**DoS**	**Avg delay**	**LoS**	**95% queue**	**DoS**	**Avg delay**	**LoS**	**95% queue**
Baseline	0.363	11.2s	A	12.2m	0.347	14.6s	B	11.7m
2027 with dev	0.467	15.5s	B	16.5m	0.847	21.4s	B	72.3m
2036 with dev	0.458	15.0s	B	16.1m	0.854	20.9s	B	72.2m

The key findings and outcomes of the traffic modelling are included below.

Scenario 1 – Baseline:

- The model for the baseline scenario shows the intersection operates well, with spare capacity at the intersection for additional traffic volumes.

Scenario 2 –Opening year with development:

- The intersection continues to operate well in both the AM and PM peak periods. The LoS for the AM peak drops slightly from A to B, but with very minimal additional delays or queues. LoS B is an acceptable level of performance with spare capacity still available for additional vehicles.
- For the PM peak period, the movement with the worst delay in the 'baseline' scenario is the Hope Street right turn, resulting in a 95% back of queue length of 11.7m. In the '2027 with development' scenario, the worst-case movement becomes the Lancaster Avenue right turn movement, resulting in a 95% back of queue length of 72.3m (41.3m in the 'baselin'e scenario). This is not a significant increase in queue length, and only occurs for the 95th percentile, after which conditions quickly return to normal. For context, a queue of this length would extend back approximately to the bend in the road and has no impact to other intersections. Overall, a LoS B is maintained for the '2027 with development' scenario, which is an acceptable level of performance with spare capacity available for additional vehicles.
- As mentioned in Table 41, the baseline traffic volumes used in the model are forecast for the year 2036, so use of these volumes in 2027 provides a conservative approach. It is therefore expected that the actual intersection performance results for this scenario would exceed those shown in Table 43.

Scenario 3 – Future year with development:

- The intersection continues to perform well, with the same LoS B as per the opening year model. Therefore, following the MPPS upgrade, the intersection performance at Wharf Road / Hope Street / Lancaster Avenue for both the opening and future year scenarios shows an acceptable level of service, with spare capacity available.
- It is noted that the future year results show a slight improvement compared to the opening year scenario. This is due to the redistribution of traffic away from this intersection due to:
  - The adjusted catchment boundary, meaning students are now travelling more locally, and this intersection is located on the far eastern edge of the boundary, away from the concentrated areas of student population
  - The road network changes resulting from the PLR Stage 2, meaning staff movements are restricted to left-in and left-out only at the Waratah Street car park. This impacts the approach and departure routes available for staff.

It should be noted that for all 'with development' scenarios, the baseline travel mode splits are applied for staff, and the moderate travel mode splits for students (refer Section 11.1). This is considered to be a conservative approach, assuming some level of shift away from private vehicle use, but does not align to the long-term sustainable travel modes MPPS is expected to achieve. As discussed, the moderate travel mode splits have been designed to take into consideration the transition period from the existing school population and existing catchment boundary to the proposed future scenario. In practice, as the proposed catchment boundary is established and a School Transport Plan is implemented, car usage will decrease.

At 'reach' mode splits, total vehicle activity associated with MPPS would reduce considerably, resulting in lower traffic volumes than the existing school in its current operations. As shown in Table 38 and Table 39, the total change in vehicle volumes for future year under the 'reach' scenario is an overall reduction of 49 vehicles (reduction of 61 student vehicles and addition of 12 staff vehicles). It is not expected that this shift would occur immediately, but progress towards the 'reach' targets would occur through application of the School Transport Plan over time as well as the other suite of non-car travel improvements to be delivered by this project and the Melrose Park Precinct.

11.5 Cumulative Impacts of MPHS

As the Melrose Park Precinct is undergoing substantial development and growth, this assessment has considered the combined effect of multiple projects and activities. This section assesses in detail the cumulative impact of the proposed MPHS project that is located in close proximity to the primary school.

This sensitivity analysis demonstrates the impact of the combined proposed MPPS and MPHS traffic volumes on the Wharf Road / Hope Street / Lancaster Avenue intersection. The SIDRA network reflects the proposed geometry and crossing upgrades associated with the MPHS proposal, including a mid-block crossing on Hope Street and a crossing on the north leg of the Wharf Road / Hope Street intersection.

11.5.1 Trip Generation

This analysis has been completed with reference to the *MPHS TAIA by TTW, (Ref: TAIA, Rev 1, TTW 28/01/2025)*, to estimate the traffic generation and proposals associated with the MPHS proposal. The proposed MPHS is to cater for an ultimate capacity of 1,000 students and 79 staff by 2036.

As referenced in the MPHS TAIA, the traffic modelling undertaken as part of the Melrose Park North Internal Street Network, Traffic Report *(Ref: TIAv02, Pentelic Advisory, 07/12/2022)* includes the addition of a school for approximately 800 students on the proposed MPHS site (refer to Section 3.3 of the Melrose Park North Internal Street Network, Traffic Report). Therefore, traffic volumes associated with an 800-student school on the MPHS site have been already incorporated into the baseline traffic volumes. The MPHS TAIA completed an analysis to confirm the level of additional traffic generated as part of the MPHS proposal.

The total additional traffic volumes associated with MPHS (students + staff) is as follows:

- Morning travel period: +31 trips (16 in, 15 out)
- Afternoon travel period: -22 trips (-11 in, -11 out)

The MPHS TAIA outlines the pedestrian volumes at the crossings as follows:

- North leg crossing: 72 pedestrians
- Mid-block crossing: 44 pedestrians (SIDRA default of 55 used to be conservative)

The additional vehicle volumes associated with the proposed MPHS development are minimal (a maximum increase of 31 vehicles across the network). Therefore, no additional traffic volumes have been assessed for the proposed MPHS, as this minimal increase would have a negligible impact on the Wharf Road / Hope Street / Lancaster Avenue, given that the intersection is shown to operate at a satisfactory level with spare capacity for the future 2036 scenario with the MPPS development volumes.

Nonetheless, a sensitivity analysis model has been developed to understand the impact of the proposed crossings as part of the MPHS development (note, no additional MPHS traffic volumes have been added). Refer to Section 3.3 for further details on the proposed MPHS development). The methodology and results of this analysis are outlined in the following sections.

11.5.2 SIDRA Layout

The SIDRA model has been set up as a network model as indicated in Figure 51 to include the proposed crossings as part of the MPHS project. Note that these diagrams are schematic only and do not reflect the actual road geometry.

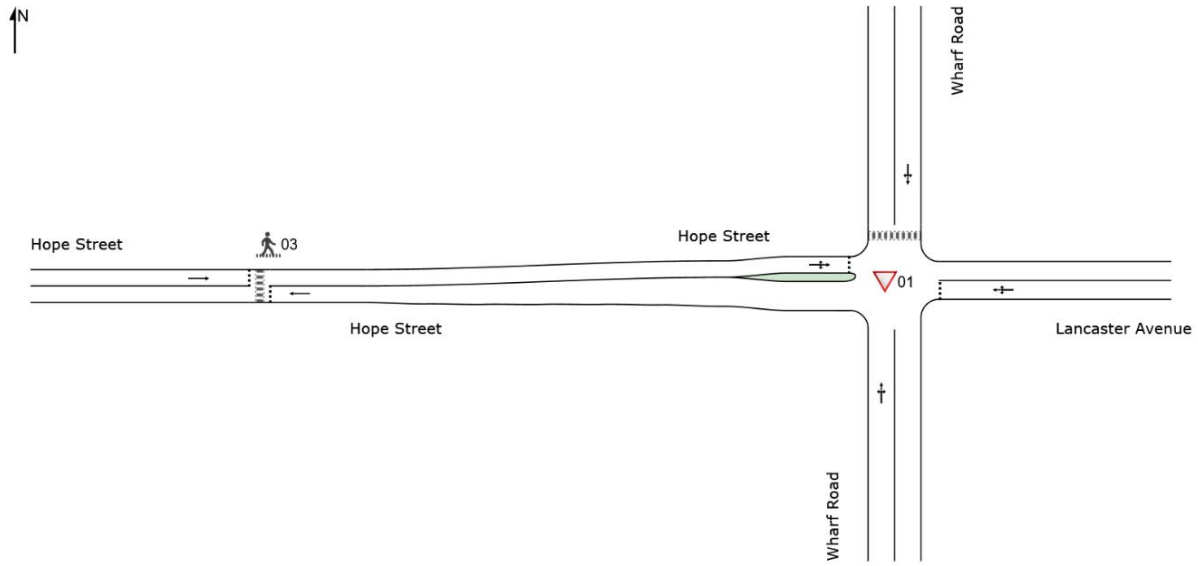


Figure 51: MPPS + MPHS Sensitivity Analysis SIDRA Model Layout
Source: TTW SIDRA Models

11.5.3 Traffic Conditions

Table 43 displays the summarised results of the SIDRA traffic modelling outputs for the scenario including the future proposed upgrades to the network as a result of the MPHS development across both morning and afternoon peak periods. The 'baseline' and 'with development' scenarios are also shown here for reference (as per Table 42). The fully detailed SIDRA results are attached at Appendix D.

Table 43: Intersection Modelling for Wharf Road / Hope Street with MPHS Volumes

	AM peak				PM peak			
Scenario	**DoS**	**Avg delay**	**LoS**	**95% queue**	**DoS**	**Avg delay**	**LoS**	**95% queue**
Baseline	0.363	11.2s	A	12.2m	0.347	14.6s	B	11.7m
2027 with dev	0.467	15.5s	B	16.5m	0.847	21.4s	B	72.3m
2036 with dev	0.458	15.0s	B	16.1m	0.854	20.9s	B	72.2m
2036 with dev + MPHS	0.458	14.9s	B	16.0m	0.868	23.4s	B	76.2m

The key findings and outcomes of the traffic modelling are included below:

Scenario 4 – 2036 MPPS Future Year + MPHS:

- The intersection continues to operate satisfactorily in both the AM and PM peak periods, with the same LoS B as per the 'with development' scenarios modelled for MPPS.
- A minor reduction in delay and queue length in the PM peak results from the additional pedestrian crossings, however this is minimal and the overall LoS is maintained at a satisfactory level.
- There is no increase to delay or queue length as a result of the pedestrian crossings for the AM period. This is because Table 43 reports only on the movement with the worst delay, which in this scenario is the west leg right turn and is therefore not impacted by the crossing on the north leg.

- Therefore, following the installation of the proposed crossings as part of the MPHS project, the intersection performance at Wharf Road / Hope Street / Lancaster Avenue shows an acceptable level of performance, with space capacity available.

11.6 Summary of Traffic Conditions

To summarise the key outcomes of the traffic modelling:

- Traffic generation for the proposed MPPS upgrade has been developed based on the 'moderate' mode splits for students and 'baseline' mode splits for staff as a conservative measure to capture the transition period from existing to proposed reduced catchment area.
- With this level of traffic generation, the Wharf Road / Hope Street / Lancaster Avenue intersection performs well at a satisfactory level of service of B or better for all tested scenarios, with spare capacity in the intersection to accommodate additional vehicle volumes.
- However, progress towards the 'reach' mode splits (i.e. reduction in traffic generation) is expected to occur over time as the proposed catchment boundary is established, a School Transport Plan is implemented and the set of non-car travel improvements is delivered by this project and the Melrose Park Precinct.
- The proposed MPPS upgrade is therefore shown to have minimal impact on the intersection and its future performance, particularly as the 'reach' mode splits are achieved.
- The impact to the performance of the Wharf Road / Hope Street / Lancaster Avenue intersection due to the separately proposed MPHS project are shown to be negligible. The MPHS traffic generation is almost wholly accounted for in the baseline traffic volumes, so no additional traffic volumes have been added for this sensitivity scenario. The addition of the proposed crossings at the north leg and the mid-block to the west show minimal worsening of delays and queues at the intersection.

Overall, the traffic modelling outcomes indicate that the proposed MPPS upgrade will have a minimal impact on the Wharf Road / Hope Street / Lancaster Avenue intersection. The proposal can therefore be supported from a traffic and transport perspective.

Section 12 Mitigation Measures

Table 44 summarises the physical infrastructure and operational measures that will support the transport needs of the proposed school and allow the project to achieve acceptable performance and safety.

Table 44: Mitigation Measures

Mitigation Name	When is Mitigation Measure to be Complied With	Mitigation Measure	Reason for Mitigation Measure
Infrastructure Upgrades			
1 – Bike parking	Prior to occupation	58 bike parking spaces provided on-site	To support expected mode share & meet DCP requirements for staff
2 – End-of-trip	Prior to occupation	3 showers / change and 9 lockers provided for staff	To support expected mode share & encourage active travel
3 – Footpath widening	Prior to occupation	Widen footpaths to 3m along Wharf Road site frontage	To support safe pedestrian movements at kiss & ride zones
4 – K&R zones	Prior to occupation	Kiss & ride zones on Mary Street and Wharf Road of 78m and 42m	To support increased demands & spread traffic to reduce impacts
5 – Accessible K&R	Prior to occupation	32m (4 bays) on-street accessible parking bays on Wharf Road	To facilitate safe and convenient access to SELU classrooms
5 – Loading dock	Prior to occupation	Formal on-site waste collection and loading dock to cater 10.8m truck	To facilitate on-site service and loading activities
6 – Car park	Prior to occupation	33 primary school staff spaces and 15 preschool spaces	To support increased demands & facilitate safe pick-up and drop-off activity at preschool
Construction Activities			
7 – Construction Traffic Management Plan	Prior to construction	Develop & implement Construction Traffic Management Plan	To ensure construction traffic is managed and safety is maintained
Operations and Management			
8 – School Transport Plan	Prior to occupation	Develop & implement School Transport Plan	To promote sustainable travel & shift away from car use

Section 13 Conclusion

Subject to implementing the recommendations / mitigation measures set out in Section 12 of this report, the conclusion of this assessment is that the proposed Activity is not likely to significantly affect the environment in relation to traffic and transport matters.

The overall transport strategy for the proposed MPPS is as follows:

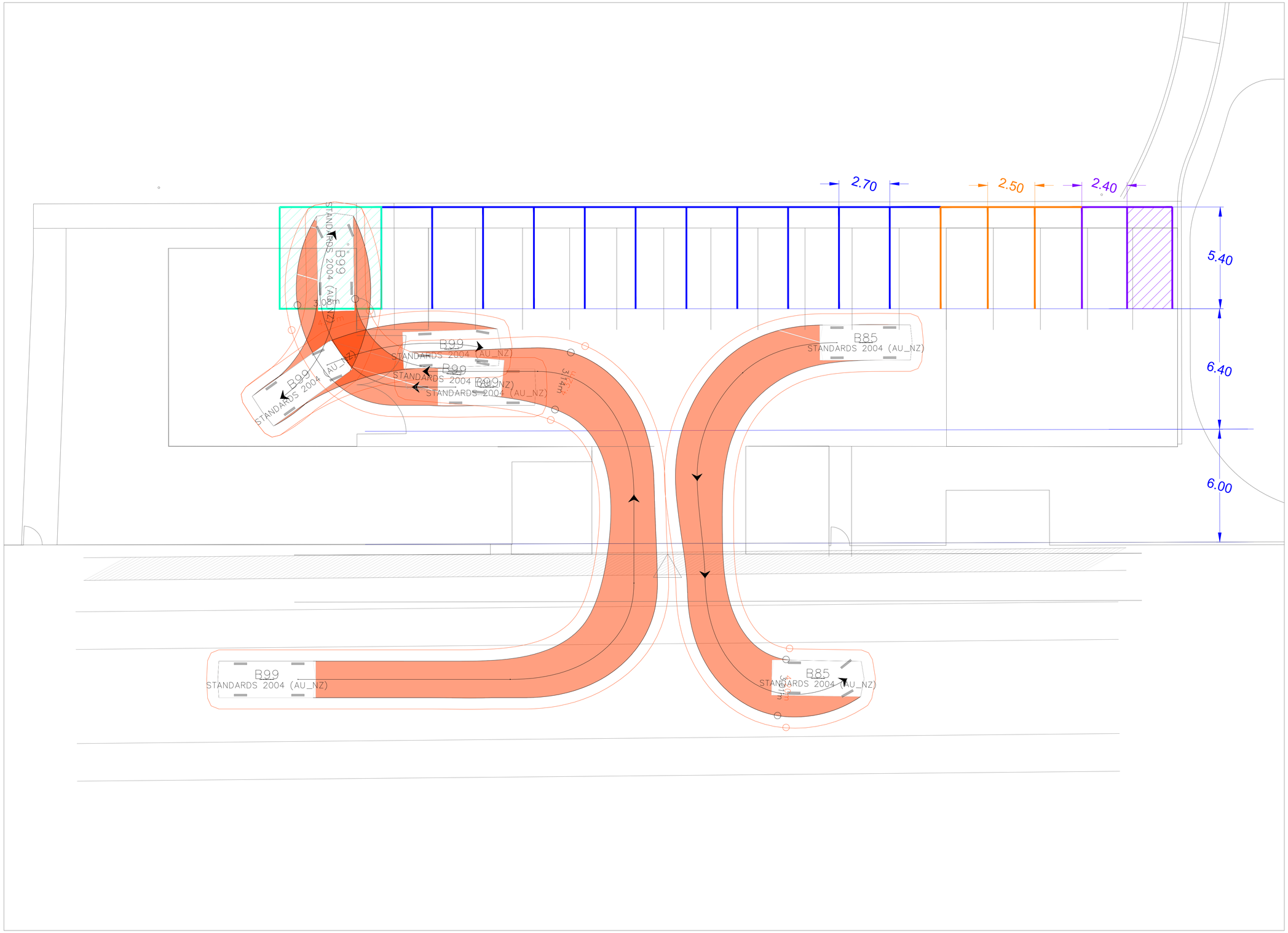
- Provide a sustainable transport strategy, prioritising active and public transport and discouraging travel by private vehicle
- Encourage and facilitate pedestrian movements within a walkable local catchment through provision of infrastructure such as footpath widening works
- Encourage and facilitate cyclist movements across the wider catchment by connecting to existing and proposed shared paths and providing on-site bike parking facilities for both students and staff, as well as end-of-trip facilities for staff
- Accommodate service vehicles on the site with a dedicated on-site loading dock and waste collection zone for vehicles up to and including a 10.8 metre waste truck
- Facilitate kiss & ride activity while discouraging its uptake, with provision of two kiss & ride zones to distribute traffic across the network, and implement a School Transport Plan to encourage and advertise the range of alternative transport options available
- Facilitate car parking activity while discouraging its uptake, with provision of on-site car parking for 50% of staff when the school is at full capacity, achieving a shift from higher initial usage to this lower percentage usage over time, in parallel to the growth of the student and staff population at the school.
- Maintain a suitable level of performance at the key intersection of Wharf Road / Hope Street for the future ultimate development and cumulative development scenarios, with minimal vehicle delays and queues.

This overall strategy has been proposed to and discussed with both Council and TfNSW during ongoing project liaison through two TWG meetings for the project. The TWG meeting held with these authorities during the development of this TAIA was held in November 2024, and the project has refined the transport strategy in response to feedback received.

Overall, the transport provisions of this project across all travel modes have been selected and developed in order to provide a sustainable, safe, and efficient site. These provisions include physical infrastructure works on- and off-site, along with management measures to be implemented during operation of the school. While school sites generate significant volumes of travel demand in short periods of time, the proposed transport strategy is considered an appropriate balance and is demonstrated to provide appropriate outcomes for the site.

Prepared by	Reviewed by	Approved by
TTW (NSW) PTY LTD	**TTW (NSW) PTY LTD**	**TTW (NSW) PTY LTD**
		
EMMA COWDERY	**MARIA MULHOLLAND**	**MICHAEL BABBAGE**
Traffic Engineer	Senior Traffic Engineer	Associate (Traffic)

Appendix A Swept Path Analysis



B85

	meters
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Track	: 1.77
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Steering Angle	: 34.1

B99

	meters
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Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

THIS DRAWING HAS BEEN PREPARED USING COLOUR

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FileName: 241731-TTW-00-Sk-TR-00003-[P1]-PRESCHOOL B85 B99.dwg - USER: emmac - Plot File Created: Feb 21, 2025 - 12:16pm

Rev	Description	Eng	Draft	Date
P1	PRELIMINARY	EC	EC	21/02/25

Architect
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Engineer
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612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project
MELROSE PARK PRIMARY SCHOOL

Sheet Subject
SWEPT PATH PLAN
PRESCHOOL CAR PARK
B85 AND B99 CAR

Scale : A1	Drawn	Authorised
1:100	EC	

Job No	Drawing No	Revision
241731	SKTR00003	P1

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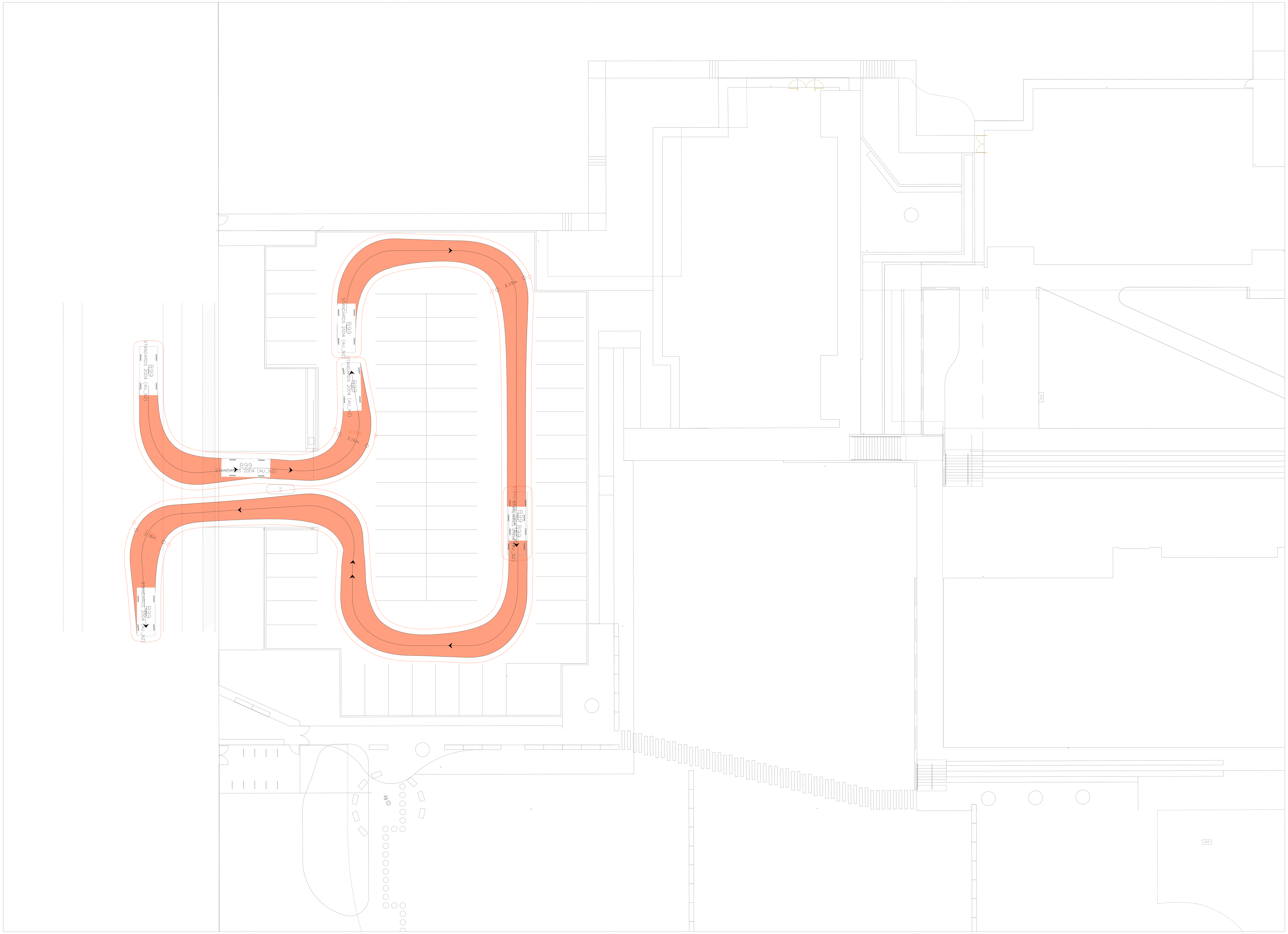

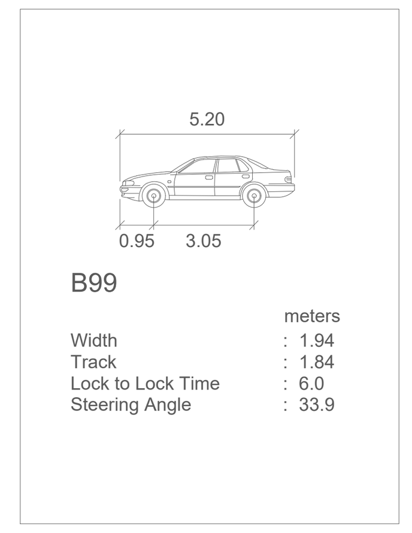

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Rev	Description	Eng	Draft	Date
P1	PRELIMINARY	EC	EC	21/02/25

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Project
MELROSE PARK PRIMARY SCHOOL

Sheet Subject
SWEPT PATH PLAN
PRIMARY SCHOOL CAR PARK
B99 CAR

Scale : A1	Drawn	Authorised
1:100	EC	

Job No	Drawing No	Revision
241731	SKTR00004	P1

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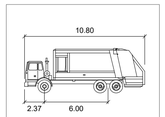

10.8m Waste Truck Veolia

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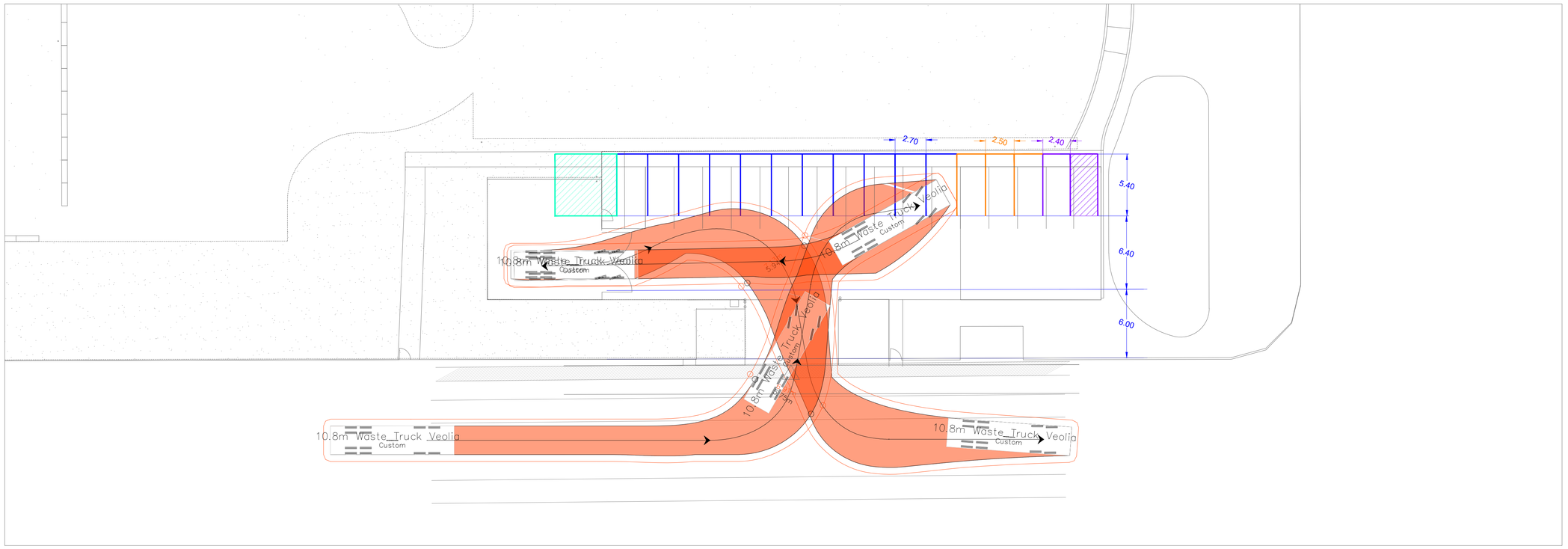
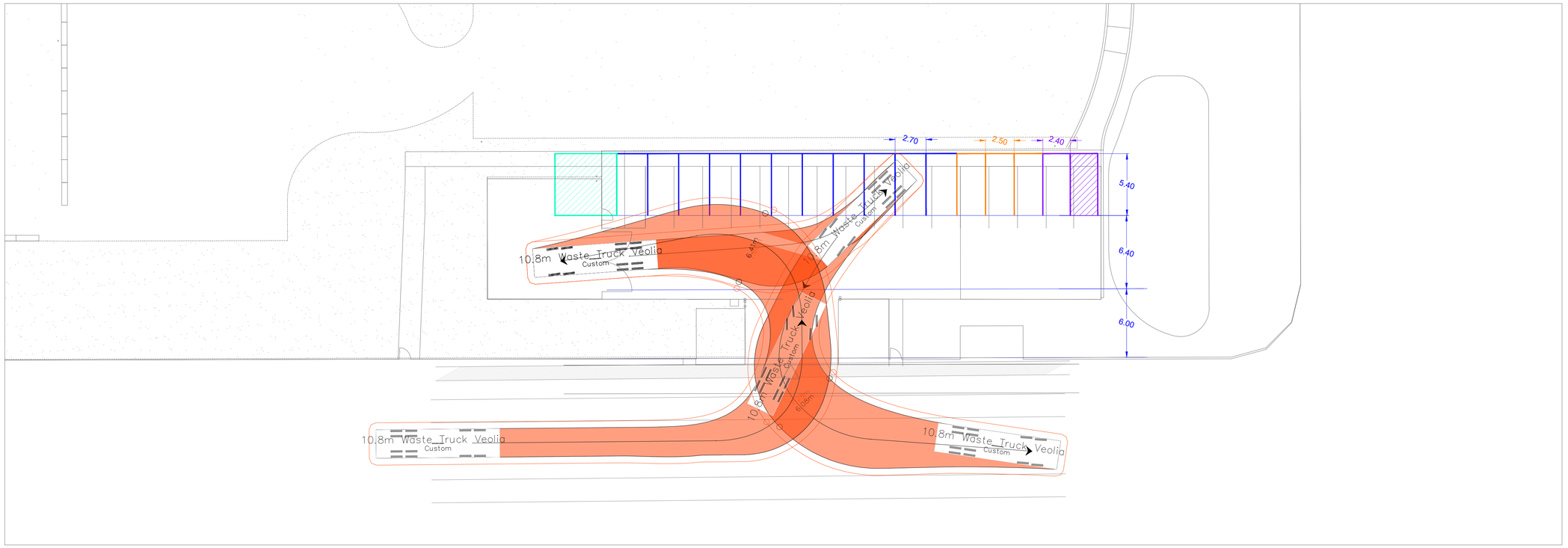
Lock to Lock Time	: 6.0
Steering Angle	: 40.0



REAR LOAD



FRONT LOAD

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Rev	Description	Eng	Draft	Date
P1	PRELIMINARY	EC	EC	21/02/25

Rev Description Eng Draft Date

Rev Description Eng Draft Date

Architect
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612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

Project
MELROSE PARK PRIMARY SCHOOL

Sheet Subject
SWEPT PATH PLAN
WASTE AREA
10.8m TRUCK

Scale : A1	Drawn	Authorised
1:200	EC	

Job No	Drawing No	Revision
241731	SKTR00005	P1

Plot File Created: Feb 21, 2025 - 2:58pm

Appendix B Queueing Analysis

K&R Queuing Analysis - Mary Street

Minute	Arrivals (veh)	Cumulative arrivals (veh)	Served (veh)	Cumulative served (veh)	End-of-minute residual vehicles (veh)	Total queue length (m)
1	4.9	5	6	6	0	0.0
2	4.9	10	6	12	0	0.0
3	4.9	15	6	18	0	0.0
4	4.9	20	6	24	0	0.0
5	4.9	24	6	30	0	0.0
6	4.9	29	6	36	0	0.0
7	4.9	34	6	42	0	0.0
8	4.9	39	6	48	0	0.0
9	4.9	44	6	54	0	0.0
10	4.9	49	6	60	0	0.0
11	4.9	54	6	66	0	0.0
12	4.9	59	6	72	0	0.0
13	4.9	64	6	78	0	0.0
14	4.9	69	6	84	0	0.0
15	4.9	73	6	90	0	0.0
16	4.9	78	6	96	0	0.0
17	4.9	83	6	102	0	0.0
18	4.9	88	6	108	0	0.0
19	4.9	93	6	114	0	0.0
20	4.9	98	6	120	0	0.0
21	4.9	98	6	126	0	0.0
22	4.9	98	6	132	0	0.0
23	4.9	98	6	138	0	0.0
24	4.9	98	6	144	0	0.0
25	4.9	98	6	150	0	0.0
26	4.9	98	6	156	0	0.0
27	4.9	98	6	162	0	0.0
28	4.9	98	6	168	0	0.0
29	4.9	98	6	174	0	0.0
30	4.9	98	6	180	0	0.0

Total students	720		
Car mode split	50%		
Student demand	360		
Assumed occupancy	1.5	students/veh	*calculated as per student travel surveys*
Activity during peak hour	80%		
Activity at this zone	60%		
Activity at formal K&R zone	85%		
Vehicles at K&R zone	98		
Total duration	20	min	
Turnover time	1	mins	
Active bays per zone	6		
Processing rate	6.0	veh/min	
Peak proportion	100%		
Peak no.	98		
Peak rate	4.9	veh/min	
Vehicle size	6	m	

K&R Queuing Analysis - Wharf Road

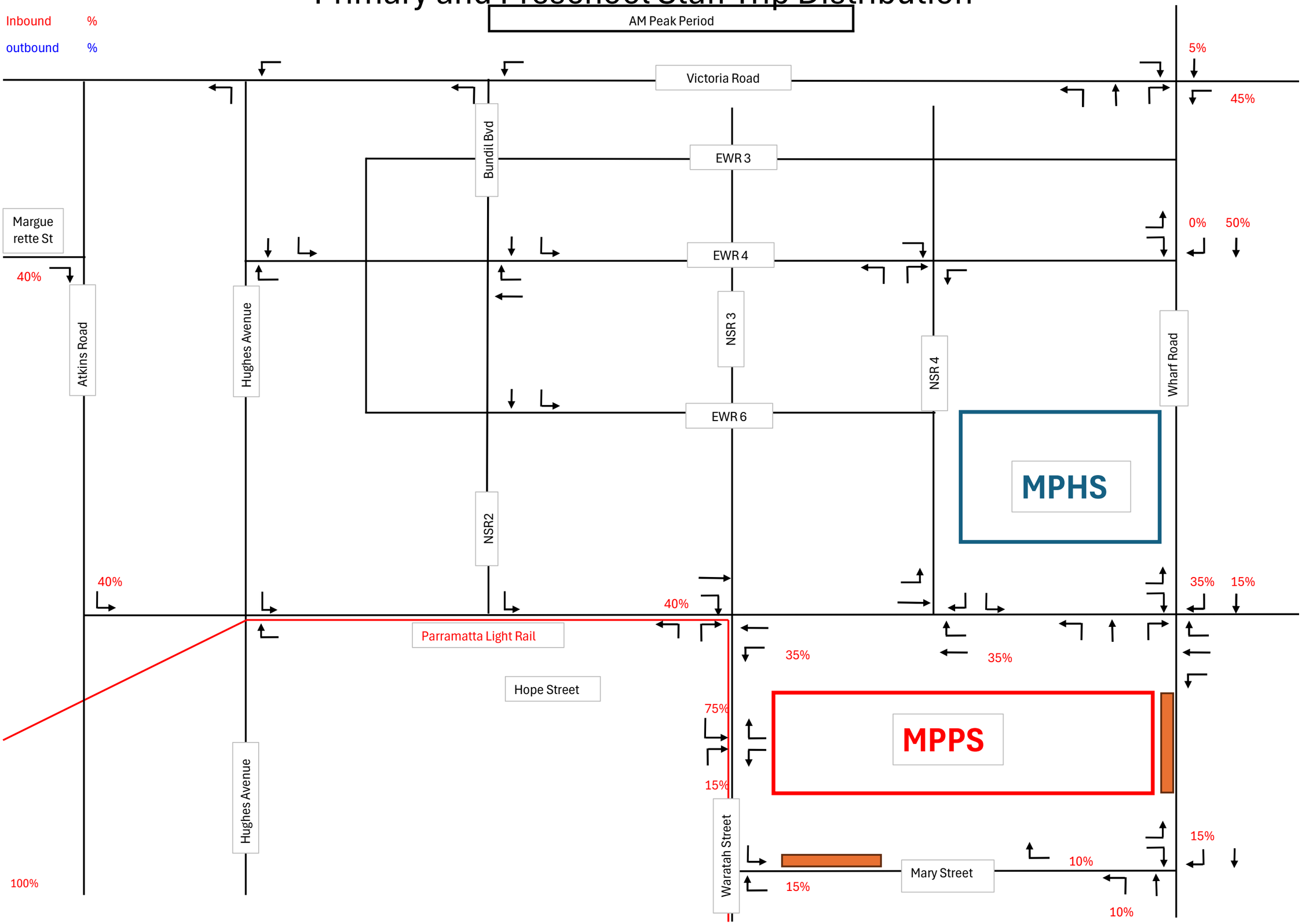
Minute	Arrivals (veh)	Cumulative arrivals (veh)	Served (veh)	Cumulative served (veh)	End-of-minute residual vehicles (veh)	Total queue length (m)
1	3.3	3	4	4	0	0.0
2	3.3	7	4	8	0	0.0
3	3.3	10	4	12	0	0.0
4	3.3	13	4	16	0	0.0
5	3.3	16	4	20	0	0.0
6	3.3	20	4	24	0	0.0
7	3.3	23	4	28	0	0.0
8	3.3	26	4	32	0	0.0
9	3.3	29	4	36	0	0.0
10	3.3	33	4	40	0	0.0
11	3.3	36	4	44	0	0.0
12	3.3	39	4	48	0	0.0
13	3.3	42	4	52	0	0.0
14	3.3	46	4	56	0	0.0
15	3.3	49	4	60	0	0.0
16	3.3	52	4	64	0	0.0
17	3.3	55	4	68	0	0.0
18	3.3	59	4	72	0	0.0
19	3.3	62	4	76	0	0.0
20	3.3	65	4	80	0	0.0
21	3.3	65	4	84	0	0.0
22	3.3	65	4	88	0	0.0
23	3.3	65	4	92	0	0.0
24	3.3	65	4	96	0	0.0
25	3.3	65	4	100	0	0.0
26	3.3	65	4	104	0	0.0
27	3.3	65	4	108	0	0.0
28	3.3	65	4	112	0	0.0
29	3.3	65	4	116	0	0.0
30	3.3	65	4	120	0	0.0

Total students	720		
Car mode split	50%		
Student demand	360		
Assumed occupancy	1.5	students/veh	*calculated as per student travel surveys*
Activity during peak hour	80%		
Activity at this zone	40%		
Activity at formal K&R zone	85%		
Vehicles at K&R zone	65		
Total duration	20	min	
Turnover time	1	mins	
Active bays per zone	4		
Processing rate	4.0	veh/min	

Peak proportion	100%	
Peak no.	65	
Peak rate	3.3	veh/min
Vehicle size	6	m

Appendix C Trip Distribution

Primary and Preschool Staff Trip Distribution



Primary and Preschool Staff Trip Distribution

Primary and Preschool Staff Trip Distribution

Inbound %

outbound %

PM Peak Period

Victoria Road

40%

5% 45%

Bundil Bvd

EWR 3

Marguerette St

EWR 4

Atkins Road

Hughes Avenue

NSR 3

NSR 4

Wharf Road

EWR 6

MPHS

NSR2

35%

35%

40%

Parramatta Light Rail

40% 35%

0% 15%

Hope Street

75%

15%

MPPS

Hughes Avenue

Waratah Street

15%

10%

15%

10%

Mary Street

CHECK 100%

Primary and Preschool Student Trip Distribution

Inbound %

Outbound %

AM Peak Period

Victoria Road

Bundil Bvd

EWR 3

EWR 4

EWR 6

NSR 3

NSR 4

NSR2

Marguerette St

Atkins Road

Hughes Avenue

Wharf Road

Parramatta Light Rail

Hope Street

Waratah Street

Mary Street

MPHS

MPPS

5% 5% 5% 5%

10% 10% 10% 10%

45% 45%

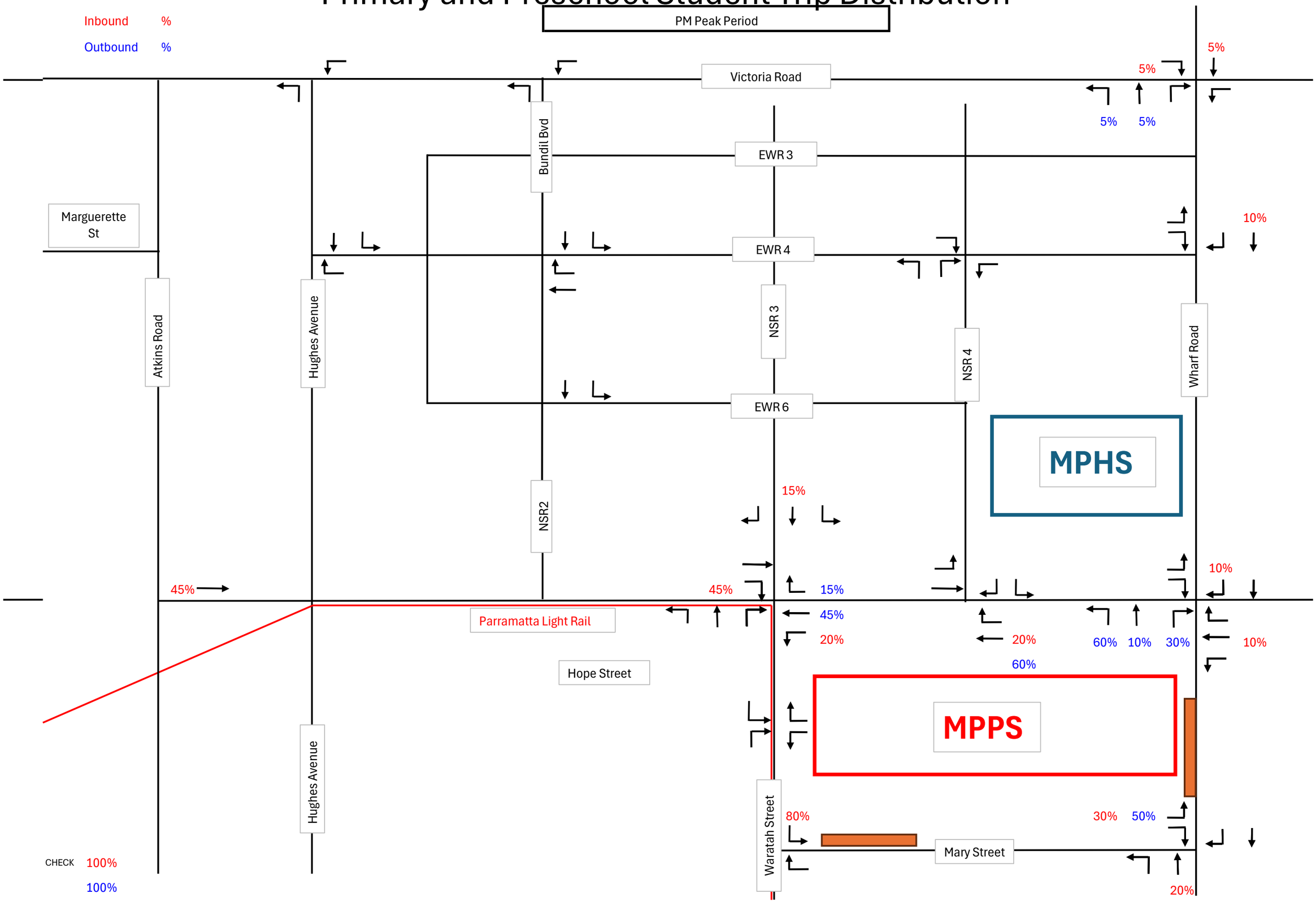
15% 15% 45% 20%

20% 60% 60% 10% 30%

80% 30% 50% 20%

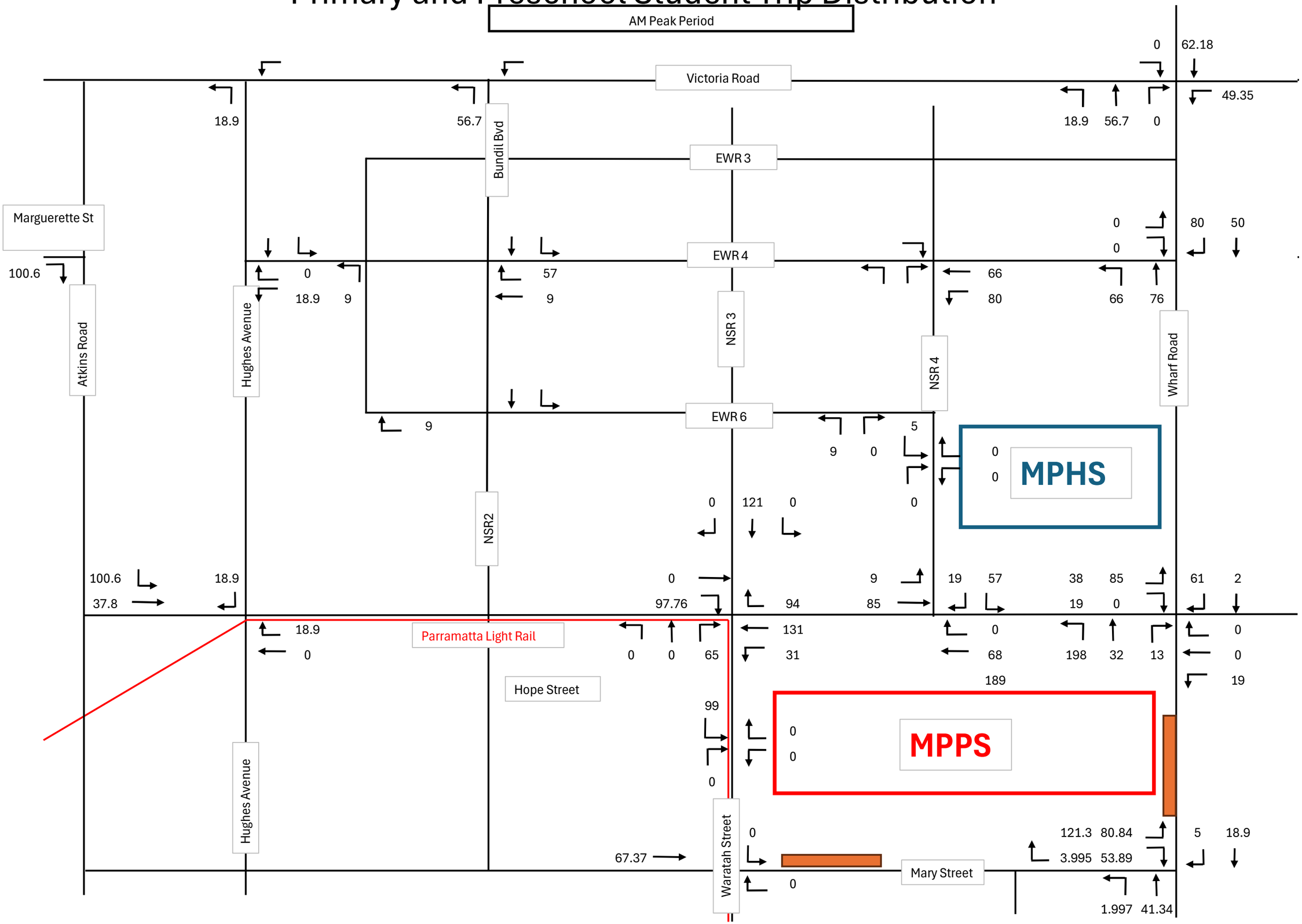
CHECK 100% 100%

Primary and Preschool Student Trip Distribution



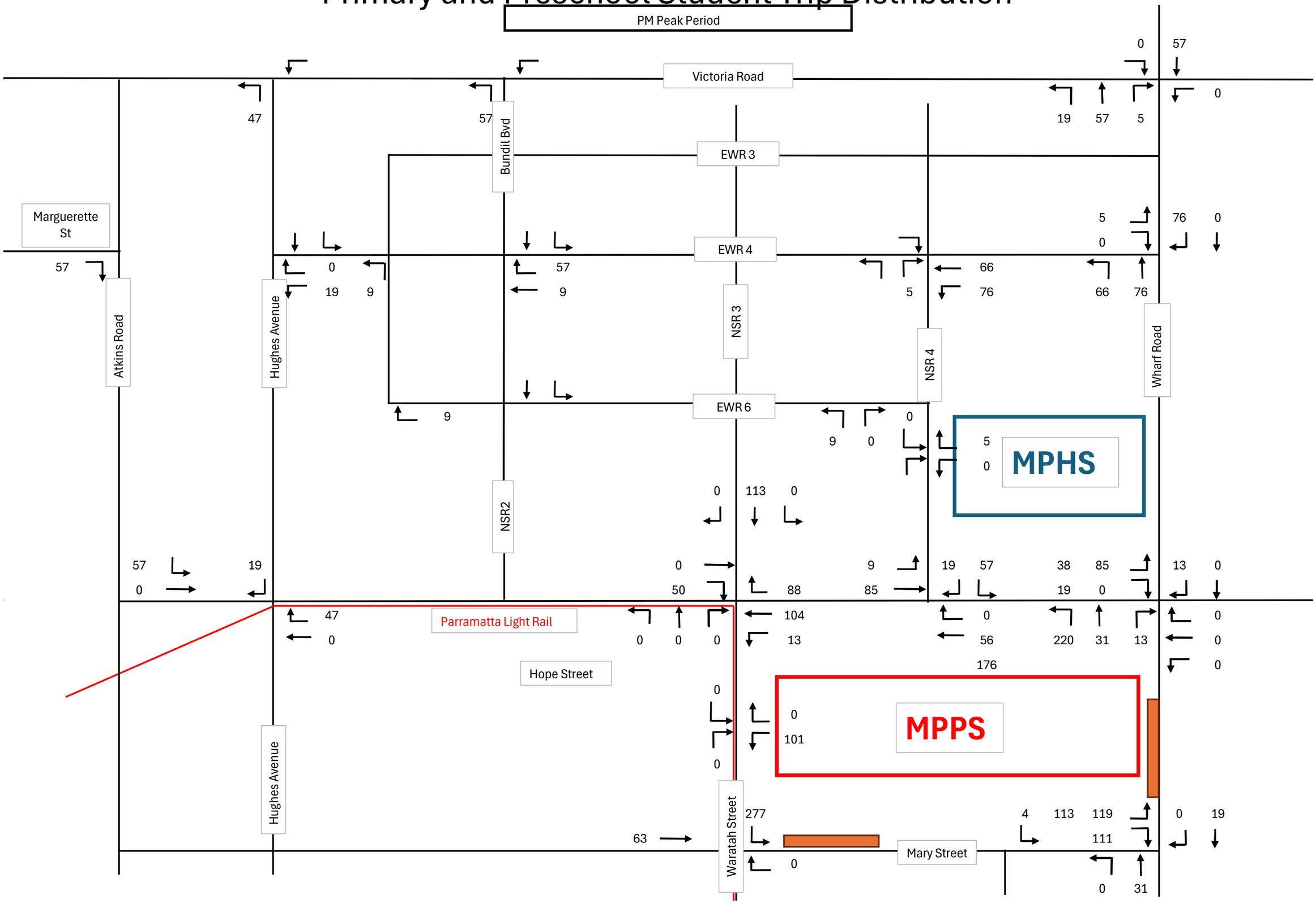
Primary and Preschool Student Trip Distribution

AM Peak Period



Primary and Preschool Student Trip Distribution

PM Peak Period



Primary and Preschool Staff Trip Distribution

Inbound %

outbound %

AM Peak Period

Victoria Road

Bundil Bvd

EWR 3

EWR 4

EWR 6

NSR 3

NSR 4

NSR2

Marguerette St

Atkins Road

Hughes Avenue

Wharf Road

Parramatta Light Rail

Hope Street

Waratah Street

Mary Street

MPHS

MPPS

5%

45%

0%

50%

40%

40%

40%

45%

45%

45%

5%

0%

45%

5%

85%

10%

5%

5%

5%

CHECK 100%

Primary and Preschool Staff Trip Distribution

Primary and Preschool Staff Trip Distribution

Inbound %

outbound %

PM Peak Period

Victoria Road

40%

Bundil Bvd

EWR 3

Marguerette St

EWR 4

Atkins Road

Hughes Avenue

NSR 3

NSR 4

Wharf Road

EWR 6

MPHS

NSR2

40%

Parramatta Light Rail

40%

40%

40%

Hope Street

MPPS

90%

Hughes Avenue

Waratah Street

90%

10%

40%

60%

Mary Street

CHECK 100%

Primary and Preschool Student Trip Distribution

Inbound %

Outbound %

AM Peak Period

Victoria Road

Bundil Bvd

EWR 3

EWR 4

EWR 6

Marguerette St

Atkins Road

Hughes Avenue

NSR 3

NSR 4

Wharf Road

NSR2

MPHS

MPPS

Parramatta Light Rail

Hope Street

Waratah Street

Mary Street

45%

20%

35%

35%

5%

5%

5%

70%

5%

5%

70%

70%

45%

30%

20%

5%

25%

CHECK 100%

100%

Primary and Preschool Student Trip Distribution

Inbound %

Outbound %

PM Peak Period

Victoria Road

Bundil Bvd

EWR 3

Marguerette St

EWR 4

Atkins Road

Hughes Avenue

NSR 3

NSR 4

Wharf Road

EWR 6

MPHS

NSR2

45%

20%

35%

35%

5%

5%

5%

70%

5%

5%

70%

Parramatta Light Rail

Hope Street

MPPS

Hughes Avenue

Waratah Street

70%

25%

45%

30%

20%

Mary Street

5%

CHECK 100%

100%

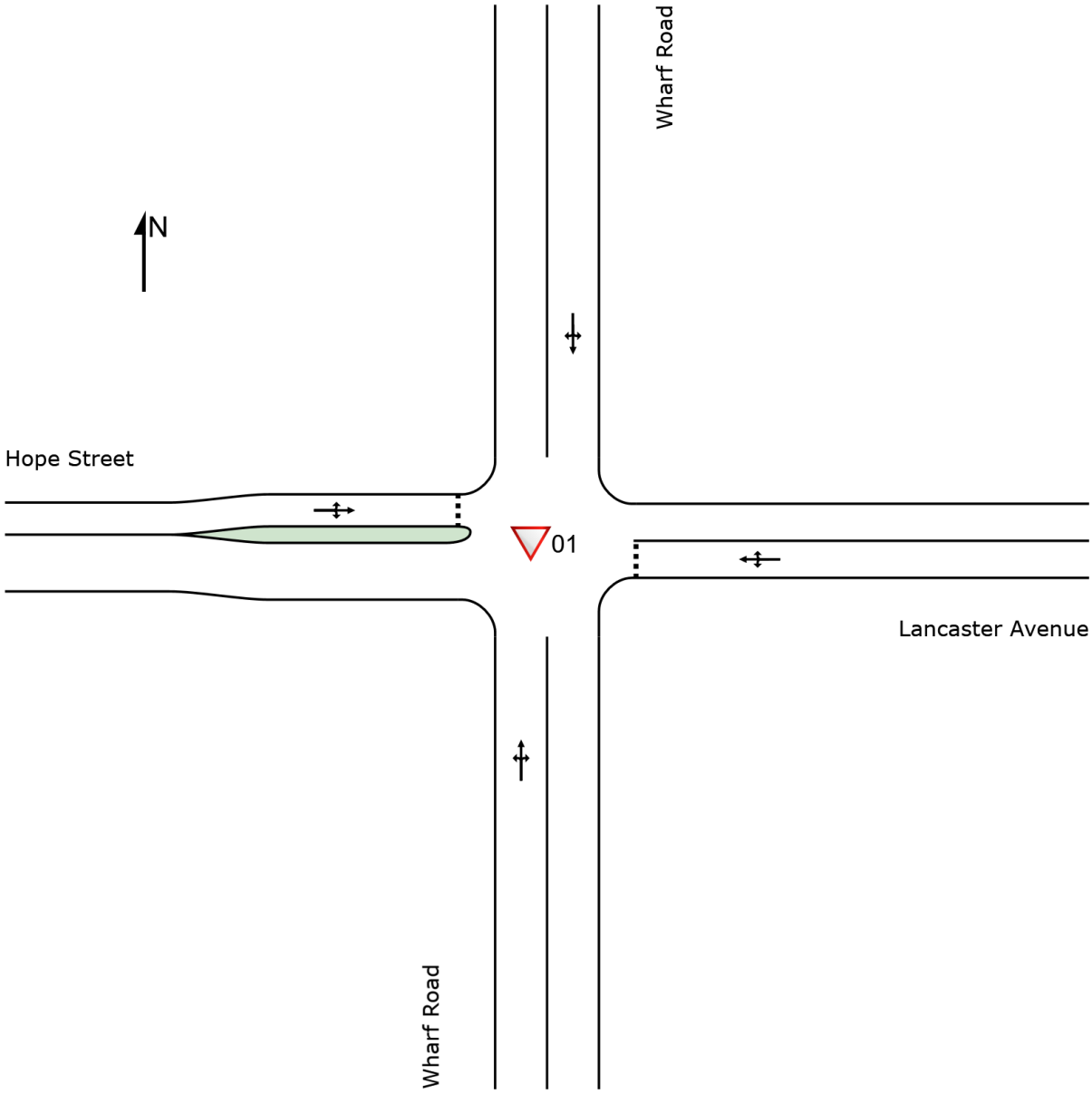
Appendix D SIDRA Intersection Modelling Results

SITE LAYOUT

Site: 01 [Hope St / Wharf Rd (Site Folder: (AM) Background)]

4-leg give way intersection
AM Peak
Site Category: Base Year
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 01 [Hope St / Wharf Rd (Site Folder: (AM) Background)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

4-leg give way intersection
AM Peak
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wharf Road															
1	L2	All MCs	53	3.0	53	3.0	0.217	5.1	LOS A	1.1	7.9	0.25	0.33	0.25	44.5
2	T1	All MCs	178	3.0	178	3.0	0.217	0.4	LOS A	1.1	7.9	0.25	0.33	0.25	47.7
3	R2	All MCs	161	3.0	161	3.0	0.217	5.1	LOS A	1.1	7.9	0.25	0.33	0.25	46.6
Approach			392	3.0	392	3.0	0.217	2.9	NA	1.1	7.9	0.25	0.33	0.25	46.9
East: Lancaster Avenue															
4	L2	All MCs	5	2.0	5	2.0	0.274	5.3	LOS A	1.1	7.8	0.59	0.79	0.66	43.4
5	T1	All MCs	79	3.0	79	3.0	0.274	7.9	LOS A	1.1	7.8	0.59	0.79	0.66	40.3
6	R2	All MCs	75	3.0	75	3.0	0.274	10.9	LOS A	1.1	7.8	0.59	0.79	0.66	43.4
Approach			159	3.0	159	3.0	0.274	9.2	LOS A	1.1	7.8	0.59	0.79	0.66	42.2
North: Wharf Road															
7	L2	All MCs	14	3.0	14	3.0	0.124	5.4	LOS A	0.6	4.0	0.29	0.32	0.29	46.7
8	T1	All MCs	122	3.0	122	3.0	0.124	0.5	LOS A	0.6	4.0	0.29	0.32	0.29	47.9
9	R2	All MCs	81	3.0	81	3.0	0.124	5.4	LOS A	0.6	4.0	0.29	0.32	0.29	44.9
Approach			217	3.0	217	3.0	0.124	2.7	NA	0.6	4.0	0.29	0.32	0.29	47.0
West: Hope Street															
10	L2	All MCs	7	3.0	7	3.0	0.363	6.0	LOS A	1.7	12.2	0.61	0.83	0.77	40.0
11	T1	All MCs	143	3.0	143	3.0	0.363	8.3	LOS A	1.7	12.2	0.61	0.83	0.77	40.4
12	R2	All MCs	78	3.0	78	3.0	0.363	11.2	LOS A	1.7	12.2	0.61	0.83	0.77	40.2
Approach			228	3.0	228	3.0	0.363	9.2	LOS A	1.7	12.2	0.61	0.83	0.77	40.3
All Vehicles			996	3.0	996	3.0	0.363	5.3	NA	1.7	12.2	0.39	0.52	0.44	44.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 01 [Hope St / Wharf Rd (Site Folder: (PM) Background)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

4-leg give way intersection
PM Peak
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wharf Road															
1	L2	All MCs	42	3.0	42	3.0	0.077	4.9	LOS A	0.3	1.9	0.18	0.31	0.18	44.8
2	T1	All MCs	68	3.0	68	3.0	0.077	0.2	LOS A	0.3	1.9	0.18	0.31	0.18	47.9
3	R2	All MCs	34	3.0	34	3.0	0.077	5.1	LOS A	0.3	1.9	0.18	0.31	0.18	46.8
Approach			144	3.0	144	3.0	0.077	2.7	NA	0.3	1.9	0.18	0.31	0.18	47.0
East: Lancaster Avenue															
4	L2	All MCs	1	3.0	1	3.0	0.662	7.7	LOS A	5.8	41.3	0.71	1.04	1.29	42.7
5	T1	All MCs	436	3.0	436	3.0	0.662	10.2	LOS A	5.8	41.3	0.71	1.04	1.29	39.3
6	R2	All MCs	69	3.0	69	3.0	0.662	13.7	LOS A	5.8	41.3	0.71	1.04	1.29	42.7
Approach			506	3.0	506	3.0	0.662	10.6	LOS A	5.8	41.3	0.71	1.04	1.29	40.0
North: Wharf Road															
7	L2	All MCs	52	3.0	52	3.0	0.195	5.0	LOS A	1.0	7.5	0.24	0.37	0.24	46.2
8	T1	All MCs	108	3.0	108	3.0	0.195	0.4	LOS A	1.0	7.5	0.24	0.37	0.24	47.3
9	R2	All MCs	185	3.0	185	3.0	0.195	5.0	LOS A	1.0	7.5	0.24	0.37	0.24	44.1
Approach			345	3.0	345	3.0	0.195	3.5	NA	1.0	7.5	0.24	0.37	0.24	45.7
West: Hope Street															
10	L2	All MCs	8	3.0	8	3.0	0.347	5.5	LOS A	1.6	11.7	0.60	0.77	0.74	39.8
11	T1	All MCs	135	3.0	135	3.0	0.347	7.3	LOS A	1.6	11.7	0.60	0.77	0.74	40.2
12	R2	All MCs	66	3.0	66	3.0	0.347	14.6	LOS B	1.6	11.7	0.60	0.77	0.74	40.0
Approach			209	3.0	209	3.0	0.347	9.5	LOS A	1.6	11.7	0.60	0.77	0.74	40.1
All Vehicles			1205	3.0	1205	3.0	0.662	7.5	NA	5.8	41.3	0.49	0.71	0.76	42.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 01 [Hope St / Wharf Rd (Site Folder: 2027 (AM) Background + PS)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

4-leg give way intersection
2027 AM Peak
Site Category: Proposed
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wharf Road															
1	L2	All MCs	161	1.0	161	1.0	0.313	5.0	LOS A	1.7	12.3	0.27	0.38	0.27	25.1
2	T1	All MCs	196	2.7	196	2.7	0.313	0.4	LOS A	1.7	12.3	0.27	0.38	0.27	47.3
3	R2	All MCs	215	2.3	215	2.3	0.313	5.2	LOS A	1.7	12.3	0.27	0.38	0.27	46.2
Approach			572	2.1	572	2.1	0.313	3.5	NA	1.7	12.3	0.27	0.38	0.27	40.3
East: Lancaster Avenue															
4	L2	All MCs	5	2.0	5	2.0	0.377	6.2	LOS A	1.6	11.8	0.69	0.92	0.92	41.9
5	T1	All MCs	97	2.4	97	2.4	0.377	11.5	LOS A	1.6	11.8	0.69	0.92	0.92	37.8
6	R2	All MCs	75	3.0	75	3.0	0.377	13.6	LOS A	1.6	11.8	0.69	0.92	0.92	41.9
Approach			177	2.7	177	2.7	0.377	12.2	LOS A	1.6	11.8	0.69	0.92	0.92	40.1
North: Wharf Road															
7	L2	All MCs	14	3.0	14	3.0	0.156	6.0	LOS A	0.8	5.6	0.40	0.44	0.40	46.3
8	T1	All MCs	126	2.9	126	2.9	0.156	1.1	LOS A	0.8	5.6	0.40	0.44	0.40	47.4
9	R2	All MCs	109	2.2	109	2.2	0.156	6.0	LOS A	0.8	5.6	0.40	0.44	0.40	28.7
Approach			249	2.6	249	2.6	0.156	3.5	NA	0.8	5.6	0.40	0.44	0.40	39.4
West: Hope Street															
10	L2	All MCs	7	3.0	7	3.0	0.460	7.0	LOS A	2.3	16.2	0.71	0.96	1.05	37.4
11	T1	All MCs	143	3.0	143	3.0	0.460	11.3	LOS A	2.3	16.2	0.71	0.96	1.05	37.7
12	R2	All MCs	78	3.0	78	3.0	0.460	15.2	LOS B	2.3	16.2	0.71	0.96	1.05	37.6
Approach			228	3.0	228	3.0	0.460	12.5	LOS A	2.3	16.2	0.71	0.96	1.05	37.6
All Vehicles			1226	2.4	1226	2.4	0.460	6.4	NA	2.3	16.2	0.44	0.58	0.53	39.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 01 [Hope St / Wharf Rd (Site Folder: 2027 (PM) Background + PS)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

4-leg give way intersection
2027 PM Peak
Site Category: Proposed
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wharf Road															
1	L2	All MCs	148	0.9	148	0.9	0.173	4.9	LOS A	0.7	5.0	0.21	0.41	0.21	25.1
2	T1	All MCs	91	2.3	91	2.3	0.173	0.4	LOS A	0.7	5.0	0.21	0.41	0.21	47.3
3	R2	All MCs	86	1.2	86	1.2	0.173	5.1	LOS A	0.7	5.0	0.21	0.41	0.21	46.2
Approach			325	1.3	325	1.3	0.173	3.7	NA	0.7	5.0	0.21	0.41	0.21	36.5
East: Lancaster Avenue															
4	L2	All MCs	1	3.0	1	3.0	0.848	13.6	LOS A	10.1	72.8	0.87	1.56	2.57	38.8
5	T1	All MCs	454	2.9	454	2.9	0.848	18.8	LOS B	10.1	72.8	0.87	1.56	2.57	33.7
6	R2	All MCs	69	3.0	69	3.0	0.848	21.5	LOS B	10.1	72.8	0.87	1.56	2.57	38.9
Approach			524	2.9	524	2.9	0.848	19.1	LOS B	10.1	72.8	0.87	1.56	2.57	34.7
North: Wharf Road															
7	L2	All MCs	52	3.0	52	3.0	0.223	5.5	LOS A	1.2	8.8	0.38	0.45	0.38	45.8
8	T1	All MCs	108	3.0	108	3.0	0.223	0.9	LOS A	1.2	8.8	0.38	0.45	0.38	46.9
9	R2	All MCs	203	2.7	203	2.7	0.223	5.5	LOS A	1.2	8.8	0.38	0.45	0.38	28.4
Approach			363	2.9	363	2.9	0.223	4.1	NA	1.2	8.8	0.38	0.45	0.38	36.6
West: Hope Street															
10	L2	All MCs	19	1.3	19	1.3	0.429	6.4	LOS A	2.3	16.3	0.69	0.86	0.97	37.5
11	T1	All MCs	135	3.0	135	3.0	0.429	9.6	LOS A	2.3	16.3	0.69	0.86	0.97	37.8
12	R2	All MCs	66	3.0	66	3.0	0.429	19.3	LOS B	2.3	16.3	0.69	0.86	0.97	37.7
Approach			220	2.9	220	2.9	0.429	12.2	LOS A	2.3	16.3	0.69	0.86	0.97	37.8
All Vehicles			1433	2.5	1433	2.5	0.848	10.8	NA	10.1	72.8	0.57	0.91	1.23	36.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 01 [Hope St / Wharf Rd (Site Folder: 2036 (AM) Background + PS)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

4-leg give way intersection
2036 AM Peak
Site Category: Proposed
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wharf Road															
1	L2	All MCs	245	0.6	245	0.6	0.327	4.9	LOS A	1.6	11.4	0.23	0.39	0.23	25.1
2	T1	All MCs	192	2.8	192	2.8	0.327	0.4	LOS A	1.6	11.4	0.23	0.39	0.23	47.3
3	R2	All MCs	175	2.8	175	2.8	0.327	5.2	LOS A	1.6	11.4	0.23	0.39	0.23	46.2
Approach			612	1.9	612	1.9	0.327	3.6	NA	1.6	11.4	0.23	0.39	0.23	37.7
East: Lancaster Avenue															
4	L2	All MCs	5	2.0	5	2.0	0.342	5.9	LOS A	1.4	10.3	0.68	0.90	0.86	42.0
5	T1	All MCs	79	3.0	79	3.0	0.342	12.0	LOS A	1.4	10.3	0.68	0.90	0.86	38.0
6	R2	All MCs	75	3.0	75	3.0	0.342	12.5	LOS A	1.4	10.3	0.68	0.90	0.86	42.0
Approach			159	3.0	159	3.0	0.342	12.0	LOS A	1.4	10.3	0.68	0.90	0.86	40.5
North: Wharf Road															
7	L2	All MCs	14	3.0	14	3.0	0.167	6.4	LOS A	0.9	6.2	0.45	0.50	0.45	46.1
8	T1	All MCs	124	2.9	124	2.9	0.167	1.5	LOS A	0.9	6.2	0.45	0.50	0.45	47.2
9	R2	All MCs	114	2.1	114	2.1	0.167	6.4	LOS A	0.9	6.2	0.45	0.50	0.45	28.6
Approach			252	2.6	252	2.6	0.167	4.0	NA	0.9	6.2	0.45	0.50	0.45	39.0
West: Hope Street															
10	L2	All MCs	7	3.0	7	3.0	0.455	6.9	LOS A	2.2	16.0	0.71	0.96	1.03	37.5
11	T1	All MCs	143	3.0	143	3.0	0.455	11.2	LOS A	2.2	16.0	0.71	0.96	1.03	37.8
12	R2	All MCs	78	3.0	78	3.0	0.455	14.8	LOS B	2.2	16.0	0.71	0.96	1.03	37.7
Approach			228	3.0	228	3.0	0.455	12.3	LOS A	2.2	16.0	0.71	0.96	1.03	37.8
All Vehicles			1251	2.4	1251	2.4	0.455	6.3	NA	2.2	16.0	0.42	0.58	0.50	38.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 01 [Hope St / Wharf Rd (Site Folder: 2036 (PM) Background + PS)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

4-leg give way intersection
2036 PM Peak
Site Category: Proposed
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wharf Road															
1	L2	All MCs	247	0.5	247	0.5	0.193	4.7	LOS A	0.5	3.2	0.12	0.43	0.12	25.1
2	T1	All MCs	82	2.5	82	2.5	0.193	0.3	LOS A	0.5	3.2	0.12	0.43	0.12	47.4
3	R2	All MCs	47	2.1	47	2.1	0.193	5.2	LOS A	0.5	3.2	0.12	0.43	0.12	46.3
Approach			377	1.1	377	1.1	0.193	3.8	NA	0.5	3.2	0.12	0.43	0.12	32.3
East: Lancaster Avenue															
4	L2	All MCs	1	3.0	1	3.0	0.857	14.5	LOS A	10.2	73.1	0.89	1.60	2.70	38.3
5	T1	All MCs	436	3.0	436	3.0	0.857	20.4	LOS B	10.2	73.1	0.89	1.60	2.70	33.0
6	R2	All MCs	69	3.0	69	3.0	0.857	21.2	LOS B	10.2	73.1	0.89	1.60	2.70	38.3
Approach			506	3.0	506	3.0	0.857	20.4	LOS B	10.2	73.1	0.89	1.60	2.70	34.0
North: Wharf Road															
7	L2	All MCs	52	3.0	52	3.0	0.234	5.9	LOS A	1.3	9.3	0.45	0.51	0.45	45.6
8	T1	All MCs	108	3.0	108	3.0	0.234	1.3	LOS A	1.3	9.3	0.45	0.51	0.45	46.8
9	R2	All MCs	199	2.8	199	2.8	0.234	6.0	LOS A	1.3	9.3	0.45	0.51	0.45	28.3
Approach			359	2.9	359	2.9	0.234	4.5	NA	1.3	9.3	0.45	0.51	0.45	36.6
West: Hope Street															
10	L2	All MCs	8	3.0	8	3.0	0.414	6.2	LOS A	2.0	14.7	0.68	0.89	0.95	37.7
11	T1	All MCs	135	3.0	135	3.0	0.414	9.3	LOS A	2.0	14.7	0.68	0.89	0.95	38.1
12	R2	All MCs	66	3.0	66	3.0	0.414	18.1	LOS B	2.0	14.7	0.68	0.89	0.95	37.9
Approach			209	3.0	209	3.0	0.414	11.9	LOS A	2.0	14.7	0.68	0.89	0.95	38.0
All Vehicles			1452	2.5	1452	2.5	0.857	11.0	NA	10.2	73.1	0.55	0.92	1.22	34.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

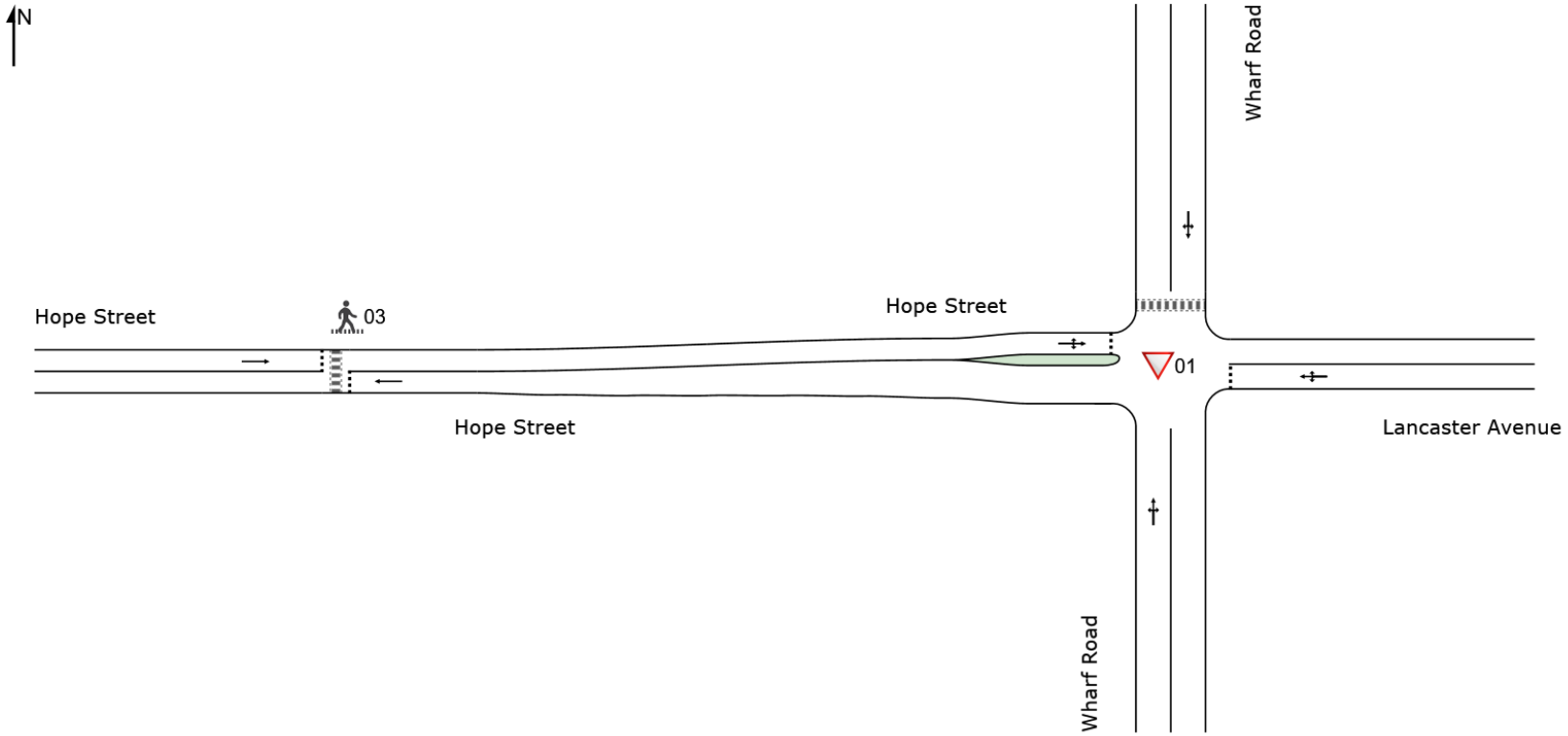
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

NETWORK LAYOUT

Network: N101 [2036 (AM) Background + PS + HS (Network Folder: General)]

New Network
Network Category: (None)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
01	NA	Hope St / Wharf Rd
03	NA	Hope St Crossing

MOVEMENT SUMMARY

Site: 01 [Hope St / Wharf Rd (Site Folder: 2036 (AM) Background + PS + HS)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [2036 (AM) Background + PS + HS (Network Folder: General)]

4-leg give way intersection
2036 AM Peak
Site Category: Proposed
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wharf Road															
1	L2	All MCs	245	0.6	245	0.6	0.411	5.2	LOS A	1.2	8.6	0.32	0.40	0.32	44.6
2	T1	All MCs	192	2.8	192	2.8	0.411	0.8	LOS A	1.2	8.6	0.32	0.40	0.32	47.1
3	R2	All MCs	175	2.8	175	2.8	0.411	5.3	LOS A	1.2	8.6	0.32	0.40	0.32	46.0
Approach			612	1.9	612	1.9	0.411	3.9	NA	1.2	8.6	0.32	0.40	0.32	46.1
East: Lancaster Avenue															
4	L2	All MCs	5	2.0	5	2.0	0.362	6.2	LOS A	0.6	4.4	0.70	0.92	0.91	41.6
5	T1	All MCs	79	3.0	79	3.0	0.362	12.2	LOS A	0.6	4.4	0.70	0.92	0.91	37.2
6	R2	All MCs	75	3.0	75	3.0	0.362	14.0	LOS A	0.6	4.4	0.70	0.92	0.91	41.7
Approach			159	3.0	159	3.0	0.362	12.8	LOS A	0.6	4.4	0.70	0.92	0.91	40.1
North: Wharf Road															
7	L2	All MCs	14	3.0	14	3.0	0.236	4.9	LOS A	0.5	3.5	0.34	0.35	0.34	46.3
8	T1	All MCs	124	2.9	124	2.9	0.236	0.6	LOS A	0.5	3.5	0.34	0.35	0.34	47.5
9	R2	All MCs	114	2.1	114	2.1	0.236	7.2	LOS A	0.5	3.5	0.34	0.35	0.34	45.3
Approach			252	2.6	252	2.6	0.236	3.8	NA	0.5	3.5	0.34	0.35	0.34	46.8
West: Hope Street															
10	L2	All MCs	7	3.0	7	3.0	0.455	7.3	LOS A	0.9	6.4	0.72	0.96	1.04	37.5
11	T1	All MCs	143	3.0	143	3.0	0.455	11.2	LOS A	0.9	6.4	0.72	0.96	1.04	37.8
12	R2	All MCs	78	3.0	78	3.0	0.455	14.8	LOS B	0.9	6.4	0.72	0.96	1.04	37.7
Approach			228	3.0	228	3.0	0.455	12.3	LOS A	0.9	6.4	0.72	0.96	1.04	37.8
All Vehicles			1251	2.4	1251	2.4	0.455	6.5	NA	1.2	8.6	0.45	0.56	0.53	44.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 01 [Hope St / Wharf Rd (Site Folder: 2036 (PM) Background + PS + HS)]

Output produced by SIDRA INTERSECTION Version: 9.1.5.224

Network: N101 [2036 (PM) Background + PS + HS (Network Folder: General)]

4-leg give way intersection
2036 PM Peak
Site Category: Proposed
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Wharf Road															
1	L2	All MCs	247	0.5	247	0.5	0.229	4.9	LOS A	0.5	3.5	0.22	0.42	0.22	44.6
2	T1	All MCs	82	2.5	82	2.5	0.229	0.6	LOS A	0.5	3.5	0.22	0.42	0.22	47.1
3	R2	All MCs	47	2.1	47	2.1	0.229	5.2	LOS A	0.5	3.5	0.22	0.42	0.22	46.0
Approach			377	1.1	377	1.1	0.229	4.0	NA	0.5	3.5	0.22	0.42	0.22	45.7
East: Lancaster Avenue															
4	L2	All MCs	1	3.0	1	3.0	0.871	15.6	LOS B	4.3	31.1	0.90	1.66	2.88	37.8
5	T1	All MCs	436	3.0	436	3.0	0.871	21.5	LOS B	4.3	31.1	0.90	1.66	2.88	31.5
6	R2	All MCs	69	3.0	69	3.0	0.871	23.7	LOS B	4.3	31.1	0.90	1.66	2.88	37.8
Approach			506	3.0	506	3.0	0.871	21.8	LOS B	4.3	31.1	0.90	1.66	2.88	32.9
North: Wharf Road															
7	L2	All MCs	52	3.0	52	3.0	0.309	5.0	LOS A	0.7	4.9	0.36	0.42	0.36	45.8
8	T1	All MCs	108	3.0	108	3.0	0.309	0.7	LOS A	0.7	4.9	0.36	0.42	0.36	47.0
9	R2	All MCs	199	2.8	199	2.8	0.309	6.7	LOS A	0.7	4.9	0.36	0.42	0.36	44.4
Approach			359	2.9	359	2.9	0.309	4.6	NA	0.7	4.9	0.36	0.42	0.36	45.7
West: Hope Street															
10	L2	All MCs	8	3.0	8	3.0	0.415	6.5	LOS A	0.8	5.7	0.67	0.92	0.94	37.8
11	T1	All MCs	135	3.0	135	3.0	0.415	9.2	LOS A	0.8	5.7	0.67	0.92	0.94	38.1
12	R2	All MCs	66	3.0	66	3.0	0.415	17.9	LOS B	0.8	5.7	0.67	0.92	0.94	38.0
Approach			209	3.0	209	3.0	0.415	11.8	LOS A	0.8	5.7	0.67	0.92	0.94	38.1
All Vehicles			1452	2.5	1452	2.5	0.871	11.5	NA	4.3	31.1	0.56	0.93	1.28	39.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

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