# Greater Parramatta and Olympic Peninsula (GPOP) Water Cycle Management

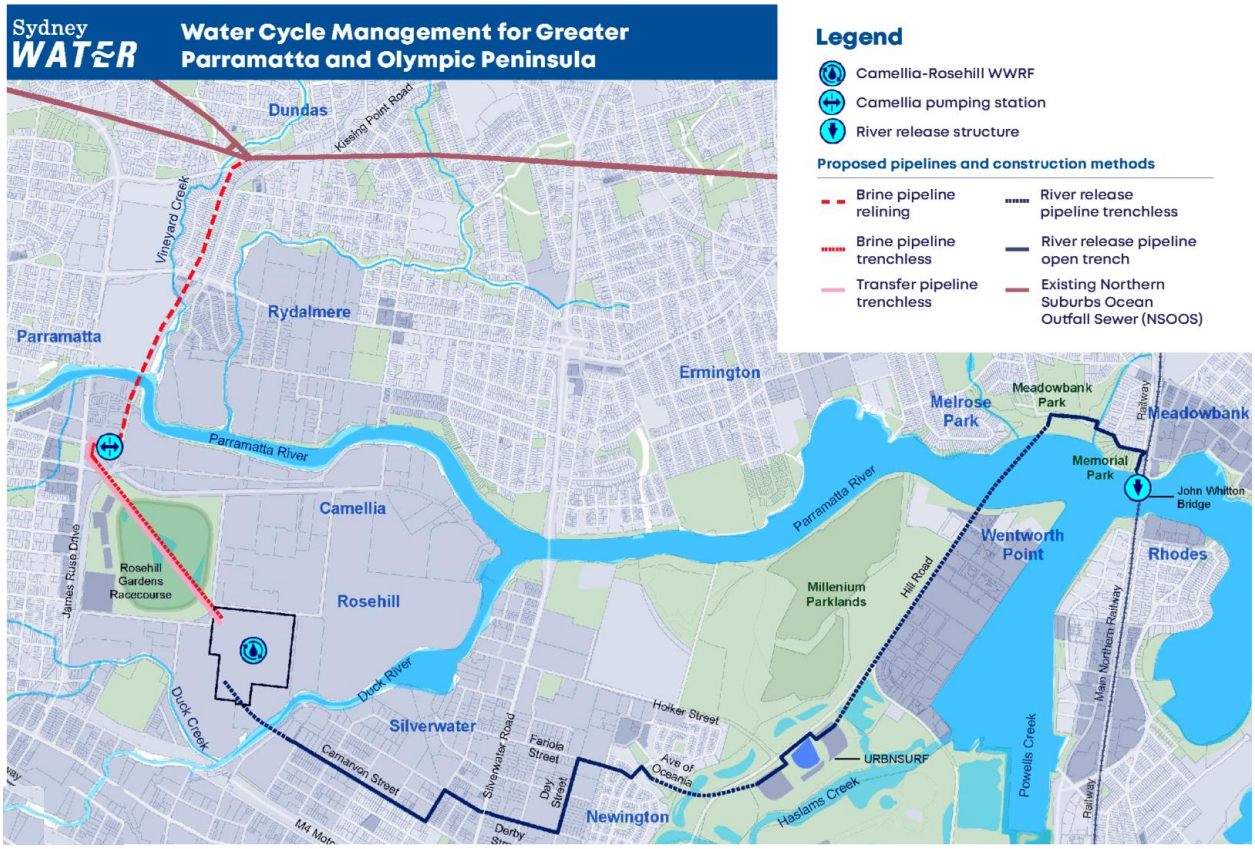
## Traffic and Transport Impact Assessment

10 December 2025

Prepared for: Sydney Water

Prepared by: Stantec Australia Pty Ltd

Project: 300305541

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# Revision Schedule

| Revision No. | Date | Description | Prepared by | Reviewed by | Approved by |
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# Glossary of Terms and Abbreviations

| Abbreviation | Meaning |
|---|---|
| **AS** | Australian Standard |
| **CBD** | Central Business District |
| **CTMP** | Construction Traffic Management Plan |
| **DoS** | Degree of Saturation |
| **DCP** | Development Control Plan |
| **DPHI** | Department of Planning, Housing and Infrastructure (previously NSW Department of Planning and Environment, DPE) |
| **EIS** | Environmental Impact Statement |
| **GPOP** | Greater Parramatta and Olympic Peninsula |
| **GFA** | Gross Floor Area |
| **HV** | Heavy Vehicles |
| **Ha** | Hectares |
| **LoS** | Level of Service |
| **LV** | Light Vehicles |
| **LEP** | Local Environmental Plan |
| **LGA** | Local Government Area |
| **ML/d** | Megalitres per day |
| **Movements** | Single trip travelling one way towards or away from a destination (e.g. a worker travelling to site and then back home would equate to two movements) |
| **NHVR** | National Heavy Vehicle Regulator |
| **NSOOS** | Northern Suburbs Ocean Outfall Sewer |
| **OSOM** | Oversize and/ or Overmass |
| **PLR** | Parramatta Light Rail |
| **RO** | Reverse Osmosis |
| **RMS** | Roads and Maritime Services |
| **RTA** | Road Traffic Authority |
| **RUM** | Road User Movement |
| **SEARs** | Secretary's Environmental Assessment Requirements |
| **SSCTMPs** | Site Specific Construction Traffic Management Plans |
| **TGS** | Traffic Guidance Scheme |
| **TfNSW** | Transport for New South Wales |
| **WRRF** | Water Resource Recovery Facility |
| **WSU** | Western Sydney University |
| **WSU - PC** | Western Sydney University – Parramatta Campus |

# Executive Summary

Sydney Water is planning to build and operate a new Water Resource Recovery Facility (WRRF) to service the Greater Parramatta and Olympic Peninsula (GPOP) area. The WRRF is designed to reduce pressure on existing systems such as the Northern Suburbs Ocean Outfall Sewer (NSOOS), which is nearing capacity and supports future growth in the GPOP corridor. The proposed infrastructure is being developed in response to the growing demand for wastewater services in the GPOP area, a region undergoing significant urban transformation. As population and development intensify across this corridor, the need for a localised and resilient water cycle solution has become increasingly critical. The initiative centres on a new facility in Camellia-Rosehill that is designed to treat and recover wastewater, supported by a network of pipelines and upgrades to existing assets. The study explores how this project interacts with the surrounding transport network, considering both construction and operational phases within the context of regional planning and infrastructure delivery.

The surrounding strategic environment includes several major transport projects that are reshaping connectivity across Western Sydney. These include the Parramatta Light Rail Stage 2, Sydney Metro West and the Duck River Nature Trail, each contributing to increased movement and accessibility in the area. The Camellia–Rosehill precinct itself is subject to a place strategy that envisions a shift from industrial land uses to a mixed-use urban centre. These overlapping initiatives form the backdrop against which the project and its transport implications are assessed.

The project spans multiple components, including the WRRF, a transfer pipeline, a brine pipeline, a river release pipeline and upgrades to the existing Camellia pumping station. These elements are distributed across a wide area, intersecting with various land uses and transport corridors.

To understand the transport implications of the project, a multi-layered methodology was applied. This included traffic surveys, intersection modelling and growth projections, with particular attention given to peak construction years. The analysis also considered cumulative impacts from other infrastructure projects in the area and classified transport impacts by their level of significance.

The existing conditions in the study area reveal a complex road network comprising arterial, sub-arterial and local roads. Several intersections already experience high levels of congestion and delay. Public transport services are present but vary in accessibility, while active transport infrastructure is limited and fragmented. Safety data indicates some areas of concern, particularly at key intersections surrounding the WRRF site.

Construction activities are expected to span approximately three and a half years, involving trenching, horizontal directional drilling and compound establishment across multiple sites. Vehicle movements would include both light and heavy vehicles, with peak volumes concentrated around the WRRF. Work hours would generally follow standard construction periods, with some anticipated night and weekend work to minimise disruption.

Notably, early environmental management work has already been undertaken at the WRRF site. This has involved bringing natural material to the site to raise the site to reduce interaction with residual contamination, and for flooding.

Traffic impacts during construction were assessed in detail, particularly at intersections expected to carry the highest volumes of construction traffic. Modelling results indicate that while some intersections are already operating near or over capacity, the additional traffic generated by the project would not

materially worsen the conditions beyond existing constraints and can also be mitigated through certain traffic management measures. Pipeline construction impacts were reviewed section by section, with considerations for safety, public transport, active transport, parking and property access.

Once operational, the WRRF is expected to generate significantly lower traffic volumes compared to the construction phase. Daily movements would be limited to staff journeys and occasional deliveries, with all parking and deliveries contained on-site. The surrounding road network is expected to accommodate the forecast traffic volumes without adverse impacts and no significant impacts are anticipated on public transport or active transport infrastructure.

The timing of the WRRF's construction and operation avoids the peak construction work periods of major projects being completed in the area. Notably, the peak construction works for Parramatta Light Rail Stage 2 and Sydney Metro West are expected to be complete before the WRRF begins service, reducing the likelihood of overlapping peak traffic impacts. Cumulative impacts were accounted for in the modelling to ensure a conservative assessment.

Mitigation measures have been identified to manage construction-related impacts, including traffic control, signage, partial lane closures and temporary relocation of bus stops. These measures are tailored to each worksite and would be refined through site-specific traffic management plans.

# 1 Introduction

## 1.1 Project Description

Sydney Water is planning to build and operate a new Water Resource Recovery Facility (WRRF) to service the Greater Parramatta and Olympic Peninsula (GPOP) area and growth across northern Sydney. GPOP has been identified as a key economic growth corridor and this growth would result in increased demand for wastewater services. About 75% of wastewater generated in the GPOP corridor is currently transferred via the Northern Suburbs Ocean Outfall Sewer (NSOOS) to the North Head WRRF. Increased growth in GPOP would place increased pressure on the NSOOS and North Head WRRF. Building a new WRRF to service GPOP would avoid the substantial impacts and costs of duplicating the NSOOS (which would be required by 2031) and expansion of the North Head WRRF.

Further details of each component of the project are provided in the following section.

Notably and separate to this project, Sydney Water has also acquired a site within the Camellia-Rosehill precinct to support the growth. Works have been undertaken to raise part of the site up to 1.7m with imported natural material. These works commenced in early 2025 and are expected to finish early 2026.

### 1.1.1 Project Elements

Key elements of the project would include:

- a new WRRF at Camellia-Rosehill to treat wastewater to produce advanced treated water
- upgrades to the existing pumping station at Camellia
- a new wastewater transfer pipeline from Camellia pumping station to the WRRF
- a new and repurposed brine pipeline to transfer brine from the WRRF to the NSOOS
- a new river release pipeline to transfer advanced treated water from the WRRF to a release structure in the Parramatta River at Meadowbank.

## 1.2 Purpose of this Report

This report outlines the traffic and transport impacts associated with the project and mitigation measures required during construction and operation to address the impacts identified to support the Environmental Impact Statement (EIS).

## 1.3 Legislative and Policy Context

This report has been prepared in accordance with the legislation and policies detailed in Table 1.1.

**Table 1.1: Relevant Legislation and Policies**

| **Legislation and Policies relevant to the Traffic and Transport Technical Report** | | |
|---|---|---|
| **Legislation/ Policy** | **Description** | **Relevance** |
| Road Acts 1993 (NSW Government, 2025) | Sets out the legal classification of roads, their ownership and responsibility for maintenance. | The classification of roads near the site and respective pipelines has been identified. Furthermore, the ownership of these roads and responsibility for maintenance has also been identified, as required based on this document. |
| Walking Space Guide: Towards Pedestrian Comfort and Safety (TfNSW, 2020) | This guide developed by TfNSW provides a set of standards and tools to assist those responsible for the design of walking spaces on streets, to ensure that sufficient space is provided to achieve comfortable environments which encourage people to walk. | Safe environments for detours during construction works (wherever possible) have been mentioned throughout the report to promote pedestrian safety. |
| Cycleway Design Toolbox: Designing for Cycling and Micromobility (TfNSW, 2020) | The aim of this document is to provide guidance for practitioners on how to design for cycling and micromobility in the context of New South Wales and Greater Sydney. | Safe environments for detours during construction works (wherever possible) have been mentioned throughout the report to promote safety for cyclists. |
| NSW Road Rules 2014 (NSW Government 2025) | Sets out the signage, posted speed limits and road rules that apply to vehicles and road users on roads and road related areas. | This document has been prepared with consideration to these road rules and the respective regulations. |
| TfNSW Traffic Control at Work Sites – Technical Manual (TfNSW, 2022) | The manual aims to improve the safety of road workers and road users at road work sites in NSW. | There are construction elements in this project and this document has been prepared with consideration to this technical manual to promote the safety of road workers and road users within the respective work sites. |
| Guide to Transport Impact Assessment – Technical Guidance for Transport Practitioners (TfNSW, 2024) | The Guide examines how to assess traffic generating developments and identify impacts upon the wider transport network. The level of assessment can vary depending on the type of development. | This project is a traffic generating development. Therefore, this Guide has been used as it provides the appropriate methodology for assessing all types of traffic generating developments. |
| Guide to Traffic Management Part 12: Traffic Impacts of Developments (Austroads, 2009) | The document guides planners and engineers who design, develop and manage a variety of land use developments in identifying and managing the impacts on the transport network arising from these developments. | This project is a traffic generating development. Therefore, this Guide has been used as it provides the appropriate methodology for assessing all types of traffic generating developments. |
| Traffic Modelling Guidelines (Roads and Maritime Services, 2013) (RMS) | This document provides guidance to develop consistency in traffic modelling practice and promote high quality, accurate model outputs. | This document dictates the appropriate methodology for traffic modelling conducted as part of this assessment. |
| Road Design Guide (RTA, 1988) | The purpose of this document is to provide guidelines to ensure that there is a consistent and safe approach to road design. | This document outlines the appropriate design standards for new and adjusted intersections and has been used by the wider design team. |

| Legislation and Policies relevant to the Traffic and Transport Technical Report | | |
|---|---|---|
| **Legislation/ Policy** | **Description** | **Relevance** |
| Australian/New Zealand Standard, Parking Facilities (AS 2890) | The purpose of this document is to provide guidelines to ensure there is a consistent and safe approach to car parking design. | This document outlines the design requirements for off-street car parking spaces and loading bays that workers would utilise for both the construction and operational phases. |
| Local environmental Planning Instruments (Local Environmental Plans) | Local Environmental Plans are prepared by local councils. They guide the planning decisions for local governments by outlining a framework for permissible development and land use zoning. | Under section 5.22 of the EP&A Act, environmental planning instruments (EPIs) do not typically apply to SSI projects. Sydney Water has carried out engagement with City of Parramatta Council and City of Ryde Council during design development for the project to align with planning and environmental priorities. |
| Development Control Plans (DCPs) | Development Control Plans support Local Environmental Plans. They guide the detailed planning and design for developments proposed within the relevant Local Government Area (LGA). | Sydney Water has carried out extensive engagement with City of Parramatta and City of Ryde Councils on the concept design for the project. Where reasonable and feasible, Sydney Water has sought to align with the objectives and controls of the City of Parramatta DCP (2023). Sydney Water would continue to engage with both Councils throughout the detailed design process for the project. |

## 1.4 Secretary's Environmental Assessment Requirements (SEARs)

This report sets out an assessment of the anticipated transport implications of the proposed GPOP Water Cycle Management project. Furthermore, the report has considered the transport conditions on the surrounding road network for construction and operation of the project to ensure the surrounding road network can accommodate the proposed project.

The report addresses the Department of Planning, Housing and Infrastructure (DPHI) requirements for transport and accessibility impacts (construction and operational) that are included in the Secretary's Environmental Assessment Requirements (SEARs), as referenced in Table 1.2.

**Table 1.2: Secretary's Environmental Assessment Requirements**

| SEARs Requirement | Location in this Report |
|---|---|
| **Construction transport and traffic (vehicle, pedestrian and cyclist) impacts, including, but not necessarily limited to:** | |
| • a considered approach to route identification and scheduling of construction vehicle movements | Refer to Sections 3.1, 3.2, 6.7, 6.8 and 7.1.3. |
| • the indicative number, frequency and size of construction related vehicles (passenger, commercial and heavy vehicles, including spoil management movements) accessing each construction ancillary facility and travelling along construction traffic routes during both standard hours and out-of-hours | Refer to Sections 6.6, 6.7, 6.8, 7.1.3, 7.2 and 7.3. |
| • construction worker parking | Refer to Sections 6.5, 7.2 and 7.3. |
| • the nature of existing traffic (types and number of movements) on construction access routes (including consideration of peak traffic times and sensitive road users and parking arrangements) | Refer to Sections 3.4, 5.1.3, 5.2 and 5.3. |
| • access constraints and impacts on public transport (infrastructure and services), pedestrians and cyclists | Refer to Sections 5.4, 5.5, 7.2 and 7.3. |
| • the need to close, divert or otherwise reconfigure elements of the road, pedestrian and cycle network, duration of these changes, with a specific emphasis on impacts on the Duck River Nature Trails project and measures for retaining pedestrian and cyclists access | Refer to Sections 4.5, 5.5, 7.2 and 7.3. |
| • a cumulative impact assessment taking into consideration the delivery of Parramatta Light Rail Stage 2 and Sydney Metro projects, including but not limited to road works, road closures, haulage routes, and construction worker parking. | Refer to Sections 3.5, 7.1.2 and 9.1. |
| **Operational traffic and transport arrangements and impacts of the project, including:** | |
| • forecast traffic volumes for the project and the surrounding road | Refer to Section 8.1. |
| • impacts on property and business access and on-street parking | Refer to Section 8.2.3. |
| • impacts on the Duck River Nature Trails and any measures to maintain public access | Refer to Section 8.2.4. |
| • details on the maximum size of vehicles that would be servicing the facility and demonstration that adequate access is provided | Refer to Section 8.1.2. |
| • impacts on the delivery and operation of Parramatta Light Rail Stage 2 and Sydney Metro projects | Refer to Section 9.2. |

# 2 Project Overview

Sydney Water is proposing to build and operate a new WRRF at Camellia-Rosehill. The new WRRF is needed to provide additional wastewater capacity to support growth across the northern suburbs of Sydney and in the GPOP growth corridor. The WRRF and associated infrastructure together form the GPOP Water Cycle Management project.

Without the proposed project, the additional growth would place pressure on the existing northern suburbs wastewater network, which includes the NSOOS and the North Head WRRF. These critical assets provide wastewater services to around 1.7 million people and with current growth, projections indicate the network would reach capacity by 2031.

The GPOP project has been designed to be efficient, sustainable and cost effective for the community, as well as resilient and adaptable for future water uses.

The main elements of the project include:

- a new WRRF at Camellia-Rosehill to treat wastewater to produce advanced treated water
- upgrades to the existing pumping station at Camellia
- a new wastewater transfer pipeline from Camellia pumping station to the WRRF
- a new and repurposed brine pipeline to transfer brine from the WRRF to the NSOOS (between the WRRF and Camellia pumping station the brine pipeline would follow the same alignment as the transfer pipeline, while between Camellia pumping station and the NSOOS an existing pipeline would be relined)
- a new river release pipeline to transfer advanced treated water from the WRRF to a release structure in the Parramatta River at Meadowbank.

The locations of the main elements of the project are provided in Figure 2-1.

The project is considered State significant infrastructure and Sydney Water is preparing an EIS to support an application to the Minister for Planning and Public Spaces.

**Figure 2-1: Subject Site and Its Environs**


Source: GPOP Geospatial Hub, EIS MapApp, Jacobs & Sydney Water, accessed July 2025

Further details of each component of the project are provided in Table 2.1.

**Table 2.1: Project Description**

| Project Component | Detailed Description |
|---|---|
| WRRF | The WRRF would have capacity to treat 70 megalitres per day (ML/d). The WRRF would produce advanced treated water to minimise impacts on receiving waterways. The reverse osmosis (RO) treatment process within the WRRF would generate brine as a by-product.<br>The main components of the WRRF include:<br>• inlet works<br>• primary, secondary and tertiary wastewater treatment process units<br>• advanced treatment processes involving reverse osmosis<br>• disinfection systems<br>• biosolids handling facilities<br>• odour control facilities.<br>The WRRF would require a range of process infrastructure such as tanks, bioreactors and digestors. The operation of the WRRF would also require ancillary facilities such as an administration building and associated car park, chemical storage and stormwater infrastructure. |
| Camellia pumping station upgrades | The existing Camellia pumping station would be upgraded to divert wastewater to the WRRF. Upgrades would include the installation of new pumps to deliver wastewater flows to the new WRRF while remaining pumps would pump excess existing flows and brine produced by the WRRF to the NSOOS via existing pressure mains. New connections would be installed to divert the wastewater into the transfer pipeline. The existing site sheds would be replaced with a new electrical switch room along the eastern boundary of the site. |
| Transfer pipeline | The transfer pipeline is about 2.2 kilometres in length and would transfer wastewater from the Camellia pumping station to the WRRF. |
| Brine pipeline | The brine pipeline is about 5.2 kilometres in length and would transfer brine from the WRRF to the NSOOS for treatment and offshore discharge at North Head WRRF. A new pipeline would be constructed between the WRRF and Camellia pumping station, along the same alignment as the transfer pipeline. Between the Camellia pumping station and the NSOOS, the brine pipeline would repurpose an existing pipeline. |
| River release pipeline and release structure | The river release pipeline is about 7.6 kilometres in length commencing at the WRRF and travelling through the suburbs of Silverwater, Newington, Sydney Olympic Park and Meadowbank. The river release pipeline would discharge advanced treated water into the Parramatta River at Meadowbank.<br>Above ground infrastructure includes 2 concrete bridge-style aerial crossings over minor waterways in Meadowbank Park, and an approximately 8-metre-high barometric loop located near the existing toilet block in Memorial Park.<br>The river release structure involves 8 smaller pipelines that extend out underneath the sandstone sea wall and along the riverbed of the Parramatta River. The pipelines would vary in length, with the longest extending about 130 m. Diffusers would release water to enable mixing. |

| Project Component | Detailed Description |
|---|---|
| Land ownership and location | The WRRF would be located on Sydney Water owned property at the intersection of Colquhoun and Devon Street, Rosehill (Lot 1, Deposited Plan 1308385). The WRRF site comprises an area of 21.41 hectares (ha) and is located within the City of Parramatta LGA.<br>Upgrades to the existing sewage pumping station at Camellia are also located on Sydney Water property within the City of Parramatta LGA.<br>Pipeline alignments are generally within the road corridor, Council or Crown land or Sydney Water easements, except for the transfer and brine pipelines beneath Rosehill Gardens Racecourse. |
| Construction activities | Key activities for construction of the WRRF would include:<br>• site establishment<br>• delivery of materials<br>• earthworks<br>• civil works<br>• structure construction<br>• installation of mechanical and electrical plant and equipment<br>• landscaping and rehabilitation<br>• commissioning.<br>The new sections of pipelines from the WRRF to the Camellia pumping station and the river release location would be constructed using a combination of trenching and horizontal directional drilling (HDD) techniques. Between Camellia pumping station and the NSOOS, the existing rising main would be relined and repurposed to form part of the brine pipeline.<br>The upgrade of Camellia pumping station would include augmentation of underground infrastructure, the installation of pumps and an upgrade of the power supply. |

# 3 Assessment Methodology

The methodology for this report was developed using the legislation/ guidelines presented in Section 1.3 and the SEARs presented in Section 1.4. The following general methodology was undertaken to assess the construction and operational impacts of this project:

- Review available data and documentation to understand the transport requirements of the project during its construction and operation
- Use historical traffic data and commission additional traffic surveys to understand existing traffic conditions on the surrounding road network and form an existing and future baseline for the assessment
- Review other construction projects that overlap with the programme of this project (particularly Parramatta Light Rail (PLR) and Sydney Metro West) for their cumulative impact on the surrounding road network.

## 3.1 Study Area

With regards to the study area, the impacts to the WRRF site were assessed by assessing the daily and peak hour construction volumes at the following intersections:

- Grand Avenue/ James Ruse Drive
- Grand Avenue/ Colquhoun Street
- Wentworth Street/ Parramatta Road.

These volumes were then modelled within SIDRA INTERSECTION to assess and mitigate the respective impacts.

In terms of the transfer, brine and river release pipelines, the traffic impacts along a catchment of 5 to 10 kilometres for these pipeline sections were assessed and categorised with a focus on areas along the project alignment that would experience surface impacts. Mitigation measures were then outlined to lessen the respective impacts at these sections. Areas that would not experience surface impacts (i.e. the areas where horizontal directional drilling (HDD) is proposed) have not been considered as part of the impact area for this assessment.

This methodology has been detailed further in the following sections and the impacts have been explored within Section 7, Section 8 and Section 9 with mitigation measures outlined in Section 10.

## 3.2 Construction Impact Assessment

With regards to the construction impact assessment, a quantitative assessment was undertaken to assess the specific impacts within the study area for the respective parts of the project; WRRF site, transfer and brine pipelines and river release pipeline. The methodology for the construction impact assessment is outlined below:

- Understand the traffic generation at the peak construction phase of this project which includes an analysis of light and heavy vehicles moving to and from the respective areas
- Distribute the expected traffic volumes onto the road network within the study area including consideration of access to the site compounds
- Undertake SIDRA INTERSECTION modelling for the following three intersections, which comprise those locations that are anticipated to experience the highest volume of traffic movements as part of the project (construction of the WRRF):
    - Grand Avenue/ James Ruse Drive
    - Grand Avenue/ Colquhoun Street
    - Wentworth Street/ Parramatta Road

  Notably, the construction traffic volumes entering or exiting the transfer, brine and river release pipeline areas are relatively low compared to the volumes entering or exiting the WRRF area. They are not expected to cause significant traffic impacts at the intersections near the other construction compound sites within the study area. Accordingly, modelling using SIDRA INTERSECTION has not been undertaken at any other intersections.
- Assess the level of impact using modelling parameters such as Degree of Saturation (DoS) and Level of Service (LoS) (which are discussed in more detail in Section 5.2)
- Identify any impacts (including an analysis of TfNSW's most recent crash statistics from 2019 to 2023) to the road network, public transport inclusive of maritime services, walking and cycling infrastructure associated with access to the compounds located within the vicinity of the brine, transfer and river release pipelines. The impacts would be classified according to level of significance (low, medium or high) as follows:
    - Low indicates minimal impact (due to low volume of movements) and therefore mitigation measures are likely not required.
    - Medium indicates likely impacts to the road network, however, these are generally more localised. It is recommended that these impacts be monitored prior to implementation of mitigation measures
    - High indicates impacts that may cover larger areas along the project corridor. Impacts classified as high would require mitigation measures.
- Develop mitigation measures to manage identified impacts
- Produce a Framework Construction Traffic Management Plan to outline appropriate traffic management controls for the construction phase of the project.

Due to the size and progressive nature of construction works, the quantitative assessment has utilised forecasted construction traffic movements. These movements represent the highest traffic volumes likely to be experienced within the study area (i.e. worst-case scenario).

## 3.3 Operational Impact Assessment

With regards to the operational impact assessment, a qualitative assessment was undertaken. This is because only the WRRF would generate additional traffic once the project is operational and the associated volume of light and heavy vehicle movements is expected to be low. The following methodology was undertaken to assess the operational impacts:

- Identify access routes to the project during its operation (predominantly the WRRF) considering the suitability of roads and any restrictions
- Understand the operational traffic generation related to the WRRF and assess its impacts
- Identify any impacts to other modes (such as public and active transport infrastructure)
- Recommend transport provisions relating to the WRRF operations
- Develop mitigation measures to manage identified impacts (if required).

## 3.4 Assessment Scenarios

To identify the traffic and transport impacts associated with the project, the following scenarios were assessed for the three intersections, as outlined below:

- **2025 baseline** – represents the existing traffic volumes in 2025 considering background traffic and other infrastructure schemes
    - Notably, the survey data provided to Stantec incorporates the construction traffic generation of PLR Stage 2 and Sydney Metro West since construction works for both projects are currently ongoing
- **2028 baseline** – represents the estimated traffic volumes in 2028 considering background traffic growth and other infrastructure schemes, as this is when the peak construction for this project would occur
    - The background traffic growth for the future year scenario (2028) was found by reviewing a nearby traffic counter (Station ID: 47024) and analysing the growth between 2021 to 2025, as these years and resulting traffic numbers were not impacted by COVID-19 (and the working from home mandate). In this regard, the background traffic growth was found to be approximately 1.1 percent. However, as a worst-case a conservative growth factor of 1.5 percent has been adopted in developing the future 2028 baseline.
- **2028 with construction traffic** – the 2028 baseline scenario with the addition of construction traffic volumes relating to the project.

Construction works are expected to be completed in 2031. This is when the operational traffic generation for the WRRF would commence, with the impacts of this explored further within Section 8.

## 3.5 Developing Traffic Baseline

### 3.5.1 Surrounding Intersections

The following intersections currently exist in the vicinity of the WRRF (as displayed in Figure 3-1) and have been selected on the basis that most construction and operational vehicles would travel through them to access the WRRF:

- Grand Avenue/ James Ruse Drive (signalised),
- Grand Avenue/ Colquhoun Street (unsignalised),
- Parramatta Road/ Wentworth Street (signalised).

The vehicle routes to the WRRF are detailed further in Section 6.8.1.

These intersections have been modelled within SIDRA INTERSECTION, noting that site observations indicate that there may be long queues, average delays and capacity constraints currently occurring at the signalised intersections. The modelling results for these intersections are therefore expected to represent a worst-case, conservative scenario as the largest number of workforce and associated vehicles would be accessing the WRRF to complete the construction works.

**Figure 3-1: Surrounding Intersections**


Source: Nearmap, accessed May 2025
**Note:** Not to scale

### 3.5.2 Traffic Survey Data and Peak Hour Analysis

Transport for NSW (TfNSW) provided traffic survey counts that were undertaken by Matrix Traffic and Transport Data at the following intersections between 6:00 am & 10:00 am and 3:00 pm & 7:00 pm on 25 February 2025:

- Grand Avenue/ James Ruse Drive,
- Parramatta Road/ Wentworth Street.

The network peak hours for the traffic count data were between:

- **AM Peak:** 7:00 am to 8:00 am
- **PM Peak:** 5:15 pm to 6:15 pm.

Traffic counts were then undertaken by Stantec during these peak hours at the Grand Avenue/ Colquhoun Street intersection on 8 May 2025.

Traffic summary diagrams indicating the existing base case scenario volumes in 2025 for the AM and PM peak periods are shown in Figure 3-2 and Figure 3-3.

**Figure 3-2: Existing Base Case (2025) - AM Peak Hour Traffic Volumes**

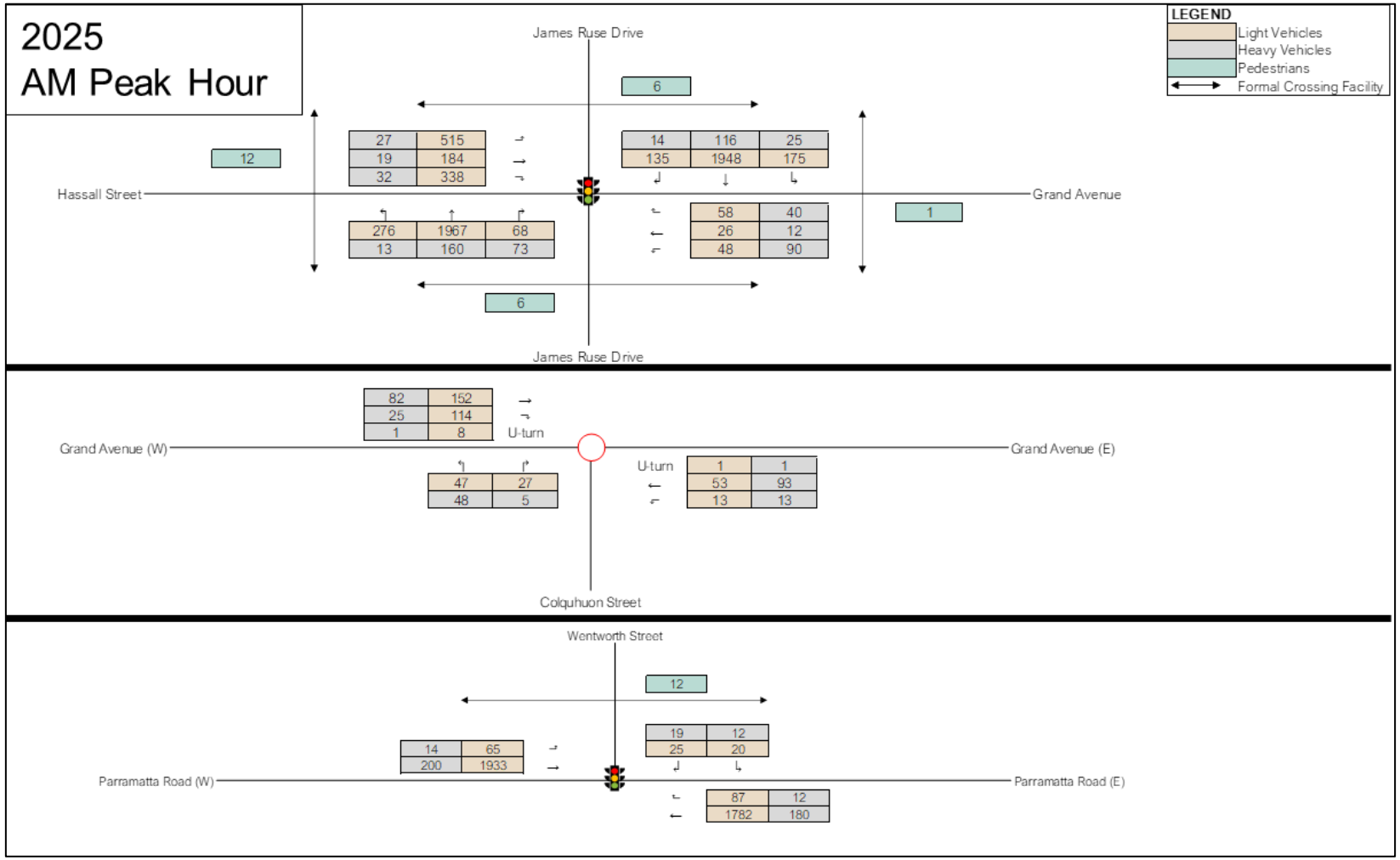
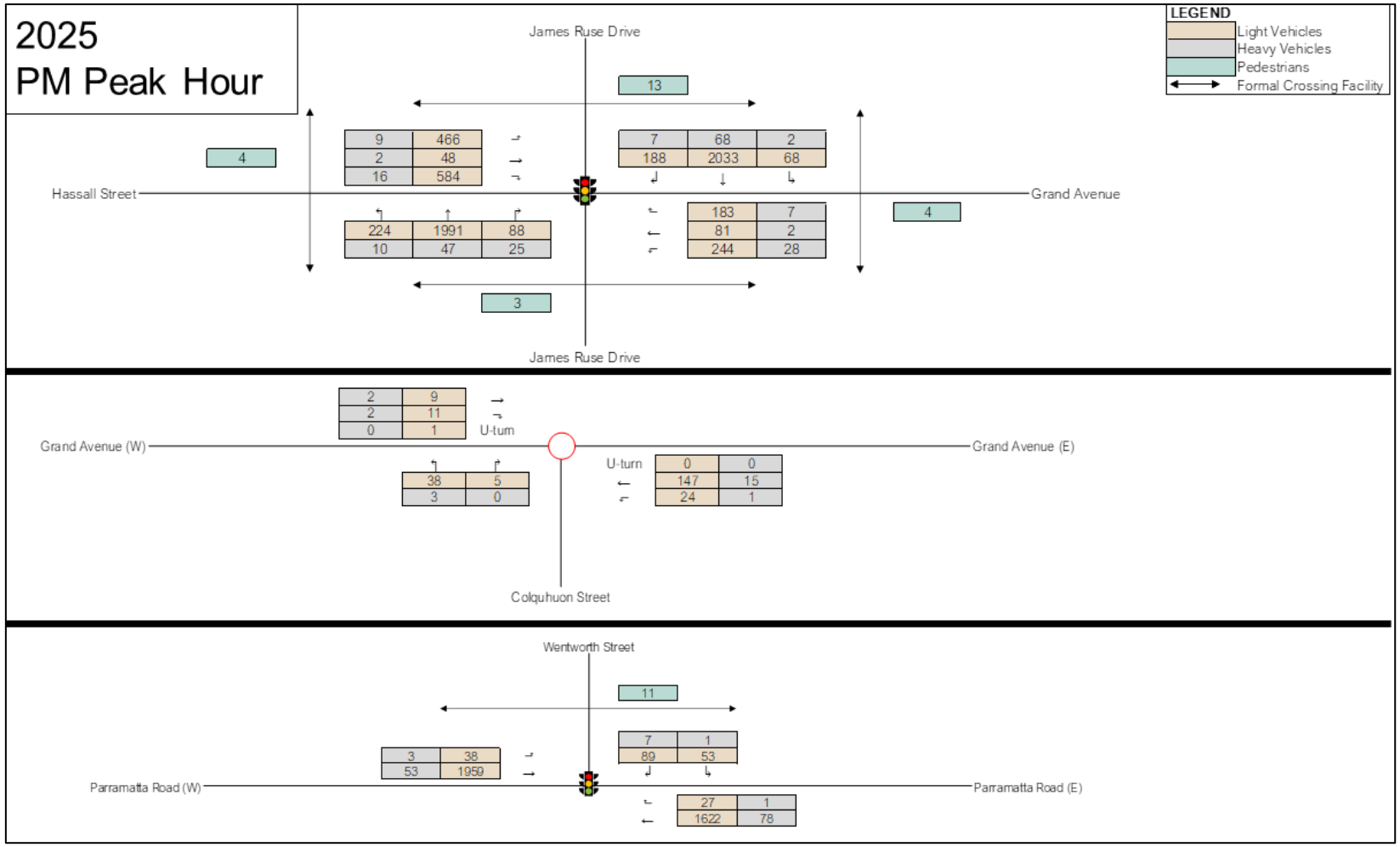


**Figure 3-3: Existing Base Case (2025) - PM Peak Hour Traffic Volumes**



# 4 Strategic Context

## 4.1 Overview

Significant transformation works have commenced within the Camellia – Rosehill area. In order to understand the direction of Camellia – Rosehill and future transport scenarios the following major projects have been considered during preparation of this assessment:

- Camellia-Rosehill Place Strategy
- Parramatta Light Rail Stages 1 and 2
- Sydney Metro West
- Duck River Nature Trail

## 4.2 Camellia-Rosehill Place Strategy (2022)

The Camellia-Rosehill Place Strategy is a key component of the broader urban renewal and infrastructure planning efforts within the GPOP corridor. The Camellia-Rosehill area has historically been characterised by industrial land uses. The Camellia-Rosehill Place Strategy sets the vision for significant urban renewal and the delivery of a mixed-use precinct that would support new housing, employment and public spaces. The strategy plans for a new town centre in Camellia with up to 15,400 jobs and 10,000 new homes supported by infrastructure. The new town centre leverages its strategic location near Parramatta CBD and Sydney Olympic Park, both of which are major nodes in the Sydney Metro West project. The integration of land use and transport planning in this precinct is central to achieving the NSW Government's objectives for GPOP as a leading economic and innovation corridor.

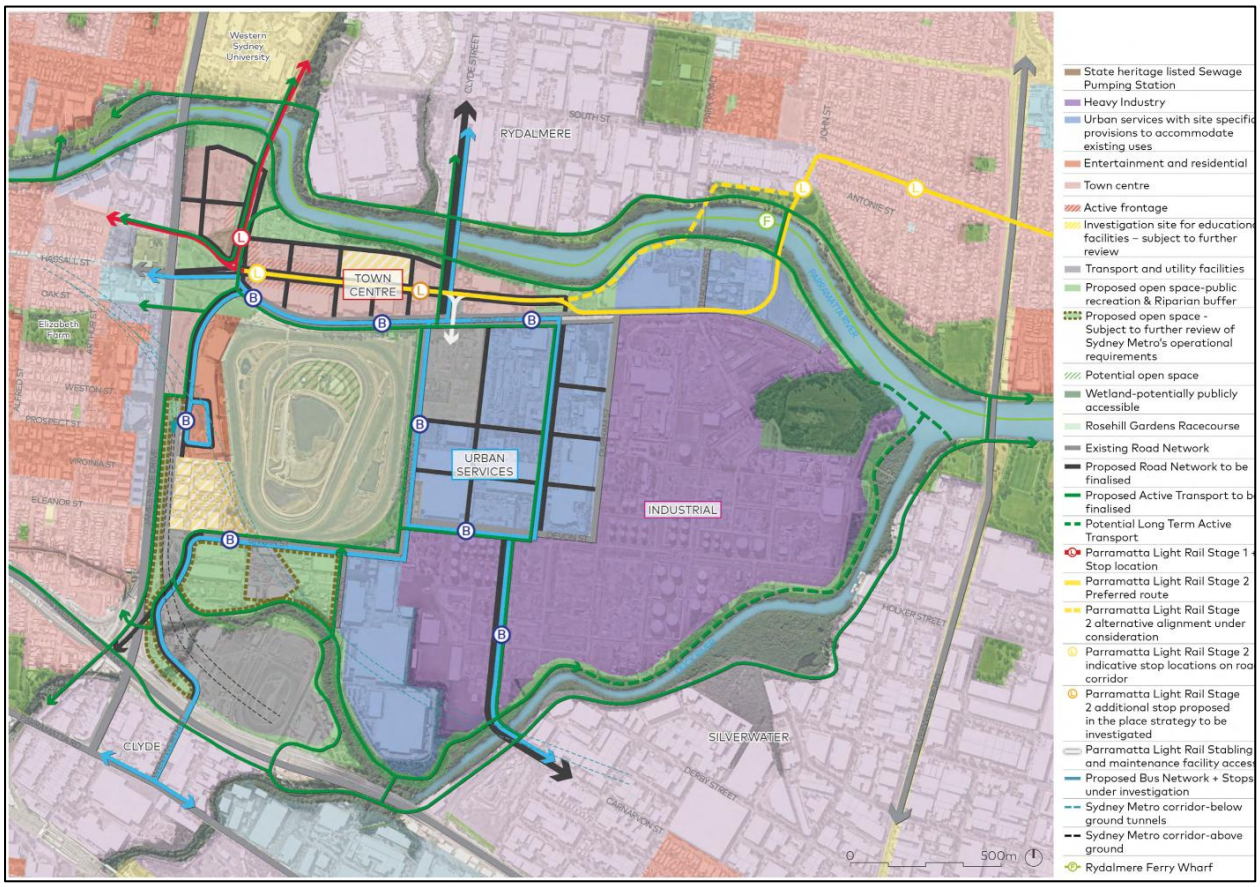
The project would support the Camellia-Rosehill Place Strategy by:

- providing wastewater infrastructure to service the expected growth within the new precinct
- providing the ability to deliver integrated water management by producing advanced treated water for potential future use
- developing a place and design framework to ensure the new WRRF complements the surrounding areas and developing precinct
- including renewable energy generation and beneficial reuse of biosolids to deliver sustainable process and support net-zero targets.

The project aligns with the place-based planning approach being applied in Camellia-Rosehill, where infrastructure delivery is closely coordinated with land use change. This integration ensures that essential services are in place to support new communities and businesses, while also contributing to the resilience and liveability of the precinct.

Figure 4-1 shows the context of the Camellia-Rosehill precinct relative to the current and proposed railway infrastructure within Sydney.

**Figure 4-1: Context Map of Camellia-Rosehill Precinct**




Source: Camellia-Rosehill Place Strategy | Planning Portal - Department of Planning and Environment, accessed August 2025
**Note:** Not to scale

At the time of assessment, Sydney Water understands that as part of future planning for the Camellia-Rosehill precinct the proposed road through the WRRF site would be relocated, potentially to the east of the WRRF facility. It is noted that the WRRF site does not connect directly to Duck River, nor does it share a boundary.

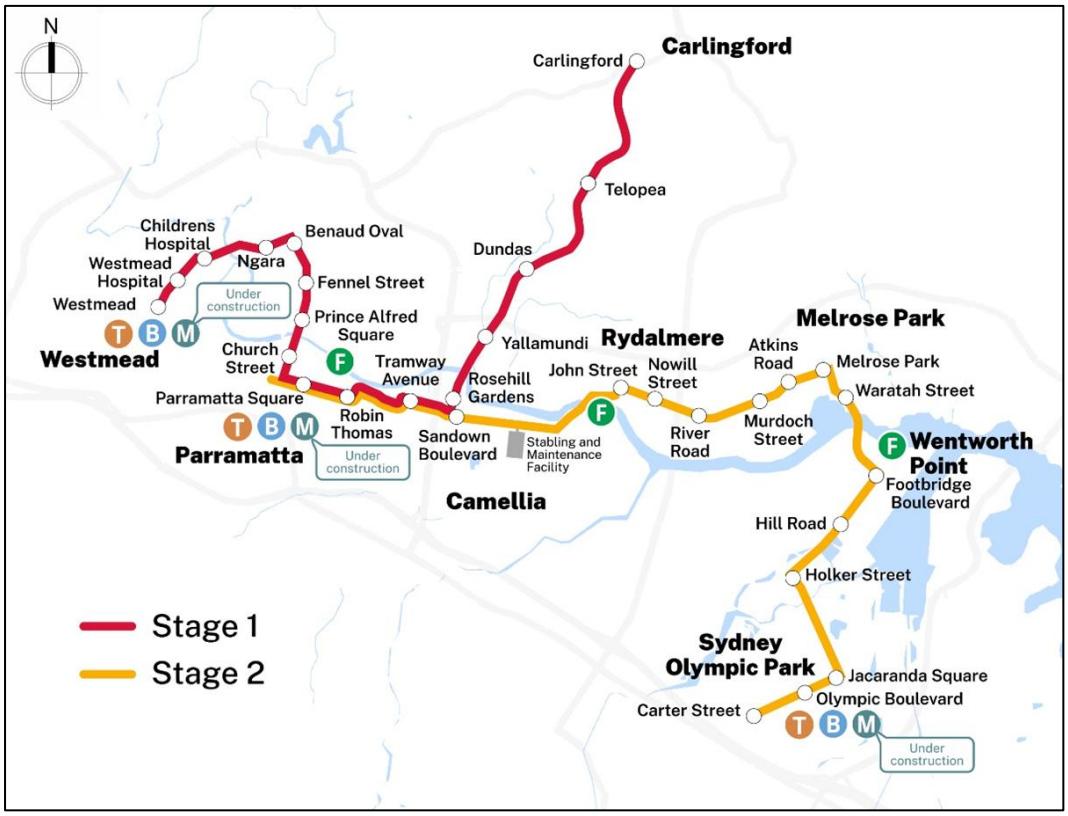
## 4.3 Parramatta Light Rail (PLR)

The NSW Government announced a light rail network in Western Sydney along with the Stage 1 alignment of PLR in early 2017. It covers the key hubs of Westmead, Parramatta and Camellia with extension through to Carlingford on the now closed heavy rail line. It has been designed to integrate with Sydney Metro West, buses, ferries and active transport modes, enhancing connectivity across the Central River City.

PLR Stage 1 became operational at the end of 2024 and by 2026, around 22,000 people are expected to use it every day, with an estimated 130,000 people living within walking distance of the 16 light rail stops.

Planning is currently underway for Stage 2, with the preferred alignment providing further connections to Ermington, Wentworth Point and Carter Street Precinct via Sydney Olympic Park. The Stage 1 and indicative Stage 2 alignment of PLR is shown in Figure 4-2.

**Figure 4-2: Parramatta Light Rail**




Source: Parramatta Light Rail | NSW Government, accessed April 2025
**Note:** Not to scale

PLR Stage 2 would connect local communities in the GPOP area and bring the vision of a '30-minute city' closer to reality.

Stage 2 would have:

- 14 stops over a new 10-kilometre two-way track
- travel times of around 31 minutes from Camellia to the Carter Street Precinct via Sydney Olympic Park, and a further 7 minutes to the Parramatta CBD
- high frequency services on weekdays between 7 am to 7 pm, and around every 10 to 15 minutes outside those times, on weekends and public holidays.

Stage 2 would also connect to the:

- Sydney Metro West (under construction) and heavy rail in the Parramatta and Sydney Olympic Park areas
- ferry services at Rydalmere and Sydney Olympic Park.

Construction of Stage 2 would be delivered in phases, beginning with Enabling Works focused on the first 1.3 kilometres of the new light rail alignment. This includes a new public and active transport bridge over the Parramatta River between Melrose Park and Wentworth Point, scheduled to commence major construction in 2025. These works are located downstream of the GPOP Water Cycle Management project area and may influence regional hydrology and connectivity planning.

The NSW Government has allocated $2.1 billion for the delivery of the remainder of Stage 2, with future phases expected to progress eastward from Camellia, passing through Rydalmere and Ermington, which are directly adjacent to the GPOP precinct. Coordination between light rail construction and water cycle infrastructure would be essential to manage potential interface issues such as stormwater management, creek diversions, and land access.

Of particular note, Stage 2 of the PLR is proposed along Hill Road and Holker Street. Depending on timing, construction of this infrastructure would interact with the project. Sydney Water and PLR are working closely to discuss the infrastructure program with other stakeholders in the area. This traffic assessment considers the cumulative construction impacts of both projects in Section 9.

### 4.3.1 Clyde Stabling and Maintenance Facility

Located in Camellia, adjacent to the GPOP Water Cycle Management project area, the PLRE Clyde Stabling and Maintenance Facility is a critical component of the PLR project. It supports the operation and maintenance of the light rail fleet and includes stabling yards, maintenance workshops, a control centre and staff amenities.

The facility was constructed on remediated industrial land and incorporates sustainable design features such as a 300 kiloWatt solar panel array, rainwater harvesting and recycling systems, and energy-efficient lighting. These features align with the GPOP Water Cycle Management objectives, particularly in relation to integrated water reuse and circular economy principles.

Its proximity to the proposed Water Resource Recovery Facility (WRRF) and associated infrastructure means that coordination is essential to manage potential impacts on local traffic.

## 4.4 Sydney Metro West

The Sydney Metro West project is a major infrastructure initiative designed to enhance connectivity between Greater Parramatta and the Sydney CBD. Construction of Stage 3 of Sydney Metro West (Sydney Metro West - Rail infrastructure, stations, precincts and operations (SSI-22765520)) is expected to commence in late 2025 with peak construction from Q3 2026 to Q4 2027. Sydney Metro is targeting an operational date of 2032.

Notably, from Q1 2028, the construction work would mainly involve rail systems, testing and commissioning which would not generate a lot of vehicle movements. The Sydney Metro West – Rail infrastructure, station, precincts and operations Environmental Impact Statement Technical Paper 2: Construction transport (Sydney Metro 2022) states that during phase 2 (peak construction), there would be up to 28 vehicle movements per hour. These numbers dramatically decline by phase 3 and, since the GPOP project would not be commencing construction until after the peak construction of the Sydney Metro West has been completed, its impacts are expected to be limited.

The project also includes a stabling and maintenance facility at Clyde and services facility at Rosehill, which is located approximately 500 metres west of the WRRF site for the GPOP project. The Sydney Metro West stabling and maintenance facility includes stabling tracks to store trains, a maintenance centre and depot, while supporting other important maintenance services.

The Clyde maintenance and stabling facility would operate 24 hours, seven days a week. New pedestrian access would also be provided to the Rosehill Gardens racecourse from James Ruse Drive

to replace the former Rosehill Station footbridge. The Rosehill services facility includes a facility building, traction substation and operational water treatment plant. This facility would be unmanned.

The indicative Sydney Metro West stations are shown in Figure 4-3.

**Figure 4-3: Projected Sydney Metro West Stations**


Source: Map - interactive portal | Transport for NSW | Community Analytics (caportal.com.au), accessed April 2025

## 4.5 Duck River Nature Trail

The Duck River Nature Trail is a major green infrastructure project that would run through Silverwater and Camellia, south of the WRRF site and near a section of the river release pipeline. It is designed to enhance active transport and public access to the Duck River corridor, with over 4.5 kilometres of shared walking and cycling paths, boardwalks and a new pedestrian bridge.

Construction is being delivered in stages, with Stage 1 underway in Silverwater Park as of 2025. Stage 2, which includes over 3 kilometres of new paths and boardwalks, is scheduled for 2026. Most relevant to this project is Stage 3, planned for 2027 to 2028, which includes a 35-metre pedestrian and cyclist bridge and extensive works along the Camellia foreshore. However, it is noted that the Duck River Nature Trail project is smaller in scale compared to the PLR and Sydney Metro West projects and its impacts are therefore expected to be limited.

# 5 Existing Conditions

## 5.1 Road Network

### 5.1.1 Road Network Classifications

Roads are classified according to the functions they perform. The main purpose of defining a road's functional class is to provide a basis for establishing the policies which guide the management of the road according to their intended service or qualities.

In terms of functional road classification, state roads are strategically important as they form the primary network used for the movement of people and goods between regions and throughout the State. TfNSW is responsible for funding, prioritising and carrying out works on state roads. State roads generally include roads classified as freeways, state highways and main roads under the Roads Act 1993 and the regulation to manage the road system is stated in the Australian Road Rules, most recently amended on 22 November 2019.

TfNSW defines four levels in a typical functional road hierarchy, ranking from high mobility and low accessibility to high accessibility and low mobility. These road classes are:

- **Arterial roads** – controlled by TfNSW, typically no limit in flow and designed to carry vehicles for long distances between regional centres.
- **Sub-arterial roads** – managed by either Council or TfNSW under a joint agreement. Typically, their operating capacity ranges from 10,000 to 20,000 vehicles per day and their aim is to carry through traffic between specific areas in a subregion or provide connectivity from arterial road routes.
- **Collector roads** – provide connectivity between local sites and the sub-arterial road network and typically carry between 2,000 and 10,000 vehicles per day.
- **Local roads** – Provide direct access to properties and the collector road system and typically carry between 500 and 4,000 vehicles per day.

Key roads for the project were previously shown in Figure 2-1. A summary of the relevant roads on the surrounding road network is provided in Table 5.1.

Notably, the assessment has also been carried out with consideration to the hierarchy used in the Camellia-Rosehill Place Strategy Traffic and Transport Implementation Report which is discussed in Section 5.1.2.

**Table 5.1: Surrounding Road Network**

| Road | Classification | Description |
|---|---|---|
| **James Ruse Drive** | Arterial road | Two-way road with three lanes of traffic in each direction. Parking is not permitted on either side of James Ruse Drive. The speed limit is 70 kilometres per hour. |
| **Parramatta Road** | Arterial road | Two-way road with two lanes of traffic in each direction within the vicinity of the proposed project. Parking is not permitted on either side of Paramatta Road. The speed limit is 60 kilometres per hour. |
| **Grand Avenue** | Local road | Two-way road, with one lane of traffic in each direction from east to west and much of this road separated in the middle by a green strip approximately 15-metres-long. Unrestricted parking is allowed along both sides of Grand Avenue. The speed limit is 50 kilometres per hour. |
| **Colquhoun Street** | Local road | Two-way road, with one lane of traffic in each direction from north to south. Unrestricted parking is allowed along both sides of Colquhoun Street. The speed limit is 50 kilometres per hour. |
| **Unwin Street (WRRF site access)** | Local road | Two-way road, with one lane of traffic in each direction. Unrestricted parking is allowed along both sides of Unwin Street. The speed limit is 50 kilometres per hour. |
| **Devon Street (WRRF site access)** | Local road | Two-way road, with one lane of traffic in each direction from east to west. Unrestricted parking is allowed along both sides of Devon Street. The speed limit is 50 kilometres per hour. |
| **Wentworth Street** | Local road | Two-way road, with one lane of traffic in each direction from north to south. Unrestricted parking is allowed along both sides of Wentworth Street. The speed limit is 50 kilometres per hour. |
| **Silverwater Road** | Arterial road | Two-way road with three lanes of traffic in each direction. Parking is not permitted on either side of Silverwater Road. The speed limit is 70 kilometres per hour. |
| **Hill Road** | Sub-arterial road | Two-way road with two lanes of traffic in each direction from north to south. Parking is not permitted on either side of Hill Road. The speed limit is 60 kilometres per hour. |
| **Kissing Point Road** | Arterial road | Two-way road with three lanes of traffic in each direction from east to west. Parking is not permitted on either side of Kissing Point Road. The speed limit is 60 kilometres per hour. |
| **Victoria Road** | Arterial road | Two-way road with two lanes of traffic in each direction from east to west. Parking is not permitted on either side of Victoria Road. The speed limit is 60 kilometres per hour. |
| **Carnarvon Street** | Local road | Two-way road with one lane of traffic in each direction from east to west. Unrestricted parking is allowed along both sides of Carnarvon Street. The speed limit is 50 kilometres per hour. |
| **Vore Street** | Local road | Two-way road with one lane of traffic in each direction from north to south. Unrestricted parking is allowed along both sides of Vore Street. The speed limit is 50 kilometres per hour. |
| **Derby Street** | Local road | Two-way road with one lane of traffic in each direction from east to west. Unrestricted parking is allowed along both sides of Derby Street. The speed limit is 50 kilometres per hour. |
| **Day Street North** | Local road | Two-way road with one lane of traffic in each direction from north to south. Unrestricted parking is allowed along both sides of Day Street North. The speed limit is 50 kilometres per hour. |
| **Fariola Street** | Local road | Two-way road with one lane of traffic in each direction from east to west. Unrestricted parking is allowed along both sides of Fariola Street. The speed limit is 50 kilometres per hour. |
| **Comaneci Avenue** | Local road | Two-way road with one travel lane from east to west. Unrestricted parking is allowed along both sides of Comaneci Avenue. The speed limit is 40 kilometres per hour. |
| **Newington Boulevard** | Local road | Two-way road with one lane of traffic in each direction from north to south which is separated by a median nature strip. Unrestricted parking is allowed along both sides of Newington Boulevard. The speed limit is 50 kilometres per hour. |
| **Holker Street** | Sub-arterial road | Two-way road with two lanes of traffic in each direction from east to west. Parking is not permitted on either side of Holker Street. The speed limit is 60 kilometres per hour. |
| **Meadow Crescent** | Local road | Two-way road with one lane of traffic in each direction from east to west. Unrestricted parking is allowed along both sides of Meadow Crescent, with some spaces on the southern side provided as perpendicular parking spaces. The speed limit is 50 kilometres per hour. |
| **Railway Street** | Local road | Two-way road with one lane of traffic in each direction from north to south. Parking is not permitted on either side of Railway Street. The speed limit is 50 kilometres per hour. |

| Road | Classification | Description |
|---|---|---|
| **Rippon Avenue** | Local road | Two-way road with one travel lane from north to south. Unrestricted parking is allowed along both sides of Rippon Avenue. The speed limit is 50 kilometres per hour. |
| **Avenue of Oceania** | Local road | Two-way road with one travel lane. Includes a parking lane on each side, separated by a median. Unrestricted parking is allowed along both sides of Avenue of Oceania. The speed limit is 50 kilometres per hour. |
| **Anderson Avenue** | Local road | Two-way road with one lane of traffic in each direction from east to west and north to south. Unrestricted parking is allowed along both sides of Anderson Avenue. The speed limit is 50 kilometres per hour. |

### 5.1.2 Movement and Place

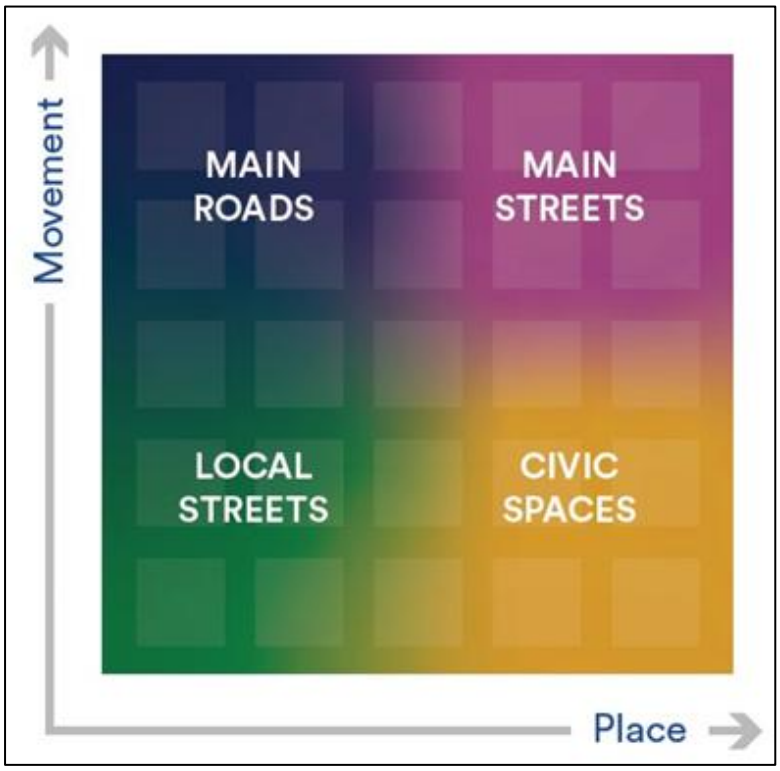
The Camellia-Rosehill Place Strategy - Traffic and Transport Implementation Report (2022) includes a categorisation of the existing road network in the Camellia-Rosehill precinct in line with the criteria in the Movement and Place Practitioners Guide (Government Architect NSW, 2020).

The Roads Act 1993 sets out the legal classification of roads, their ownership and responsibility for maintenance. The Movement and Place Practitioners Guide (Government Architect NSW, 2020) provides a framework to identify street types and environments based on their movement function and level of place intensity. Both documents have been referenced when identifying the classification of respective roads.

Furthermore, depending on the movement activity and place value of a transport network element, corridors and links are classified as main roads (with higher movement functions), civic spaces (with higher place functions), main streets (activated road and transport links) and local streets (connection to land uses). The key to this road classification is shown in Figure 5-1.

The current environment in Camellia-Rosehill has a low level of place with an absence of a civic street. Most street environments within the Camellia-Rosehill Place Strategy are mainly classified as local streets which experience consistent volumes of industrial traffic throughout the day. James Ruse Drive is a primary main road which connects traffic travelling from the M4 motorway and Parramatta Road to the precinct.

**Figure 5-1: Camellia-Rosehill Place Strategy – Street Environments**




Source: Camellia-Rosehill Place Strategy - Traffic and Transport Implementation Report (2022)

### 5.1.3 School Zones

Designated school zones are concentrated in residential and mixed-use areas, where reduced speed limits (typically 40 km/h during school hours) apply to enhance pedestrian safety. These zones are critical for managing traffic and construction staging.

Notably, the study area is predominantly industrial and commercial with minimal school zone presence.

Notwithstanding, the brine pipeline relining works are located within a residential area but do not have any applicable school zone restrictions.

Furthermore, the river release pipeline would travel within 200 metres of Wentworth Point Public School and Wentworth Point High School. School zones for both schools are located on Hill Road and Burroway Road in Wentworth Point. No construction compounds are proposed in or near the school zone. Construction in this area would only involve below ground HDD for the river release pipeline and no surface works are anticipated. No construction traffic for the project would travel through this school zone. No school zone restrictions have been identified for the brine pipeline.

### 5.1.4 Nearby Land Use

The study area is predominantly industrial and commercial. However, there are different nearby land uses that are within the vicinity of the brine, transfer and river release pipelines.

The brine pipeline relining works are located near residential land and the Western Sydney University – Parramatta Campus (WSU – PC) which contributes to a lot of pedestrian activity. The brine pipeline is

also located in close proximity (30 to 70 metres) to several light rail stops at Rosehill Gardens Racecourse, WSU – PC, and Dundas.

The brine and transfer pipelines between Camellia pumping station and the WRRF includes commercial land uses around the pumping station and Rosehill Gardens Racecourse, a recreational land use. The remainder of the area is industrial and commercial.

Surrounding land uses vary along the alignment of the river release pipeline at Silverwater. On the western area of Carnarvon Street, land uses are predominantly commercial and industrial. The western area of Carnarvon Street, between Stubbs Street and Silverwater Road includes residential land to the south, and commercial and industrial land to the north.

The next section of the river release pipeline construction works that occur at Comaneci Avenue, Newington Boulevard, Holker Busway, Hill Road and Meadow Crescent have nearby land uses such as medium to low density residential, recreational facilities at Sydney Olympic Park (including URBNSURF) and communal facilities (such as parks). Sydney Olympic Park is a major events precinct that experiences high levels of traffic outside of the typical peak travel periods. URBNSURF is a major recreational facility that has fluctuating traffic volumes based on events that happen in the Sydney Olympic Park area.

The final section of the river release pipeline within Meadowbank and Memorial Parks is a recreational land use. These areas are used extensively for pedestrian, cycling and other active transport modes.

### 5.1.5 Heavy Vehicle Routes - TfNSW National Heavy Vehicle Regulator (NHVR)

Oversize and/ or Overmass (OSOM) vehicles may be required at the start and end of the construction period to bring in earth moving equipment (such as excavators, dozers, etc), which would be done in accordance with TfNSW requirements. These vehicles are expected to remain on site within the compounds over the construction phase.

The NSW OSOM Load Carrying Vehicles Network map displays the network for eligible vehicles operating under the following Heavy Vehicle National Law notices:

- Multi-State Class 1 Load Carrying Vehicles Dimension Exemption Notice 2020, which authorises the use of class 1 load carrying vehicles that are up to 5.5 m wide, 35 m long and 5 m high
- Multi-State Class 1 Load Carrying Vehicles Mass Exemption Notice 2020, which authorises the use of class 1 load carrying vehicles that are up to 115 tonnes.

The roads identified as OSOM (or B-double) routes within the study area are listed in Table 5.2 and shown in Figure 5-2.

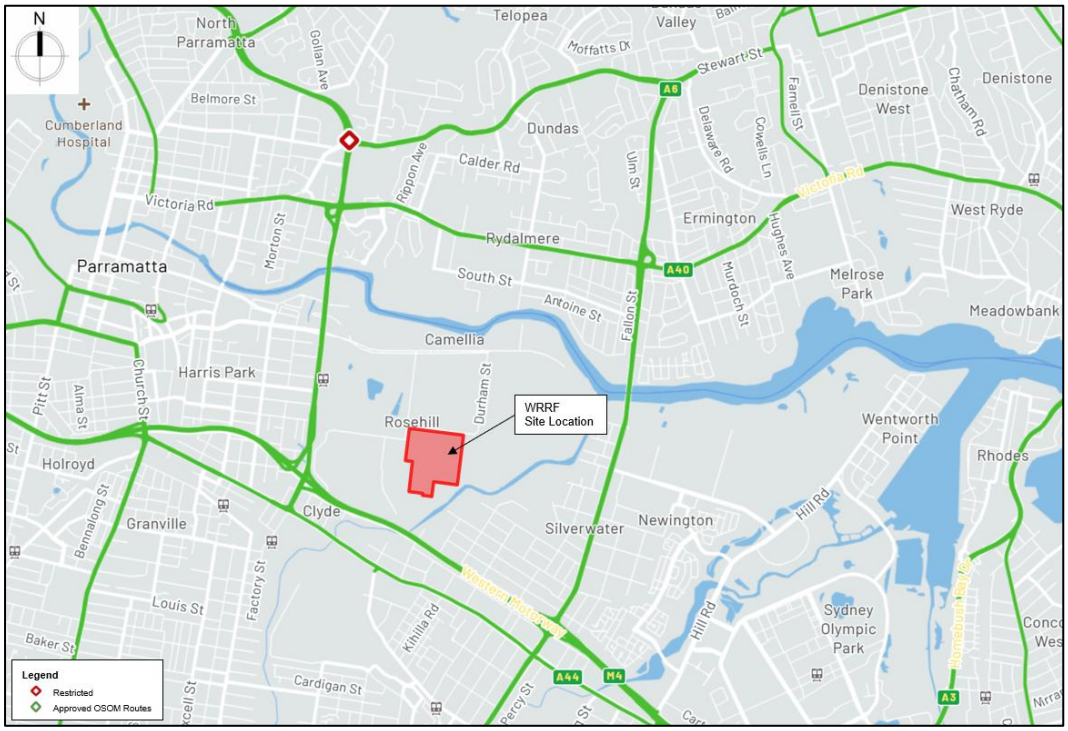
The need for OSOM movements has not yet been confirmed. An OSOM permit issued by the National Heavy Vehicle Regulator would be required if deliveries involve OSOM vehicles that do not comply with the prescribed mass or dimension limits under the Heavy Vehicle (Mass, Dimension and Loading) National Regulation 2013 or any applicable State notice under the Heavy Vehicle National Law (NSW).

**Table 5.2: Heavy Vehicle Routes within the Surrounding Road Network**

| Location | Road Sections of Approved Heavy Vehicle Routes |
|---|---|
| Camellia | • Grand Avenue, between Hassall Street/ James Ruse Drive and private property access (east of Thackeray Street)<br>• Thackeray Street, between Grand Avenue and bridge over Parramatta River<br>• James Ruse Drive<br>• Colquhoun Street<br>• Durham Street<br>• Devon Street<br>• Unwin Street |
| Wentworth Point | • Hill Road, between Burroway Road and Bennelong Parkway<br>• Burroway Road, east of Hill Road |
| Rydalmere and Ermington | • Silverwater Road<br>• Victoria Road<br>• Clyde Street, between Victoria Road and South Street |
| Sydney Olympic Park | • Hill Road, south of Bennelong Parkway<br>• Holker Street, west of Hill Road |

Source: National Network Map | NHVR, accessed July 2025

**Figure 5-2: OSOM Network Routes surrounding the WRRF**




Source: National Network Map | NHVR, accessed July 2025
**Note:** Not to scale

## 5.2 Existing Intersection Operation

The operation of the key intersections within the study area has been assessed using SIDRA INTERSECTION[1], a traffic modelling software package which calculates intersection performance.

SIDRA INTERSECTION determines the intersection performance through four key measurements:

- DoS[2]
- Average delay
- 95$^{th}$ percentile queues
- LoS.

TfNSW determines the LoS of an intersection as a function of average delay. SIDRA INTERSECTION determines the average delay that vehicles encounter at the intersection and provides a measure of the LoS.

Table 5.3 shows the criteria that SIDRA INTERSECTION adopts in assessing the LoS.

**Table 5.3: SIDRA INTERSECTION Level of Service Criteria**

| LoS | Average Delay per vehicle (secs/veh) | Traffic Signals, Roundabout | Give Way & Stop Sign |
|---|---|---|---|
| A | Less than 14 | Good operation | Good operation |
| B | 15 to 28 | Good with acceptable delays and spare capacity | Acceptable delays and spare capacity |
| C | 29 to 42 | Satisfactory | Satisfactory, but crash study required |
| D | 43 to 56 | Near capacity | Near capacity, crash study required |
| E | 57 to 70 | At capacity, at signals incidents would cause excessive delays | At capacity, requires other control mode |
| F | Greater than 70 | Extra capacity required | Extreme delay, major treatment required |

For a priority-controlled intersection or roundabout, the LoS is reported based on the worst performing movement. For a signalised intersection, the LoS is reported based on the overall intersection performance. Like all other models, there are limitations to SIDRA INTERSECTION such as conditions that cannot be accurately modelled in the software or impacts that may not be reflected in the results.

Table 5.4 presents a summary of the existing operation of the key intersections, with full results presented in **Appendix A** of this report.

[1] Program used under license from Akcelik & Associates Pty Ltd.
[2] The DOS is the measure of demand relative to the total capacity of the intersection, i.e. a DOS of 1 (or 100%) means that the intersection has reached capacity.

**Table 5.4: Existing Operating Conditions**

| Intersection | Peak | Average Delay (Sec) | LoS | DoS | 95th Percentile Queue (m) |
|---|---|---|---|---|---|
| **James Ruse Drive/ Grand Avenue** | AM | 68 | E | 0.945 | 496 |
| | PM | 123 | F | 1.067 | 624 |
| **Grand Avenue/ Colquhoun Street** | AM | 11 | A | 0.256 | 15 |
| | PM | 9 | A | 0.157 | 6 |
| **Wentworth Street/ Paramatta Road** | AM | 124 | F | 1.210 | 1121 |
| | PM | 94 | F | 1.131 | 910 |

Based on the above assessment, the Grand Avenue/ Colquhoun Street performs well with minimal queuing, delays and a low DoS (with a maximum of 0.256). The James Ruse Drive/ Grand Avenue intersection operates near capacity with a maximum DoS of 1.067, maximum average delay of 123 seconds and a LoS F during the PM Peak. In the AM Peak, it operates near capacity. The Wentworth Street/ Parramatta Road intersection operates poorly with high average delays (maximum of 124 seconds), a maximum DoS of 1.210 and a LoS F during both the AM and PM Peaks.

Site observations confirmed the 2025 base case SIDRA INTERSECTION modelling results, with extensive queuing and long average delays observed at the James Ruse Drive/ Grand Avenue and Wentworth Street/ Parramatta Road intersections.

## 5.3 On-street Car Parking Considerations

A site visit was undertaken on 8 May 2025 between 9:00 am and 6:00 pm during both the peak and off-peak periods to observe the on-street car parking opportunities near the project areas associated with the WRRF, brine and transfer pipelines and the river release pipeline. The results of these observations are shown in Table 5.5.

**Table 5.5: On-street Parking Opportunities for the Project**

| Road | Parking Opportunities | Site Visit Observations |
|---|---|---|
| **WRRF** | | |
| Grand Avenue | On-street parking opportunities are provided on both sides | Most on-street parking opportunities were utilised during the AM/ PM peak periods. |
| Colquhoun Street | On-street parking opportunities are provided on both sides | Most on-street parking opportunities were utilised during the AM/ PM peak periods. |
| Devon Street | On-street parking opportunities are provided on both sides | Few on-street parking opportunities were utilised. On-street parking opportunities are available during the AM/ PM peak periods. |
| Unwin Street | On-street parking opportunities are provided on both sides | Few on-street parking opportunities were utilised. On-street parking opportunities are available during the AM/ PM peak periods. |
| **Brine pipeline (relining section)** | | |
| Railway Street (near the WSU – PC) | No on-street parking opportunities are available. | Not applicable |
| Victoria Road Service Road | On-street parking opportunities are provided on both sides | Most on-street parking opportunities were utilised during the AM/ PM peak periods. |
| Anderson Avenue | On-street parking opportunities are provided on both sides | Few on-street parking opportunities were utilised. On-street parking opportunities are available during the AM/ PM peak periods. |
| Rippon Avenue | On-street parking opportunities are provided on both sides | Few on-street parking opportunities were utilised. On-street parking opportunities are available during the AM/ PM peak periods. |
| Grand Avenue North | Some on-street parking opportunities are observed on both sides. | Few on-street parking opportunities were utilised. On-street parking opportunities are available during the AM/ PM peak periods. |
| **River release pipeline** | | |
| Carnarvon Street | On-street parking opportunities on both sides | Most on-street parking opportunities were utilised during the AM/ PM peak periods. |
| Vore Street | On-street parking opportunities on both sides | Most on-street parking opportunities were utilised during the AM/ PM peak periods. |
| Derby Street | On-street parking opportunities on both sides | Most on-street parking opportunities were utilised during the AM/ PM peak periods. |
| Day Street North | On-street parking opportunities on both sides | Most on-street parking opportunities were utilised during the AM/ PM peak periods. |
| Fariola Street | On-street parking opportunities on both sides | Most on-street parking opportunities were utilised during the AM/ PM peak periods. |
| Comaneci Avenue | On-street parking opportunities on alternate sides | Most on-street parking opportunities were utilised during the AM/ PM peak periods. |
| Newington Boulevard | On-street parking opportunities on both sides (separated by a median) | Most on-street parking opportunities were utilised during the AM/ PM peak periods. |
| Hill Road | No on-street parking opportunities | Not applicable |
| Meadow Crescent | On-street parking opportunities on both sides | Most on-street parking opportunities were utilised during the AM/ PM peak periods. |

On-site parking during both the construction and operational phases is expected to be provided for the project workforce and construction/ heavy vehicles at the WRRF. On-site parking requirements are explored further within Section 8.2.2.

For the construction works at the Camellia pumping station, on-street parking using adjacent local roads is expected to be utilised for the project workforce and construction vehicles. This is explored further within Section 7.2.2.

# 5.4 Public Transport

## 5.4.1 Bus and Light Rail

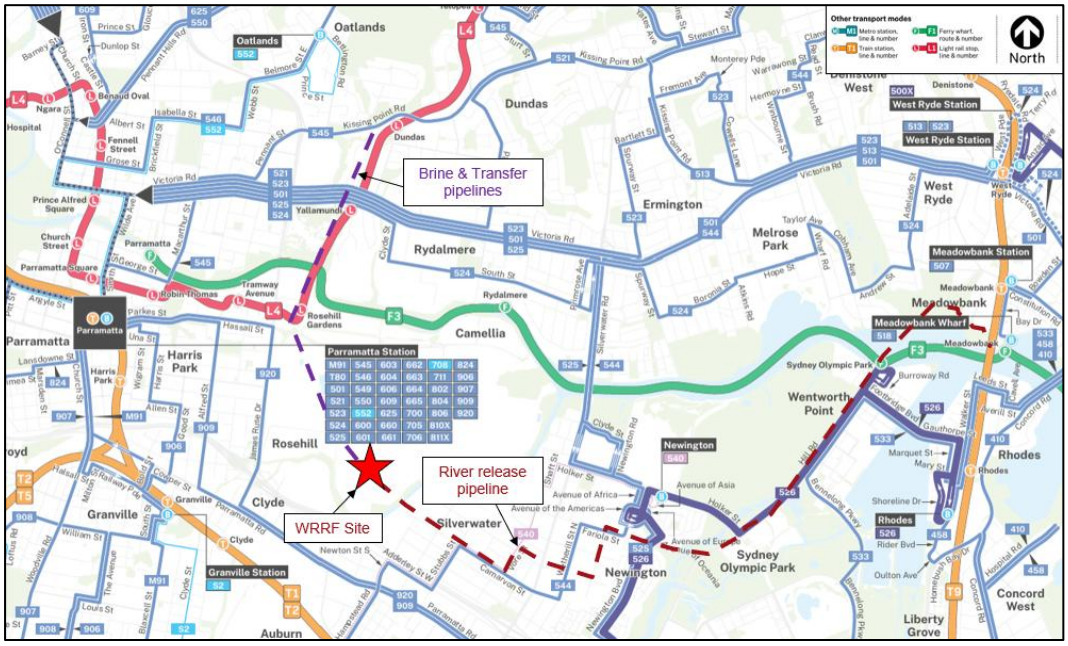
A review of the bus and light rail provision in the vicinity of the study area is summarised in Table 5.6 and the location of the proposed WRRF site and the respective transfer pipeline, brine pipeline and river release pipeline relative to the public transport network is shown in Figure 5-3. A review of the bus stops and their impacts is explored directly within Section 7.

**Table 5.6: Public Transport Provision**

| Service | Route # | Route description | Location of stop | Peak Frequency |
|---|---|---|---|---|
| **Bus** | 500N, 501, 521, 523, 524, 525, N61, N81 | Parramatta | Victoria Road | 15 to 30 mins |
| **Bus** | 545 | North Ryde | Kissing Point Road | 30 mins both |
| **Bus** | 540, 544 | Eastwood Station, Macquarie Centre | Carnarvon Street, Vore Street | 30 to 60 mins |
| **Bus** | 525, 526 | Parramatta, Rhodes Shopping Centre | Newington Boulevard | 15 to 30 mins |
| **Bus** | 533 | Chatswood | Holker Busway | 15 to 30 mins |
| **Light rail** | L4 | Westmead and Carlingford Line | Rosehill Gardens, Yallamundi, Dundas | 9 to 12 mins |

Source: TfNSW, GSBC4 Network map, effective 3 March 2025, accessed April 2025

**Figure 5-3: Public Transport Network Map**




Source: TfNSW, GSBC4 Network map, effective 3 March 2025, accessed April 2025
**Note:** Not to scale

### 5.4.2 Train

The GPOP area is serviced by multiple rail services which vary in frequency. Parramatta Station is a significant transport hub that supports rail services for the GPOP area, Greater Sydney and Regional NSW. The T1 western line is a highly utilised facility that supports frequent rail services between Parramatta Station and Central Station in the Sydney CBD. Dundas, Rydalmere, Camellia, Rosehill, Silverwater and Wentworth Point are currently not serviced by train services. The former T6 Carlingford line was converted to the L4 Light Rail line (also referred to as Stage 1 of Parramatta Light Rail) and opened for services in 2024. The light rail connects passengers between these areas to train services at Parramatta and Westmead stations.

Sydney Olympic Park is currently serviced by a single rail service that runs between Sydney Olympic Park and Lidcombe Station. Passengers travelling on this line can interchange at Lidcombe to access the broader rail network.

The T9 Northern Line services the Ryde area and includes a station at Meadowbank. Services at Meadowbank travel south along the City Circle, and also travel north to the North Shore, Central Coast and Newcastle. Passengers can interchange with Metro services at Epping.

### 5.4.3 Ferry

The section of the Parramatta River in the study area is used by a range of commercial and recreational users, including:

- Parramatta River ferry
- recreational power boating and fishing
- non-powered boating activities, including sailing, rowing, dragon boating and kayaking
- commercial vessels (e.g., fuel, spoil and crane barges) used for marine salvage and maintenance works to river structures.

The following wharves and boat ramps are located within the study area:

- Meadowbank Wharf (used by the Parramatta River ferry) – located on the northern bank of the Parramatta River near the John Whitton Bridge, between Rhodes and Meadowbank, accessed via Bowden Street in Meadowbank
- Sydney Olympic Park Wharf (used by the Parramatta River ferry) – located on the southern bank of the Parramatta River between Melrose Park and Wentworth Point, accessed via Hill Road in Wentworth Point
- private wharves owned by Viva Energy Australia and Lubrizol International Incorporated – located on the southern bank of the Parramatta River in Rosehill, to the west of Duck River.

The Parramatta River ferry operates between Parramatta and Circular Quay, with ferry wharves located adjacent to the project's river release pipeline at Wentworth Point (Sydney Olympic Park Wharf) and Meadowbank (Meadowbank Wharf) respectively. Ferry services generally operate every 15 minutes in each direction between the hours of 8 am and 5 pm weekdays and on weekends. Moreover, the

Meadowbank Ferry Wharf provides access to ferries that operate at a frequency of approximately 15 to 30 minutes in both the westbound and eastbound directions.

## 5.5 Active Transport Infrastructure

Active transport refers to walking and cycling. Active transport networks are an essential part of the road network, enhancing accessibility and liveability, and promoting sustainable and environmentally friendly travel.

The WRRF site is proposed within an industrial area with limited walking and cycling facilities, which creates a challenging and potentially unsafe environment for pedestrians and cyclists, discouraging active transportation and limiting connectivity to surrounding areas. Further details are provided in Section 5.5.1.

Notwithstanding, the Camellia-Rosehill Place Strategy (DPE, 2022) aspires to improve the active transport network in the precinct by providing active transport links near the proposed site. Furthermore, the Duck River Nature Trail would run through Silverwater and Camellia, south of the WRRF site and near a section of the river release pipeline. It is also designed to enhance active transport and public access to the Duck River corridor, with over 4.5 kilometres of shared walking and cycling paths, boardwalks and a new pedestrian bridge.

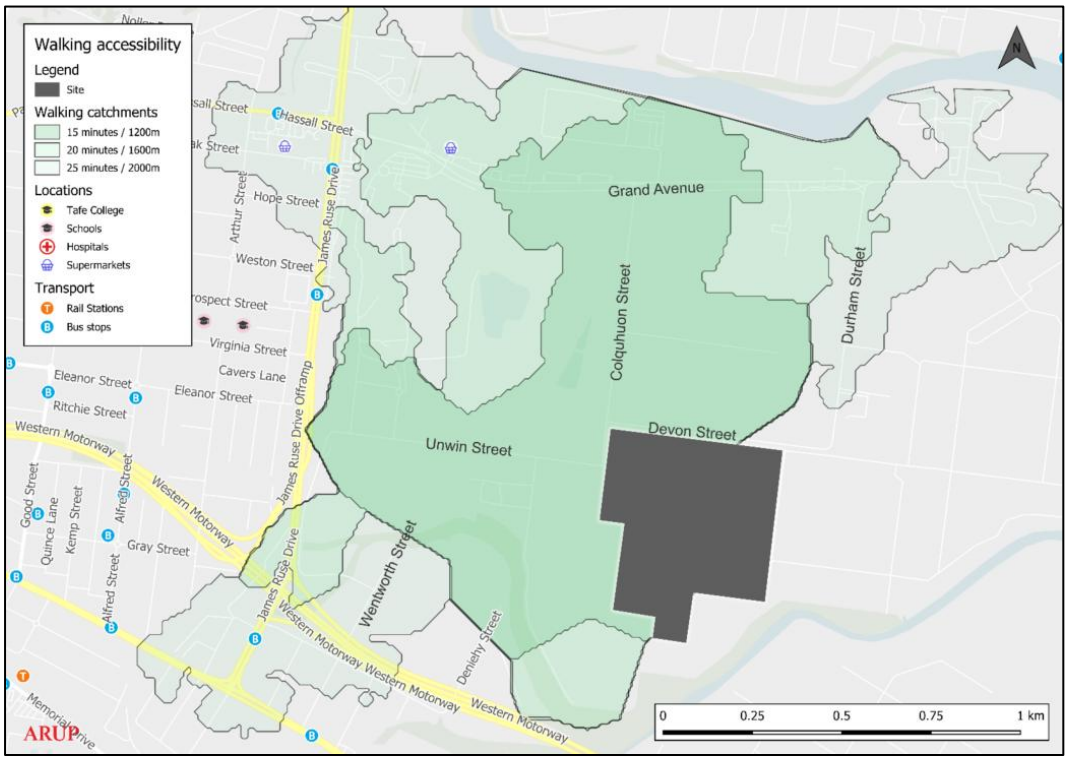
The existing active transport infrastructure in proximity to the three project pipelines is outlined in Sections 7.2 to 7.3.

### 5.5.1 WRRF

There is limited pedestrian amenity in the vicinity of the site. Footpaths are only provided sporadically along Grand Avenue (northern side, between James Ruse Drive and Colquhoun Street) and on Unwin Street (southern side, between Shirley Street and Colquhoun Street). An overview of the walking catchment is shown in Figure 5-4.

The walking catchment indicates public/ active transport amenities near the site that workers can utilise.

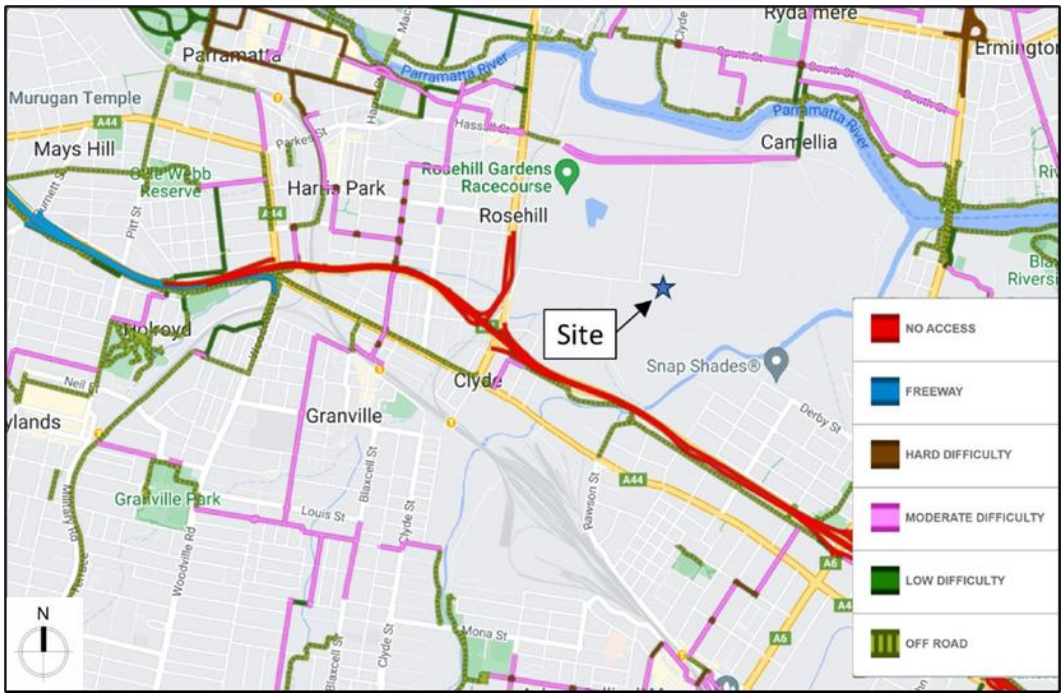
**Figure 5-4: Walking Catchment around the WRRF**




Source: Appendix G Traffic and Transport Impact Assessment by Arup dated 18 September 2024
**Note:** Not to scale

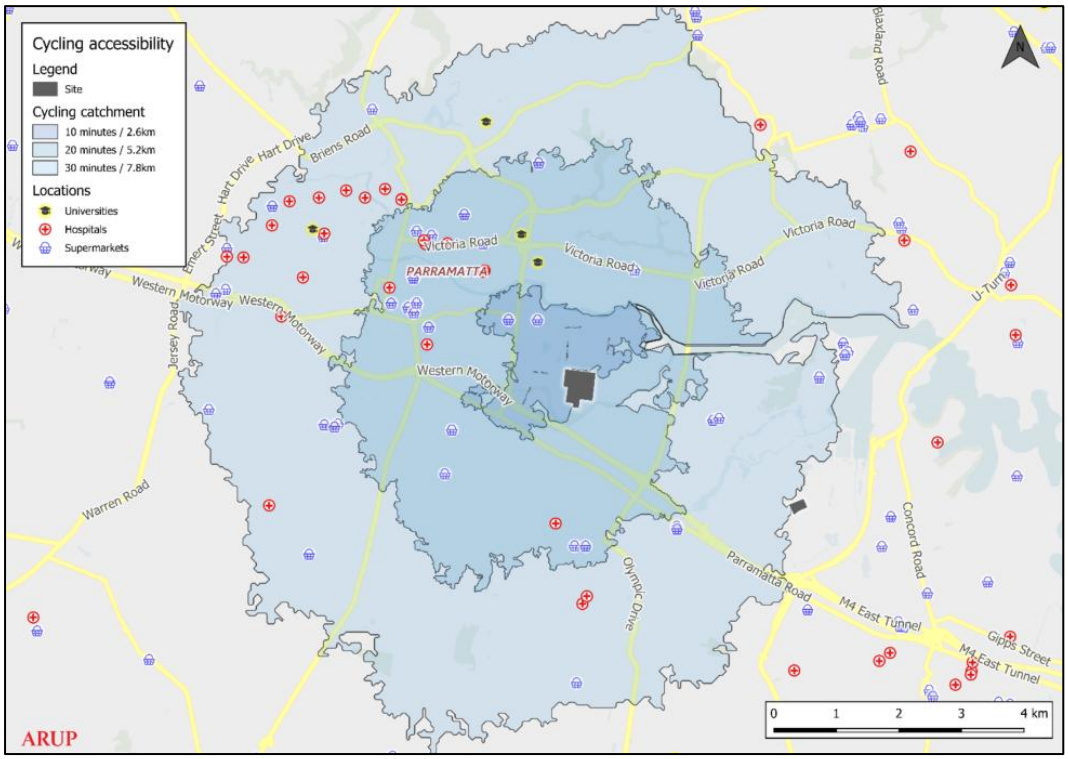
Currently, there are limited cycling facilities and routes provided within the vicinity of the site as illustrated in Figure 5-5. The cycling catchment is illustrated in Figure 5-6.

**Figure 5-5: Cycling Network around the WRRF**




Source: TfNSW, 2024
**Note:** Not to scale

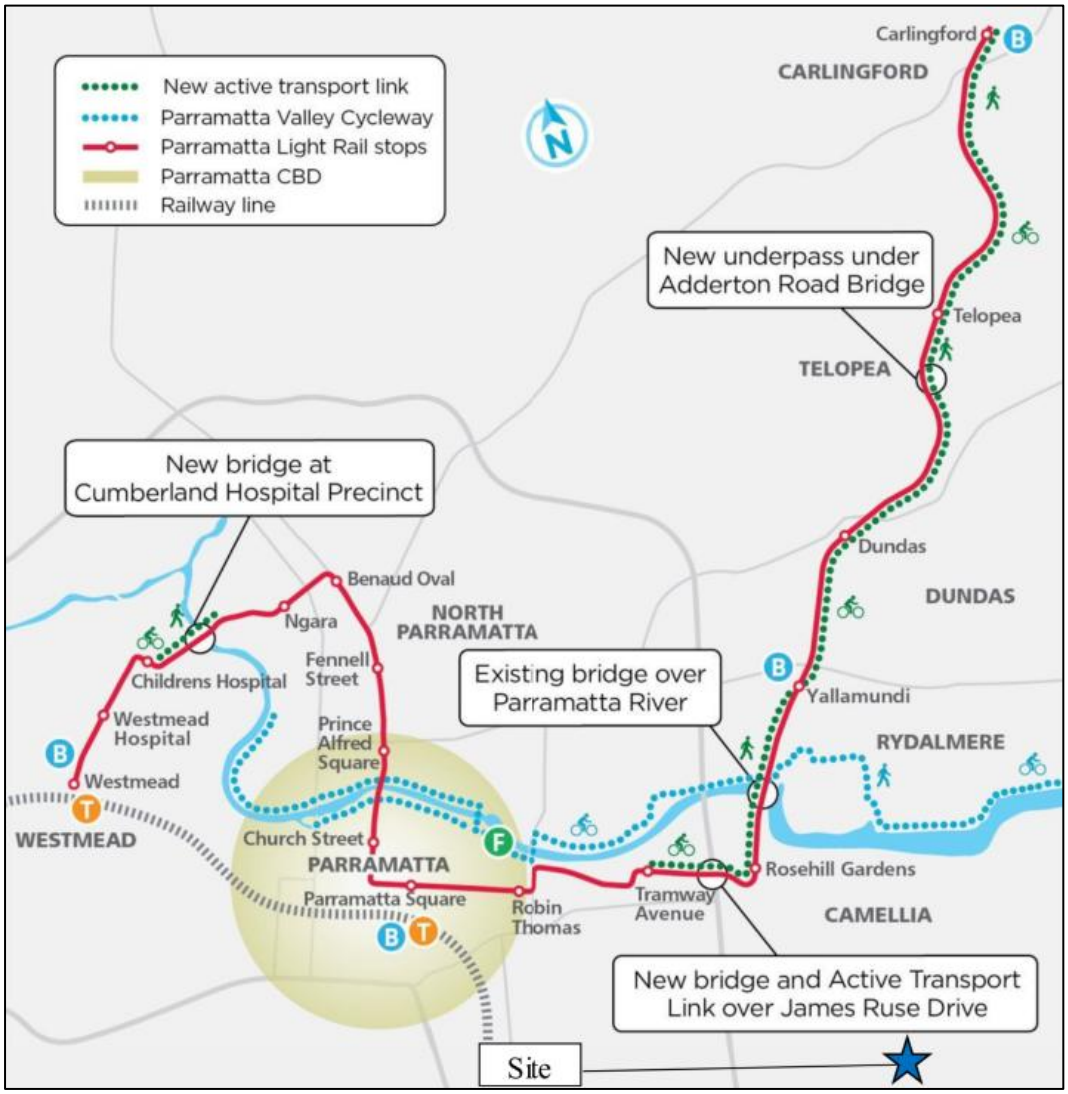
**Figure 5-6: Cycling Catchment around the WRRF**




Source: Appendix G Traffic and Transport Impact Assessment by Arup dated 18 September 2024
**Note:** Not to scale

As part of Stage 1 of Parramatta Light Rail, a new north-south active transport link was delivered. This link extends from Carlingford and travels along the light rail alignment through Telopea, Dundas, Rydalmere and Rosehill. This route then connects to Parramatta via a new bridge over James Ruse Drive. This route is shown in Figure 5-7.

**Figure 5-7: PLR Active Transport Link Map**



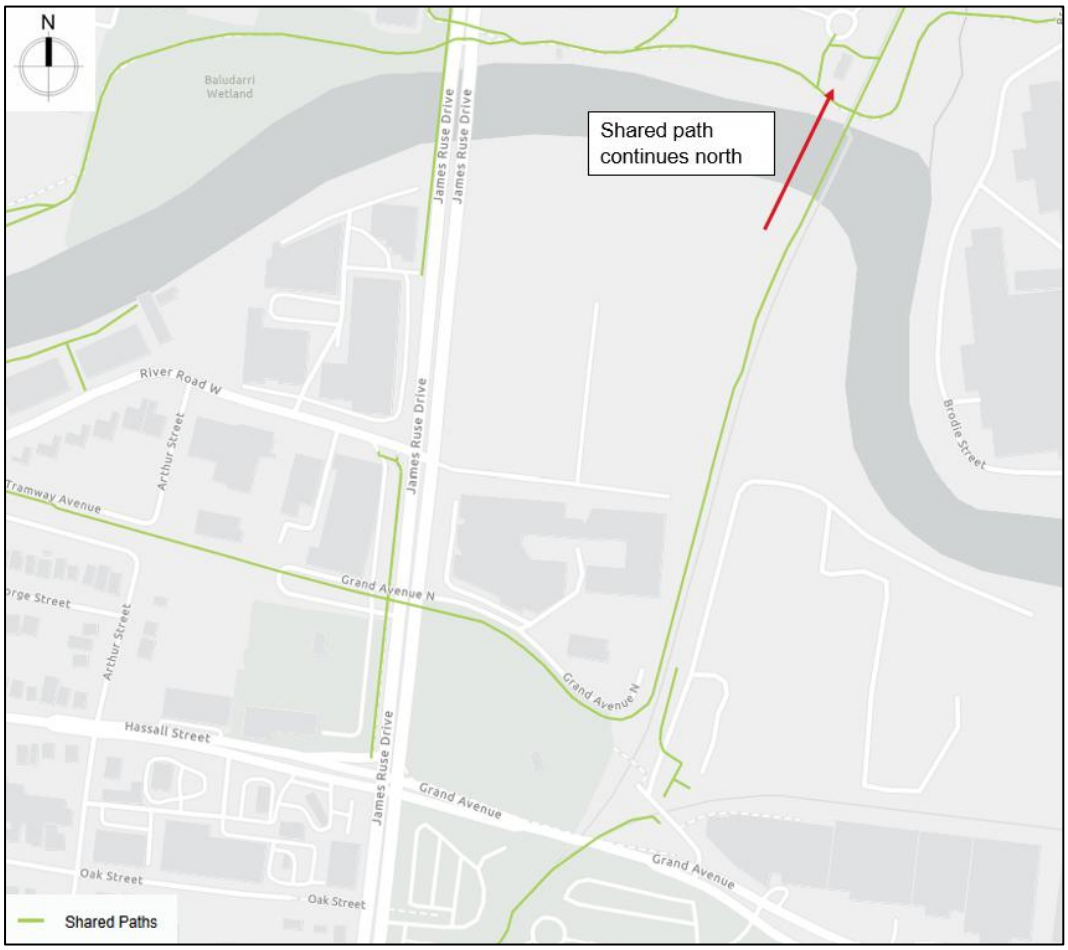

Source: TfNSW, 2024
**Note:** Not to scale

## 5.5.2 Transfer Pipeline

There are shared bicycle paths on the southern side of Grand Avenue which continue north on the Camellia Light Rail Bridge towards the direction of the indicative brine pipeline, as shown in Figure 5-8.

Further impacts to active transport infrastructure at this pipeline are discussed in Table 7.3.

**Figure 5-8: Shared Paths near and surrounding Grand Avenue**




Base image source: Cycleway Finder I TfNSW, accessed July 2025
**Note:** Not to scale

## 5.5.3 Brine Pipeline

The same shared path on the brine pipeline also runs along the eastern part of Railway Street until it reaches Victoria Road. There is no active transport infrastructure at Rippon Avenue (excluding footpaths).

Notwithstanding, Anna Maria King Park (located to the east of Rippon Avenue) is connected to the shared path as well.

Towards the end of the brine pipeline, Kissing Point Road connects to a shared path.

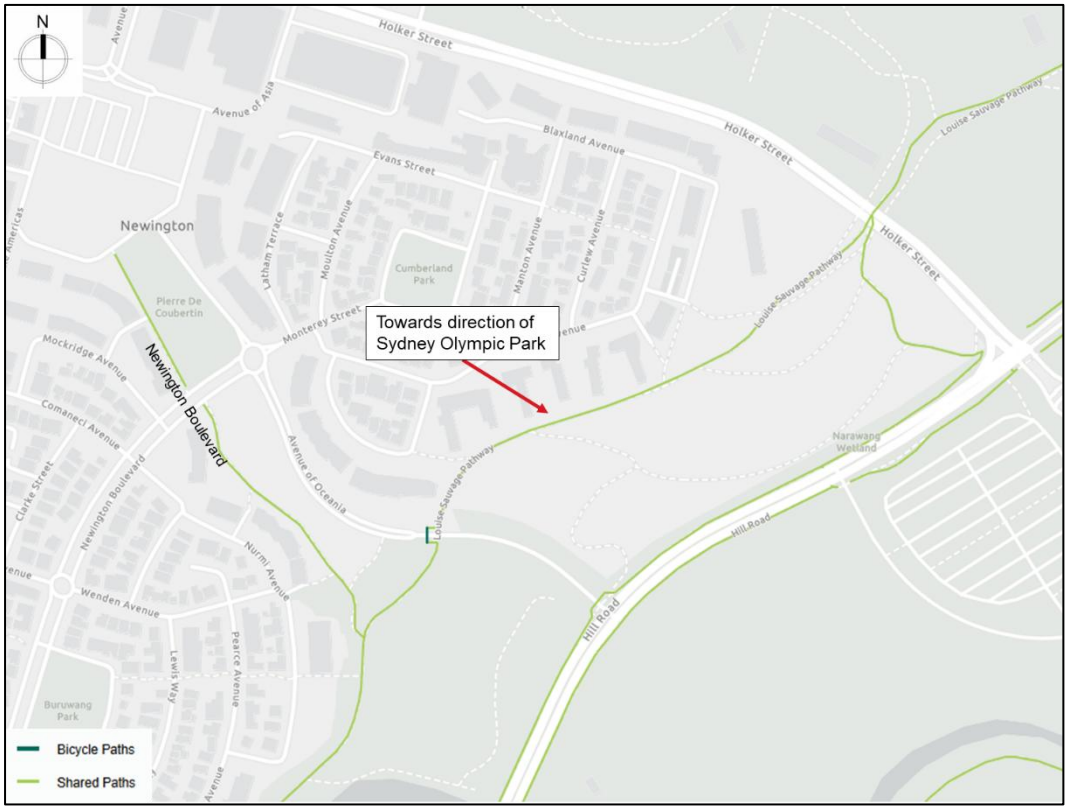
Construction impacts to the active transport infrastructure at this pipeline have been explored from Table 7.4 to Table 7.8.

## 5.5.4 River Release Pipeline

There is a shared path located towards the south of Newington Boulevard which may be closed during construction works. This is depicted in Figure 5-9. An alternative route via the footpaths on the eastern

side of Avenue of Oceania is proposed which connects from Avenue of Europe (from the west) toward Louise Sauvage Pathway (to the east) which eventually connects to Hill Road.

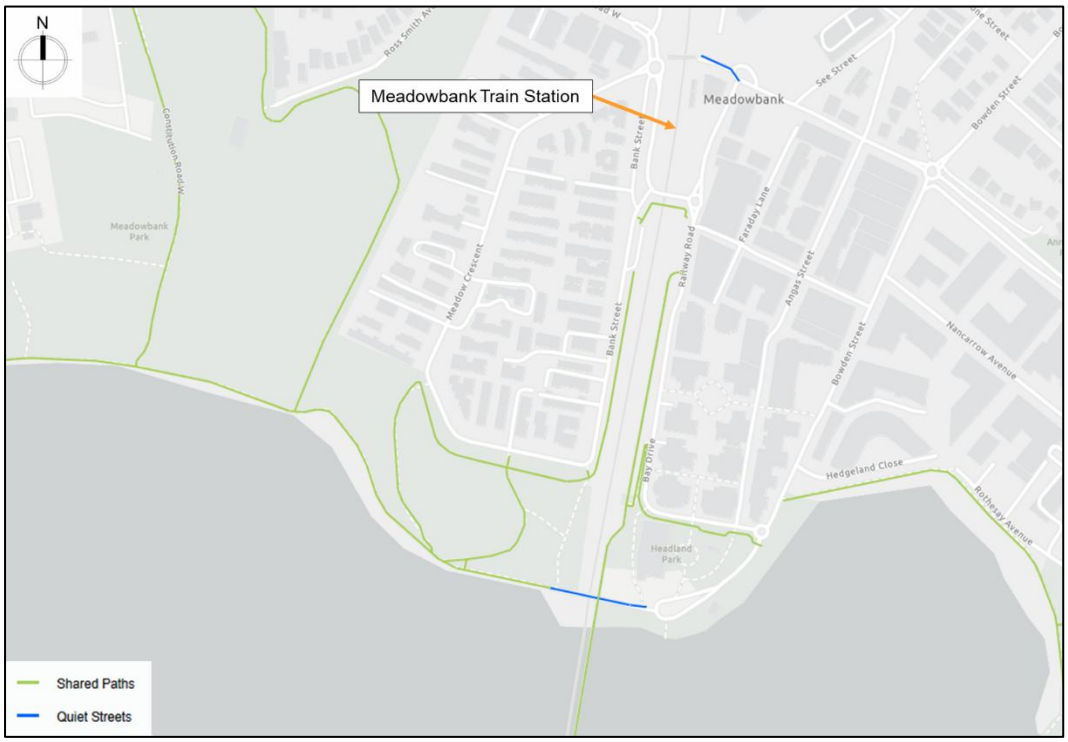
**Figure 5-9: Shared Paths near Newington Boulevard**




Base image source: Cycleway Finder I TfNSW, accessed July 2025
**Note:** Not to scale

There is also a shared path located towards the south of Meadow Crescent which may be closed during construction works. This is depicted in Figure 5-10. An alternative route is proposed via the footpaths on the eastern side of Bank Street and Railway Road which eventually connects to Bay Drive.

**Figure 5-10: Shared Paths near Meadow Crescent**




Source: TfNSW, Cycleway Finder I TfNSW, accessed June 2025
**Note:** Not to scale

Construction impacts for the active transport infrastructure at this pipeline have been explored from Table 7.9 to Table 7.14.

## 5.6 Safety

The following sections address crash statistics for streets and intersections surrounding the WRRF and Camellia pumping stations. An analysis of the most recent five-year period of available crash data (2019-2023) has been undertaken based on crash data provided by TfNSW.

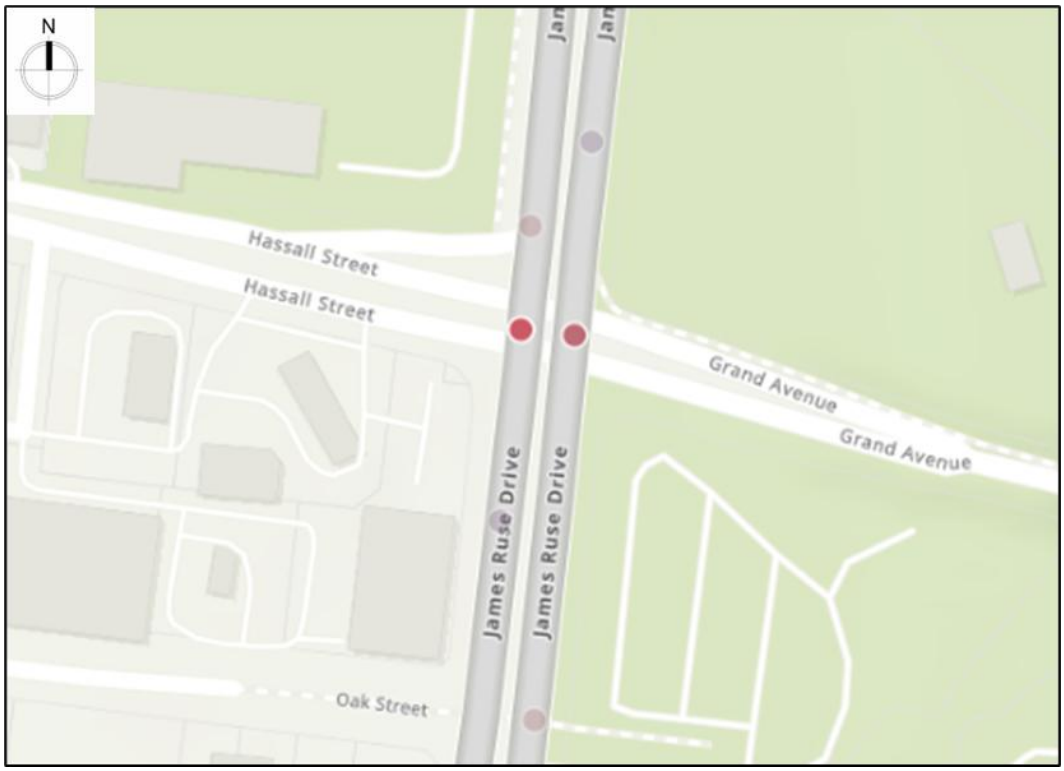
For the transfer and brine pipelines, refer to Table 7.3 to Table 7.8 within Section 7.2 which outline the crash statistics within the respective sections of these pipelines.

For the river release pipeline, refer to Table 7.9 to Table 7.14 within Section 7.3 which outline the crash statistics within the respective sections of this pipeline.

### 5.6.1 Grand Avenue/ James Ruse Drive

The crash data history for the five-year period (2019-2023) for Grand Avenue/ James Ruse Drive is shown in Figure 5-11 and summarised in Table 5.7.

**Figure 5-11: Crash Map from 2019 to 2023 – Grand Avenue/ James Ruse Drive**




Source: TfNSW, LGA view - crashes map | Transport for NSW, accessed June 2025
**Note:** Not to scale

**Table 5.7: Crash Incident Summary (2019 to 2023) – Grand Avenue/ James Ruse Drive**

| Degree of crash | Number of crashes | Number of people injured |
|---|---|---|
| **Minor/ other Injury** | 3 | 1 |
| **Moderate injury** | 4 | 3 |
| **Serious injury** | 1 | 2 |
| **Fatal injury** | 0 | 0 |
| **Total** | 8 | 6 |

No fatality was recorded during the five-year period at this intersection. Although there are eight recorded incidents over the five-year period, the data does not indicate any major safety concerns within the crash data.

Notably, the Road User Movement (RUM) code provides a description for the type of crashes that occur within a specific study area to predict any patterns of crash occurrences. This helps analyse why the crashes have occurred and what mitigation measures may be required to address these occurrences.

In this regard, the most common RUM code occurrence is 21 (right-through), which occurred at three different times across three different years.

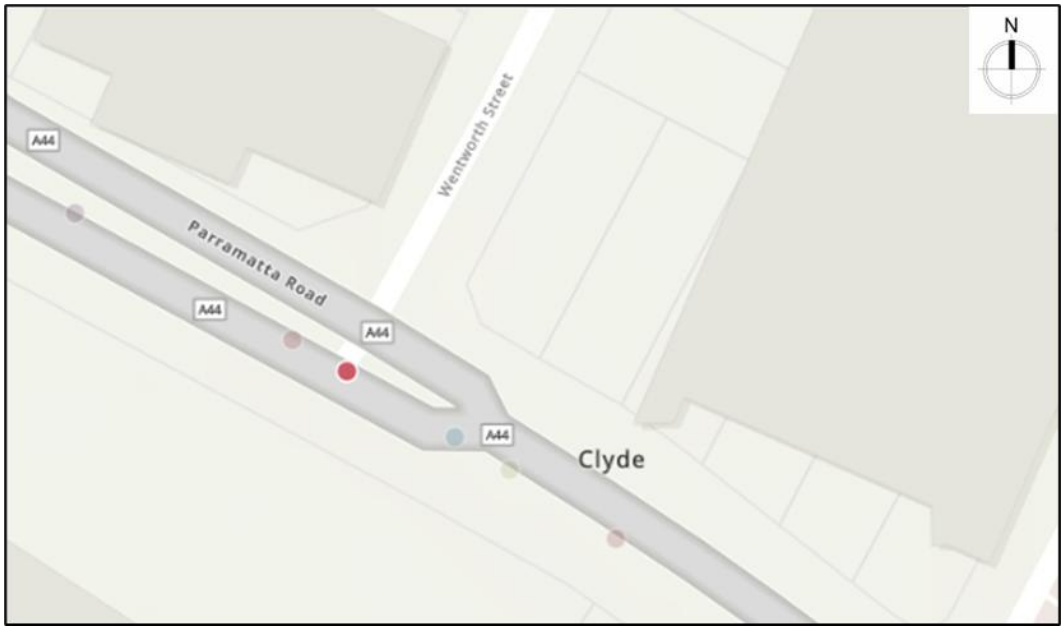
### 5.6.2 Grand Avenue/ Colquhoun Street

No crash incidents were reported at this intersection for the five-year period (2019-2023).

### 5.6.3 Wentworth Street/ Parramatta Road

The crash data history for the five-year period (2019-2023) for Wentworth Street/ Parramatta Road is shown in Figure 5-12 and summarised in Table 5.8.

**Figure 5-12: Crash Map from 2019 to 2023 – Wentworth Street/ Parramatta Road**




Source: TfNSW, LGA view - crashes map | Transport for NSW, accessed June 2025
**Note:** Not to scale

**Table 5.8: Crash Incident Summary (2019-2023) – Wentworth Street/ Parramatta Road**

| Degree of crash | Number of crashes | Number of people injured |
|---|---|---|
| **Minor/ other Injury** | 4 | 2 |
| **Moderate injury** | 1 | 1 |
| **Serious injury** | 2 | 2 |
| **Fatal injury** | 0 | 0 |
| **Total** | 7 | 5 |

No fatality was recorded during the five-year period at this intersection. Although there are seven recorded incidents over the five-year period, the data does not indicate any major safety concerns within the crash data. Notwithstanding, the most common RUM code occurrences are 30 (rear end) and 21 (right-through), with two occurrences of each.

## 5.7 Consideration for Special Events

The two major event venues close to, or within the study area include Rosehill Gardens Racecourse and Sydney Olympic Park.

During special events, there are additional dedicated bus services that support the movement of large numbers of people to these venues. The following sections describe the ways that patrons can currently travel to and from these major event venues.

### 5.7.1 Rosehill Gardens Racecourse

Rosehill Gardens Racecourse is a major events venue for the GPOP area and Greater Sydney. It hosts a range of racing and non-racing events throughout the year. Event patrons are currently able to travel to the racecourse via a ferry to Rydalmere Wharf or a train to Parramatta Station, then transfer to a bus service to Rosehill Gardens. This includes the M92 and 535 routes as well as supplementary bus shuttle services that may be provided by the Australian Turf Club. Patrons of the racecourse also benefit from the operation of PLR Stage 1 as it provides a connecting service between Parramatta Square and the Camellia light rail stop and extends the local and district catchment for spectators. The Camellia light rail stop is located 300 metres north of Grand Avenue near the main entrance of Rosehill Gardens Racecourse.

Taxi set down and pick up is permitted at the Rosehill Gardens Racecourse. Rosehill Gardens also provides a number of on-site car parking areas including accessible spaces for people with disabilities.

### 5.7.2 Sydney Olympic Park

Sydney Olympic Park hosts frequent events with an estimated 5,600,000 visitors per year to its venues. The largest events attract crowds greater than 60,000 people (mostly at night) but 98 per cent of all events staged at Sydney Olympic Park attract crowds under 25,000 which can be accommodated by regular public transport services. Patrons travelling to Sydney Olympic Park for large events (up to 50,000 people) currently use a variety of public transport services (bus and train) and then walk to the venue. Sydney Trains provides a ‘shuttle service’ for patrons transferring at Lidcombe (T7 Line) and there are bus stops serviced by routes 525, 526 and 533. During major events (> 60,000 people), a special event transport management plan is implemented which includes some road closures, bus stop relocations and additional signage along with additional public transport services. Special event trains are also provided directly to Sydney Olympic Park without requiring transfer at Lidcombe. Additional special event bus services operate which extend from Sydney Olympic Park to suburbs north and south of the Parramatta River. Routes include:

- Route 1A - Warriewood via Dee Why
- Route 1B - Warriewood via Mona Vale
- Route 2 - Glebe via Hunters Hill
- Route 4 - Maroubra
- Route 5A - Hills Showground
- Route 5B - Tallawong
- Route 6 - Woronora
- Route 7 - Cronulla
- Route 8 – Dural.

Routes 5A, 5B, 6, 7 and 8 travel either on Hill Road or Holker Street, which would both be impacted by the project.

There is generally no available on-street parking due to road closures for events in Sydney Olympic Park. The P1 to P8 car parks provide around 7,100 parking spaces in total, which patrons have the option to pre-book.

Notably, the P5 Sydney Olympic Park – Car Park is located adjacent to URBNSURF. The carpark for P5 would be utilised for construction works in stages during construction works at the river release pipeline. Impacts to this car park have been considered in Section 7.3.7.

The Sydney Olympic Park town centre also has 376 accessible and mobility car parking spaces for people with disabilities, with eight on-street accessible spaces on Showground Road, three on Herb Elliott Avenue, one on Murray Rose Avenue, five on Dawn Fraser Avenue and ten on Olympic Boulevard.

# 6 Overview of Construction Activities

## 6.1 Description of Construction Activities

Key activities for construction of the WRRF include:

- site establishment
- delivery of materials
- earthworks
- civil works
- structure construction
- installation of mechanical and electrical plant and equipment
- landscaping and rehabilitation
- commissioning.

The new sections of pipelines from the WRRF to Camellia pumping station and the river release location would be constructed using a combination of trenching and horizontal directional drilling (HDD) techniques. Between the Camellia pumping station and the NSOOS, the existing rising main would be relined and repurposed to form part of the brine pipeline.

The upgrade of the Camellia pumping station would include augmentation of underground infrastructure, installation of pumps and an upgrade of the power supply.

## 6.2 Construction Phasing and Programme

The expected duration of works is approximately 36 to 40 months commencing in Q1 2028 and concluding by Q2 2031 and would be carried out over a staged period. Following this schedule, it is expected that operation would commence in Q2 2031.

A summary of the indicative program and construction staging is summarised in Table 6.1.

**Table 6.1: Indicative Program and Construction Staging**

| Activity | Indicative timing |
|---|---|
| WRRF construction | Q3 2028 – Q4 2030 |
| Upgrade of the Camellia pumping station | Q2 2029 – Q2 2030 |
| Transfer pipeline construction | Q3 2028 – Q3 2029 |
| Brine pipeline construction | Q3 2028 – Q3 2029 |
| River release pipeline construction | Q3 2028 – Q3 2030 |
| River release structure | Q4 2029 – Q2 2030 |
| Commissioning | Q4 2030 – Q4 2031 |

The duration of works would vary. Peak construction traffic volumes are expected to occur in the earthworks and civil works phases when significant volumes of material would be transported to and from the respective worksites. For pipelines, where trenching occurs, the construction of the alignment progresses each day, meaning work sites move.

## 6.3 Work Hours

Construction would be carried out during the indicative standard working hours as defined by the Interim Construction Noise Guidelines (DECC, 2009a):

- Monday to Friday 7:00 am to 6:00 pm
- Saturday 8:00 am to 1:00 pm
- Sunday and public holidays no work.

However, due to the size and duration of the project, out of hours work may be required for certain project locations and activities. These include:

- delivery of oversized plant or structures that police or other authorities determine to require special arrangements to transport along public roads
- trenched pipeline construction along busy roads to minimise traffic impacts
- works that cannot be completed within the standard respite periods for engineering reasons. This includes large trenchless pipeline construction sections such as tunnelling and horizontal directional drilling which might require 24 hours for short periods of times (up to one month)
- construction activities within Parramatta River for the river release structure, e.g. use of barges to arrange pipes and concrete mattresses underwater, would require closures of Parramatta River to maritime traffic across two weekends for safety purposes. The timing would be planned in consultation with Transport for NSW, the Harbour Master and Sydney Ferries to minimise impacts on marine traffic.

The exact locations and duration of out of hours work would be determined during the construction planning phase of the project when a construction contractor has been engaged. Specific permits and approvals would be obtained, and communities would be notified of any out of hours works in line with the Interim Construction Noise Guidelines and as outlined in the project's Community and Stakeholder Engagement Plan.

The appointed contractor would be responsible for instructing and controlling all subcontractors regarding the hours of work. Any work outside the approved construction hours would be subject to specific prior approvals.

### 6.3.1 Construction Compounds

Table 6.2 summarises the proposed compounds within the respective pipeline segments.

**Table 6.2: Construction Segments and Compounds**

| Area | Construction Type | Construction Length | Number of Compounds |
|---|---|---|---|
| **Brine pipeline** | Reline | 765 m | 6 (C1 to C6) |
| | Reline | 20 m | 0 |
| | Reline | 650 m | 5 (C7 to C11) |
| | Reline | 80 m | 0 |
| | Reline | 440 m | 4 (C12 to C15) |
| **Brine and transfer pipelines** | Open trench | 255 m | 3 (C14 to C16) |
| | Trenchless | 1,120 m | 0 |
| **WRRF Site** | Not applicable | Site area | 1 (C17) |
| **River release pipeline** | Trenchless | 340 m | 1 (C18) |
| | Open trench | 1,400 m | 4 (C19, C22 to C24) |
| | Trenchless | 50 m | 2 (C20 to C21) |
| | Open trench | 1,400 m | 2 (C25 to C26) |
| | Trenchless | 650 m | 2 (C20 to C21) |
| | Open trench | 670 m | 1 (C27) |
| | Trenchless | 2,200 m | 3 (C26 to C28) |
| | Open Trench | 1,020 m | 4 (C28 to C31) |
| | | **Total** | 31 |

As noted in Table 6.2, there would be up to 31 compounds that would be set up for construction. The pipeline segments and compound locations have also been displayed within the respective figures in Sections 7.2 and 7.3.

Notably, even though there are different lengths of open trench identified, only a small section of trench construction would occur each day (at a typical length of approximately 20 to 50 metres) which would then be backfilled on the same day after installing the pipe. In this regard, impacts are minimised as much as practically possible.

Table 6.3 provides further detail on the duration, activities and estimated working hours for each compound.

**Table 6.3: Compound Details**

| Number | Location | Compound Type | Likely Duration | Hours of Construction |
|---|---|---|---|---|
| C1 | Kissing Point Road, Dundas | Satellite | 1 month | 24 hour (State Road) |
| C2 | Junction of Kissing Point Road and Rippon Avenue, Dundas | Satellite | 1 month | 24 hours (State Road) |
| C3 | Kissing Point Road verge, Dundas | Laydown | 1 month | 24 hours |
| C4 | Anderson Avenue, Dundas | Satellite | 1 month | Standard construction hours |
| C5 | Anna Maria King Park, Dundas | Satellite (pipe lining) | 1 month | Standard construction hours |
| C6 | Victoria Road North, Dundas | Satellite (pipe lining) | 1 month | 24 hours |
| C7 | Victoria Road South, Dundas | Satellite (pipe lining) | 1 month | 24 hours |
| C8 | Railway Street, Dundas | Satellite (pipe lining) | 1 month | Standard construction hours |
| C9 | Railway Street South, Parramatta | Satellite (pipe lining) | 1 month | Standard construction hours |
| C10 | Western Sydney University Carpark, Parramatta | Satellite (pipe lining) | 1 month | Standard construction hours |
| C11 | Western Sydney University South, Parramatta | Satellite (pipe lining) | 1 month | Standard construction hours |
| C12 | 181 James Ruse Drive, Camellia | Satellite (pipe lining) | 1 month | Standard construction hours |
| C13 | 175 James Ruse Drive, Camellia | Satellite (pipe lining) | 1 month | Standard construction hours |
| C14 | Grand Avenue North Car Park, Rosehill | Satellite | 4 months | 24 hours (intermittent) |
| C15 | Camellia pumping station compound | Main | 24 months | Standard construction hours |
| C16 | Grand Avenue, Rosehill | Tunnelling | 4 months | 24 hours (intermittent) |
| C17 | WRRF Compound | Main | 36 months | 24 hours (for 3 months) otherwise standard construction hours with occasional OOHW |
| C18 | Carnarvon Street, Silverwater | Tunnelling | 4 months | Standard construction hours, some OOHW intermittently |
| C19 | Derby Street, Silverwater | Satellite | 18 months | Out of hours (Night time/weekend) |
| C20 | Silverwater Road West, Silverwater | Tunnelling | 4 months | 24 hours |
| C21 | Silverwater Road East, Silverwater | Tunnelling | 4 months | 24 hours |
| C22 | Hume Park, Silverwater | Satellite | 18 months | Standard construction hours |
| C23 | Grey Street, Silverwater | Satellite | 18 months | 24 hours |
| C24 | Deakin Park, Silverwater | Satellite | 18 months | Standard construction hours |
| C25 | Pierre de Coubertin Park North, Silverwater | Satellite | 18 months | Standard construction hours |

| Number | Location | Compound Type | Likely Duration | Hours of Construction |
|---|---|---|---|---|
| C26 | Pierre de Coubertin Park South, Silverwater | Tunnelling | 6 months | Standard construction hours |
| C27 | URBN Surf Carpark, Olympic Park | Tunnelling | 6 months (Carpark A)<br>8 months (Carpark B) | Standard construction hours (Carpark A)<br>24 hours (Carpark B) |
| C28 | Meadowbank Park, Meadowbank | Main | 8 months | 24 hours |
| C29 | Meadow Crescent/Memorial Park | Satellite | 7.5 months | Standard construction hours |
| C30 | John Whitton Bridge West, Meadowbank | Satellite | 6 months | Standard construction hours with 2 x 24 hour weekends |
| C31 | John Whitton Bridge East, Meadowbank | Satellite | 6 months | Standard construction hours |

## 6.4 Construction Worker Volumes

The construction worker volumes are expected to vary throughout the project. The WRRF would require the highest number of construction workers throughout the construction program. It is likely that the construction workforce required at the WRRF would peak at a maximum of 200 workers during the mechanical and electrical installation phase. This is because the earthworks phase is substantially lower than normal, due to the site environmental management works project undertaken by Sydney Water before this project.

The estimated workforce numbers for each construction phase as provided by Sydney Water are summarised in Table 6.4.

**Table 6.4: Estimated Workforce at each Construction Stage**

| Activity | Task within Activity | Daily Indicative Workforce Numbers |
|---|---|---|
| **WRRF construction** | Site establishment, mobilisation | 13 |
| | Site earthworks, stockpiling, storage and removal of materials | 12 |
| | Civil works | 67 |
| | Structural construction work | 133 |
| | Mechanical and electrical installation | 200 |
| | Demobilisation and landscaping | 67 |
| | Commissioning | 67 |
| **Camellia pumping station upgrade** | Site establishment, mobilisation | 20 |
| | Mechanical and electrical installation | 30 |
| | Demobilisation | 10 |
| **Transfer and brine pipeline construction (including relining section)** | Site establishment, mobilisation | 12 |
| | Excavation works | 30 |
| | Pipeline installation | 30 |
| | Relining Works | 12 |
| | Demobilisation and restoration | 12 |
| **River release pipeline construction** | Site establishment, mobilisation | 19 |
| | Excavation works | 25 |
| | Pipeline installation | 25 |
| | Outlet Construction | 25 |
| | Demobilisation and restoration | 13 |

## 6.5 Construction Worker Parking

Parking for construction workers would be provided within the WRRF site. During construction planning, Sydney Water would consider providing worker parking within the project impact areas (e.g. compounds). However, if space is limited it is likely that workers would park on local roads adjacent to the impact area or adjacent to compound sites. Workers would also be encouraged to utilise the public and active transport network.

Sections 7.2 and 7.3 outline the specific construction worker parking locations whilst the construction works are occurring.

## 6.6 Construction Vehicle Types

Various construction vehicle types are expected to access the compounds which include classifications for both light and heavy vehicles. OSOM vehicles may be required to make deliveries to the project site during construction. However, the need for OSOM movements has not yet been confirmed. An OSOM permit issued by the National Heavy Vehicle Regulator would be required if deliveries involve OSOM vehicles that do not comply with the prescribed mass or dimension limits under the Heavy Vehicle (Mass, Dimension and Loading) National Regulation 2013 or any applicable State notice under the

Heavy Vehicle National Law (NSW). If it is confirmed that OSOM movements are required, impacts of these movements would be assessed, considering the number of OSOM movements, vehicle dimensions, assumed axel loads and any intersection upgrade works required. Swept path analysis would also be undertaken to inform the assessment.

Construction traffic would be generated by the delivery of equipment and materials, as well as construction workers travelling to and from the compounds daily as detailed below. The vehicles to be used by construction contractor(s) are not limited to those listed and a detailed Construction Traffic Management Plan (CTMP) would be required to provide greater detail on the types of vehicles to be used for the construction works:

- light vehicles
- truck and dogs
- concrete trucks
- cranes
- semi-trailers.

## 6.7 Construction Traffic Volumes

### 6.7.1 Light Vehicles (LV)

The estimated LV movements are provided by Sydney Water and have been summarised in Table 6.5 for the different construction locations.

**Table 6.5: Estimated Daily and Peak LV Movements**

| Construction Location | Estimated Daily LV Movements (Inbound and Outbound) | Estimated AM Peak Hour LV Movements (Inbound) | Estimated PM Peak Hour LV Movements (Outbound) |
|---|---|---|---|
| **WRRF site** | 400 | 140 | 140 |
| **Transfer and brine pipelines (WRRF to camellia pumping station)** | 30 | 11 | 11 |
| **Brine pipeline, relining section (Camellia pumping station to NSOOS)** | 24 | 9 | 9 |
| **River release pipeline** | 10 to 15 | 4 to 6 | 4 to 6 |
| **Camellia pumping station upgrade** | 30 | 11 | 11 |

As construction hours are set between 7.00 am and 6.00 pm on weekdays, and 8.00 am to 1.00 pm on Saturdays it is likely that most movements to and from each construction site would occur outside of the peaks. However, as a conservative approach it is assumed that approximately 70% of the daily construction movements would occur during the following AM/ PM peaks:

- **AM Peak:** 7:00 am to 8:00 am

- **PM Peak:** 5:15 pm to 6:15 pm.

### 6.7.2 Heavy Vehicles (HV)

The estimated HV movements are provided by Sydney Water and have been summarised in Table 6.6 for the different construction locations. Notably, the HV movements would be spread evenly across the respective construction hours. Whether OSOM vehicles are required would be confirmed in detailed design. If OSOM vehicles are required, low risk and high risk OSOM vehicle movements would be assessed.

**Table 6.6: Estimated Daily and Peak HV Movements**

| Construction Location | Estimated Daily HV Movements (Inbound and Outbound) | Estimated AM/ PM Peak Hour HV Movements (Inbound and Outbound) |
|---|---|---|
| **WRRF Site** | 300 | 38 |
| **Transfer and brine pipelines (WRRF to Camelia pumping station) - per section** | 2 | 2 |
| **Brine pipeline, relining section (Camelia pumping station to NSOOS) - per section** | 1 | 1 |
| **River release pipeline - per section** | 10 to 20 | 2 to 3 |
| **Camellia pumping station upgrade** | 30 | 4 |

### 6.7.3 Total Daily and Peak Hour Volumes

With regards to the total daily and AM/ PM peak hour traffic movements, Table 6.7 indicates the total LV and HV movements (adopting the upper level of movements for the river release pipeline) within the respective construction locations.

**Table 6.7: Estimated Daily and Peak Construction Vehicle Movements**

| Construction Location | Type of Vehicle | Estimated Daily Movements | Estimated AM/ PM Peak Hour Movements |
|---|---|---|---|
| **WRRF site** | LV | 400 | 140 |
| | HV | 300 | 38 |
| **Transfer and brine pipelines (WRRF to camellia pumping station)** | LV | 30 | 11 |
| | HV | 2 | 2 |
| **Brine pipeline (Camellia pumping station to NSOOS)** | LV | 24 | 9 |
| | HV | 1 | 1 |
| **River release pipeline** | LV | 15 | 6 |
| | HV | 20 | 3 |
| **Camellia pumping station upgrade** | LV | 30 | 11 |
| | HV | 30 | 4 |

## 6.8 Construction Vehicle Routes

### 6.8.1 WRRF

Generally, construction vehicles have origins and destinations from a wide variety of locations throughout Sydney.

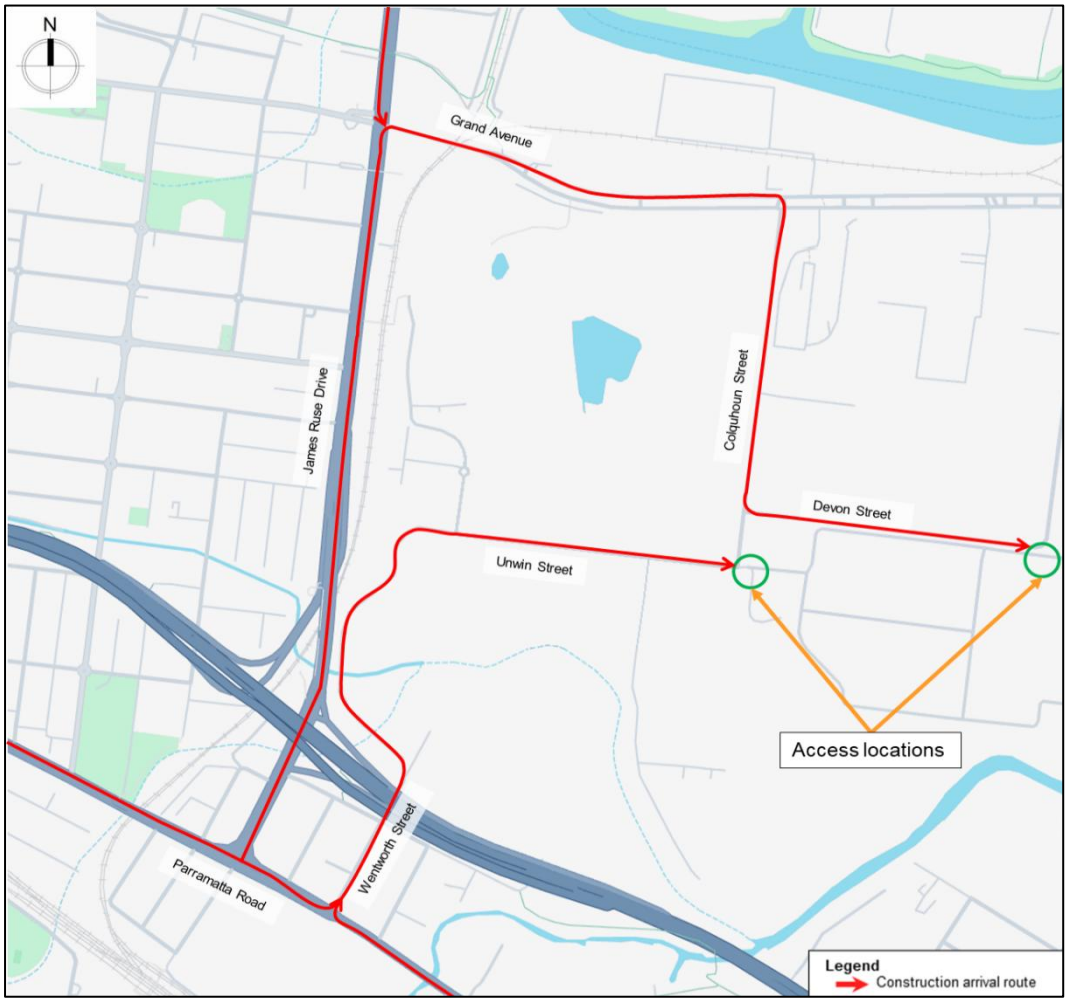
Construction vehicle routes for works should be planned to prioritise the use of state roads wherever possible, aiming to minimise travel distances to and from the motorway and arterial road network. These roads are designed to support the movement of people and goods between cities and urban centres and are therefore more suitable for accommodating construction-related traffic.

Use of regional and local roads should be restricted to those segments that are essential for accessing specific construction sites. This approach helps reduce the overall impact on the surrounding precinct, as regional and local roads serve more diverse functions, including pedestrian and cyclist movements, property access, kerbside parking, and local street activity and are more sensitive to disruption.

Any specific road segments that should be avoided by construction vehicles should be clearly identified in the Construction Traffic Management Plan (CTMP). These restrictions must be communicated to all construction personnel and delivery drivers before the commencement of works.

Truck drivers would be advised of the designated heavy vehicle routes to and from the site. The directional distribution and assignment of traffic would be influenced by several factors, most notably the origin and destination of materials and configuration of the arterial road network. Figure 6-1 shows the anticipated transport routes to the WRRF site (C17).

**Figure 6-1: Construction Vehicle Approach Routes**




Source: Google Maps
**Note:** Not to scale

It is noted that construction vehicles heading towards the Devon Street access point would be travelling from James Ruse Drive to enter the WRRF site and would travel via the James Ruse Drive/ Grand Avenue and Grand Avenue/ Colquhoun Street intersections. Construction vehicles heading towards the Unwin Street access point would be travelling from either side of Parramatta Road and then turn onto Wentworth Street to enter the WRRF site.

Figure 6-2 displays the anticipated transport routes from the WRRF.

**Figure 6-2: Construction Vehicle Departure Routes**


Source: Google Maps
**Note:** Not to scale

In order to exit the Devon Street access point, vehicles would travel back onto James Ruse Drive to head northbound or southbound. For the Unwin Street access point, vehicles would head back towards Parramatta Road via Wentworth Street.

### 6.8.2 Transfer Pipeline and Brine Pipeline

When travelling to the brine pipeline, relining section (Camellia pumping station to NSOOS), LV and HV would travel to and from James Ruse Drive to the WSU – Parramatta Campus' internal private roads, Victoria Road, Rippon Avenue and Kissing Point Road (C1 to C11).

When travelling to the transfer pipeline and brine pipeline (WRRF to Camellia pumping station), LV and HV would travel to and from James Ruse Drive to Grand Avenue to enter and exit the respective compounds (C12 to C16).

This is further detailed in Section 7.2.

### 6.8.3 River Release Pipeline

The assessment of the river release pipeline has been cordoned off into nine different sections. An overview of the likely construction vehicle routes is outlined below:

- **River release pipeline sections 1 and 2:** LV and HV would travel to and from the Western Motorway to Beaconsfield Street, Silverwater Road, Carnarvon Street, Vore Street and Derby Street to enter and exit the respective compounds (C18 to C20 and C22 to C24)
- **River release pipeline section 3:** LV and HV would travel to and from the Western Motorway to Silverwater Road, Derby Street, Day Street North and Fariola Street to enter and exit the respective compounds (C21)
- **River release pipeline section 4:** LV and HV would travel to and from the Western Motorway to Hill Road, John Ian Wing Parade, Newington Boulevard, Comaneci Avenue and Ali Parade to enter and exit the respective compounds (C25 to C26)
- **River release pipeline sections 5, 6 and 7:** LV and HV would travel to and from the Western Motorway to Silverwater Road, Hill Road and Holker Street to enter and exit the respective compounds (C27)
- **River release pipeline sections 8 and 9:** LV and HV would travel to and from Victoria Road to Adelaide Street and Constitution Road to enter and exit the respective compounds (C28 to C31).

This is further detailed in Section 7.3.

# 7 Construction Impact Assessment

This section details the assessment undertaken to ascertain the traffic and transport impacts of the project during its construction stage.

## 7.1 WRRF

### 7.1.1 Assessment Scenarios

To identify the traffic and transport impacts associated with the project during construction, the following scenarios were assessed for the three intersections, as previously discussed in section 3.4 and summarised below:

- **2025 baseline** - existing traffic volumes which include surrounding construction projects
- **2028 baseline** (as this is the period of peak construction) – existing plus 1.5% growth
- **2028 with construction traffic** – includes construction traffic as part of this project.

Traffic summary diagrams for the 2025 baseline scenario were previously provided in section 3.5.2.

### 7.1.2 2028 Baseline

Traffic summary diagrams are shown in Figure 7-1 and Figure 7-2, indicating the future base case scenario volumes in 2028 for the AM and PM peaks.

**Figure 7-1: Future Base Case (2028) - AM Peak Hour Traffic Volumes**

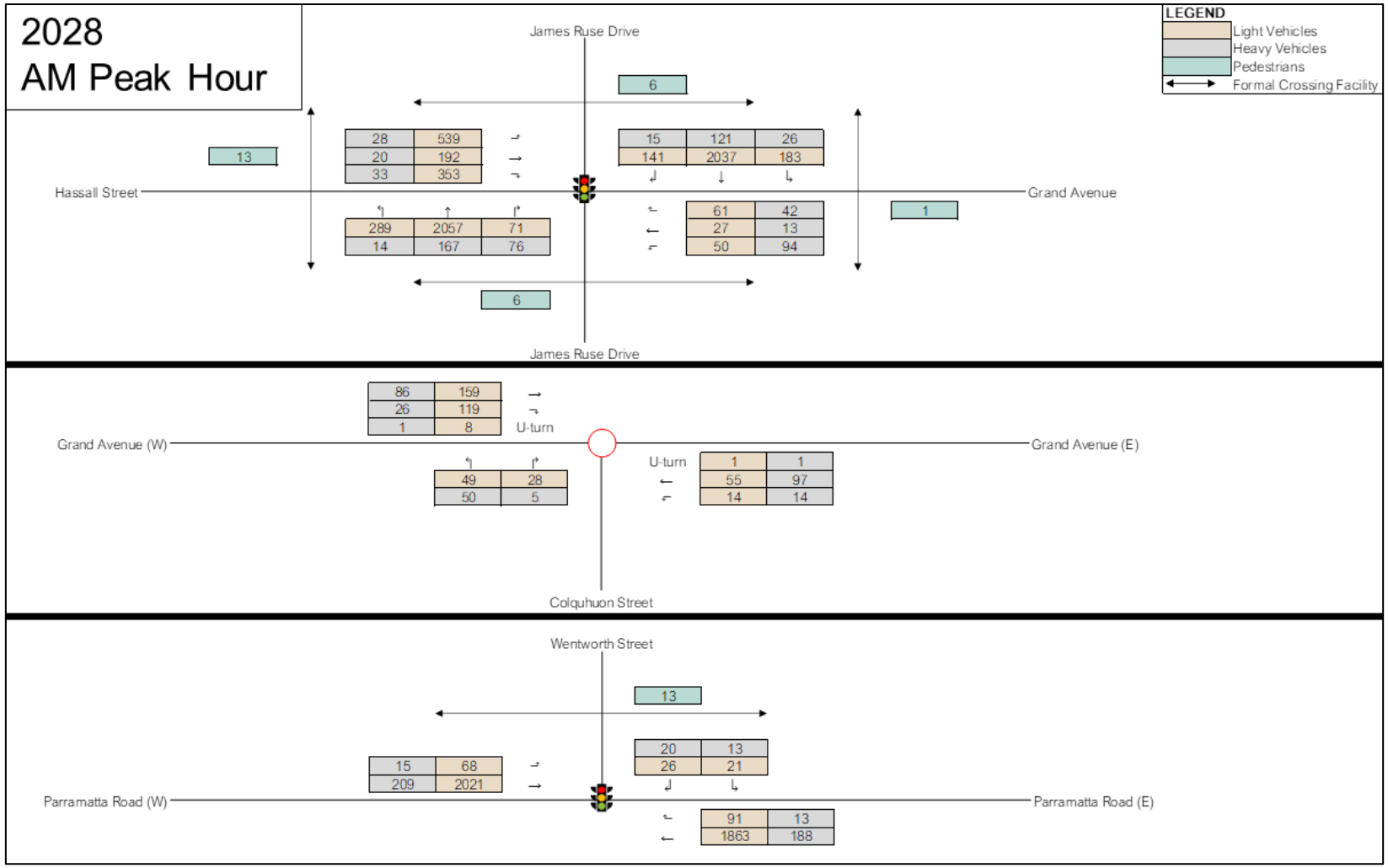
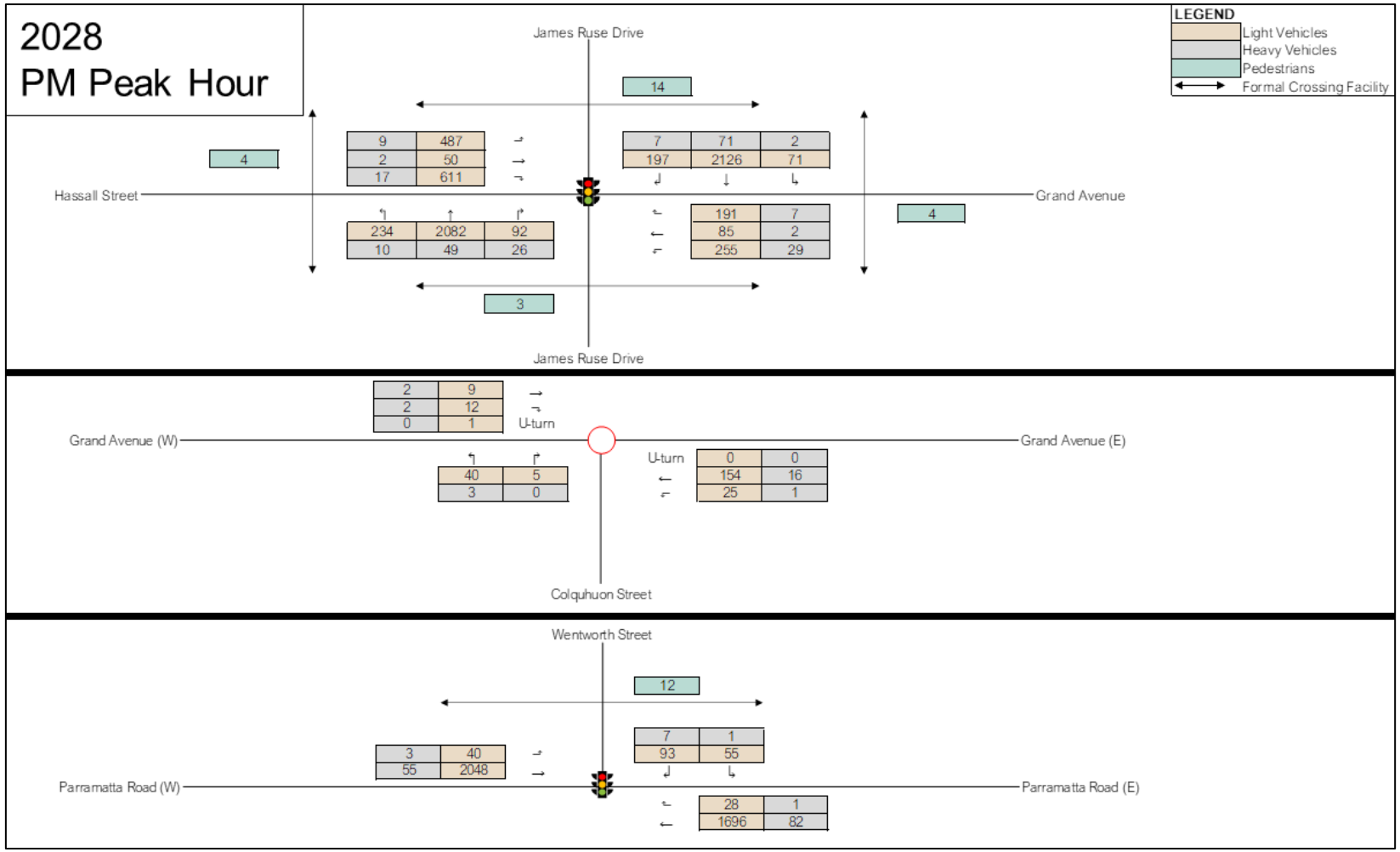


**Figure 7-2: Future Base Case (2028) - PM Peak Hour Traffic Volumes**



### 7.1.3 Construction Traffic Distribution

An overview of the construction traffic generation was provided in Section 6.7. With regards to distribution, the expected inbound and outbound traffic distributions are detailed in the following sections.

#### 7.1.3.1 Inbound Construction Traffic

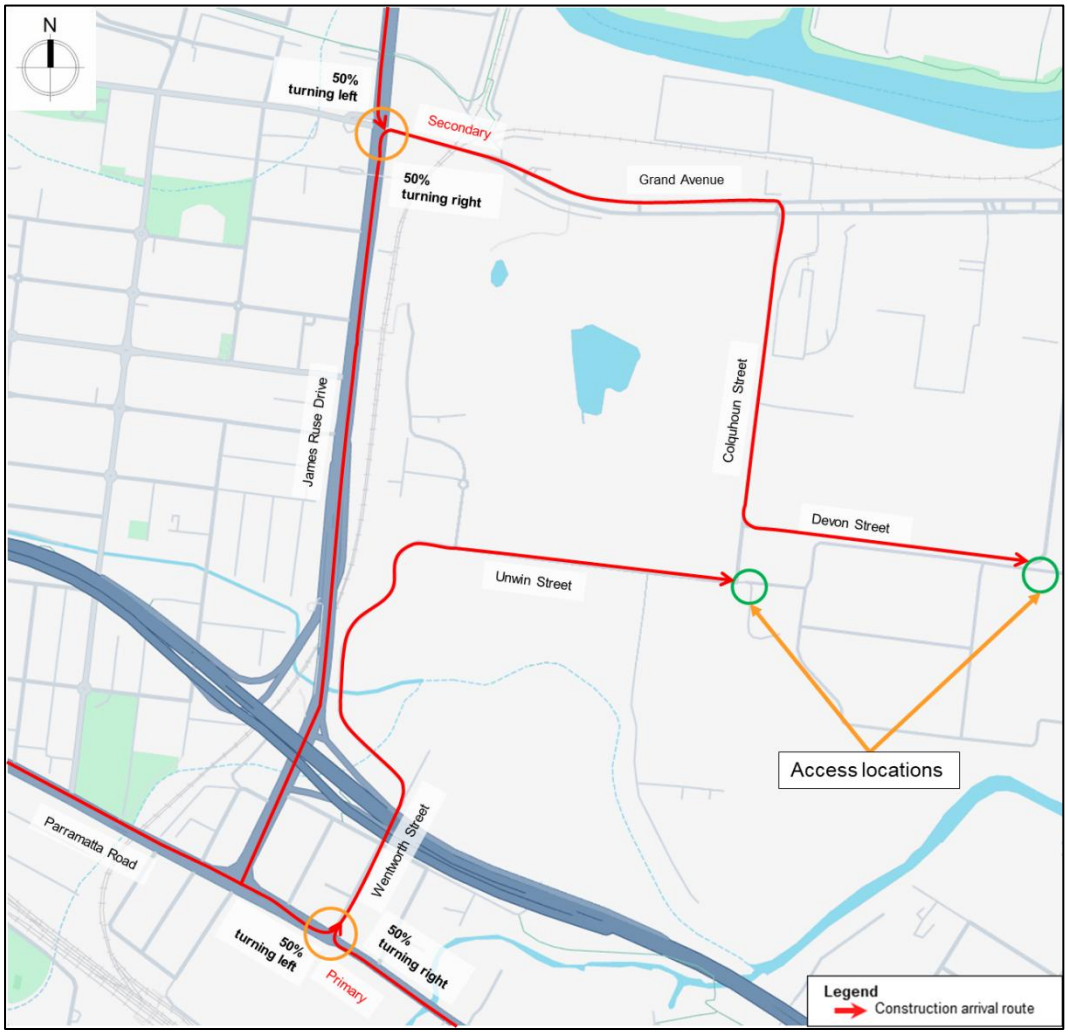
With regards to traffic distribution, it is noted that construction vehicles (both LV and HV) would utilise either the James Ruse Drive/ Grand Avenue or the Wentworth Street/ Parramatta Road intersections to access the WRRF. Notably, the Wentworth Street/ Parramatta Road intersection would be the main access point for most construction vehicles. However, the Western Motorway bridge (at the Wentworth Street/ Parramatta Road intersection) has a height restriction for HV up to 4.6 metres. As some construction HVs might require a height clearance greater than 4.6 metres, the following traffic distribution provides an allowance for construction vehicles to also utilise the James Ruse Drive/ Grand Avenue intersection. In this regard, the Wentworth Street/ Parramatta Road intersection is the primary route and the James Ruse Drive/ Grand Avenue/ intersection is the secondary route.

At the James Ruse Drive/ Grand Avenue intersection, construction vehicles would be split evenly (50%) across the right and left turns into Grand Avenue from James Ruse Drive.

At the Wentworth Street/ Parramatta Road intersection, construction vehicles would be split evenly (50%) across the right and left turns into Wentworth Street from Parramatta Road.

This is displayed within Figure 7-3.

**Figure 7-3: Inbound Construction Vehicle Distribution to the WRRF**




**Note:** Not to scale

### 7.1.3.2 Outbound Construction Traffic

When exiting, construction vehicles would utilise the same routes as those outlined in Section 7.1.3.1. In this regard, the Wentworth Street/ Parramatta Road intersection is the primary route, and the James Ruse Drive/ Grand Avenue intersection is the secondary route.

At the James Ruse Drive/ Grand Avenue intersection, construction vehicles would be split evenly (50%) across the right and left turns into Grand Avenue from James Ruse Drive.

The main difference between the inbound and outbound construction vehicle movements is when construction vehicles use the Wentworth Street/ Parramatta Road intersection to exit. Construction vehicles would only be utilising the left turn out of Wentworth Street (100%) onto Parramatta Road, to reduce impacts at the Wentworth Street/ Parramatta Road intersection.

Contingencies have been made for vehicles that need to travel westbound on Parramatta Road, with a secondary route at the James Ruse Drive/ Grand Avenue intersection. Vehicles would be able to head

westbound on Parramatta Road by heading towards the James Ruse Drive/ Grand Avenue intersection and then heading southbound on James Ruse Drive.

This is displayed within Figure 7-4.

**Figure 7-4: Outbound Construction Vehicle Distribution from the WRRF**


**Note:** Not to scale

### 7.1.3.3 Movement Summary Diagrams

With regards to distribution across the two access points, movement summary diagrams are presented in Figure 7-5 and Figure 7-6, indicating the AM/ PM peak construction traffic volumes in 2028.

**Figure 7-5: Construction Traffic Volumes (2028) - AM Peak Hour**

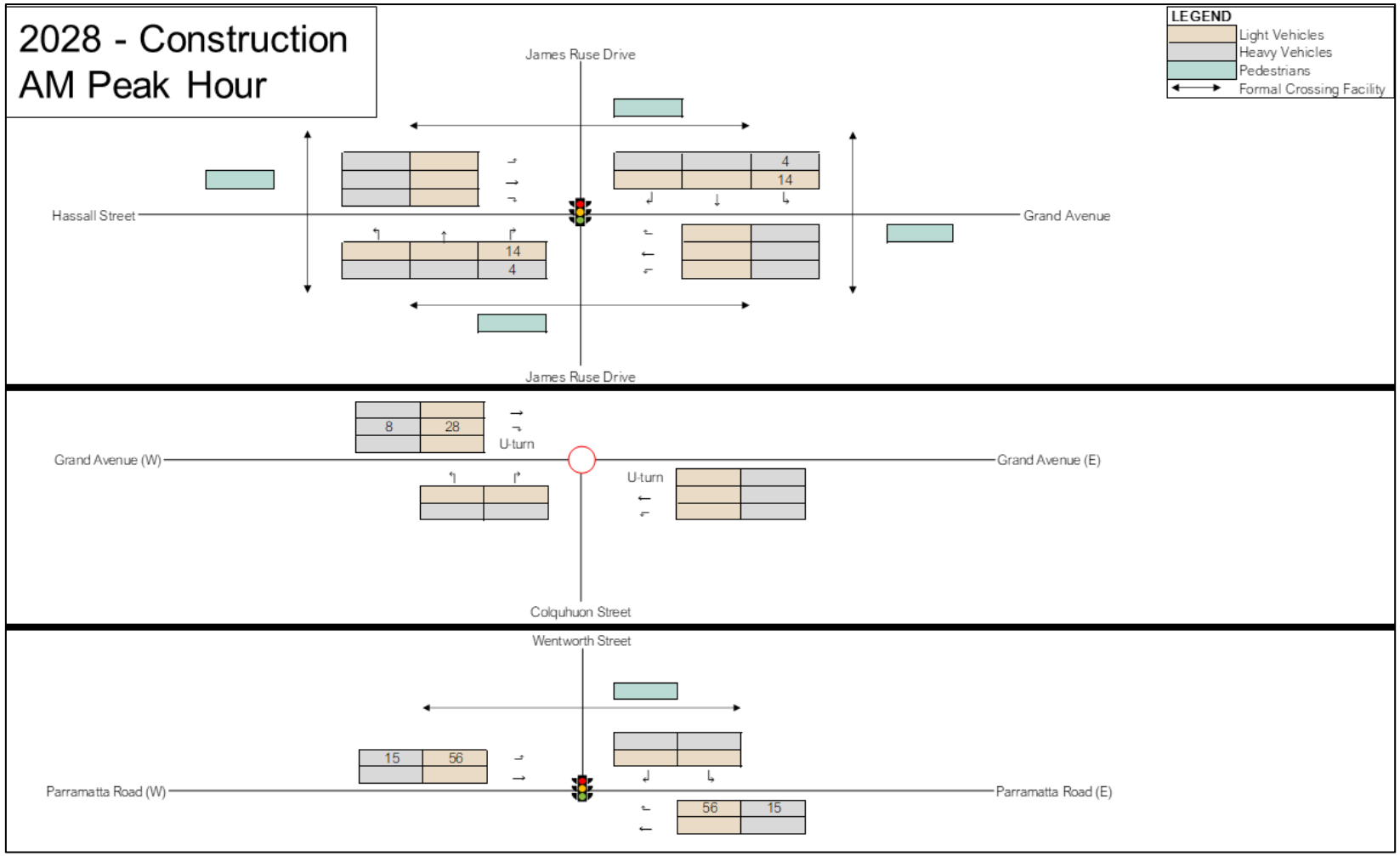
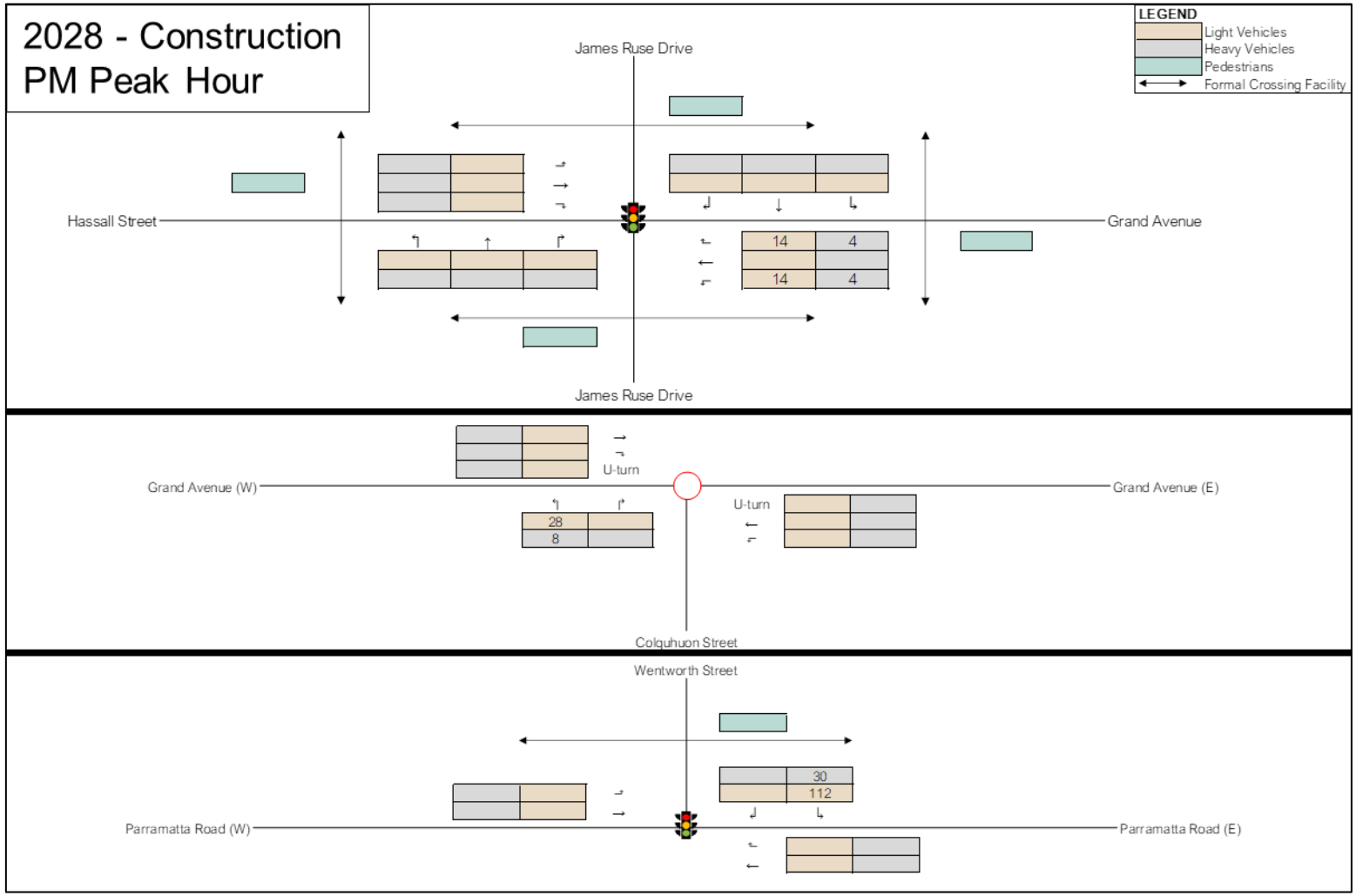


**Figure 7-6: Construction Traffic Volumes (2028) - PM Peak Hour**



### 7.1.4 Modelling Results Summary (2028 Without and With Construction Traffic)

Table 7.1 presents a summary of the future modelling results in 2028 in the AM peak for each of the intersections, without and with the construction traffic. Full results are presented in **Appendix B** of this report.

**Table 7.1: Future Case (2028) Modelling Results – AM Peak**

| Intersection | Average Delay (Sec) | LoS | DoS | 95th Percentile Queue (m) |
|---|---|---|---|---|
| **Without Construction Traffic** | | | | |
| **James Ruse Drive/ Grand Avenue** | 84 | F | 1.012 | 659 |
| **Grand Avenue/ Colquhoun Street** | 11 | A | 0.270 | 16 |
| **Wentworth Street/ Paramatta Road** | 130 | F | 1.226 | 1204 |
| **With Construction Traffic** | | | | |
| **James Ruse Drive/ Grand Avenue** | 98 | F | 1.064 | 704 |
| **Grand Avenue/ Colquhoun Street** | 11 | A | 0.288 | 17 |
| **Wentworth Street/ Paramatta Road** | 143 | F | 1.249 | 1287 |

Based on the above assessment, it is evident that the Grand Avenue/ Colquhoun Street intersection performs well with minimal queuing, delays and a low DoS (significantly less than 1), without and with construction traffic.

However, the James Ruse Drive/ Grand Avenue intersection operates unsatisfactorily in the base case AM peak scenario with a DoS of 1.012, delay of 84 seconds and a LoS F. With the addition of construction traffic, there is an increase in average delay (up to 14 seconds), DoS (up to 0.05) and increase in queuing (up to 45 metres). The same applies to the Wentworth Street/ Parramatta Road intersection. It performs unsatisfactorily in the base case scenario with a DoS of 1.226, delay of 130 seconds and a LoS F. With the addition of construction traffic, there is an increase in average delay (up to 13 seconds), DoS (up to 0.02) and queuing of up to 83 metres.

Certain mitigation measures have been discussed within Section 10 to alleviate the impacts of construction traffic impacts during the AM Peak at the James Ruse Drive/ Grand Avenue and Wentworth Street/ Parramatta Road intersections.

Table 7.2 presents a summary of the future modelling results in 2028 for the PM peak for each of the intersections, without and with construction traffic. Full results are presented in **Appendix B** of this report.

**Table 7.2: Future Case (2028) Modelling Results – PM Peak**

| Intersection | Average Delay (Sec) | LoS | DoS | 95th Percentile Queue (m) |
|---|---|---|---|---|
| **Without Construction Traffic** | | | | |
| **James Ruse Drive/ Grand Avenue** | 149 | F | 1.115 | 741 |
| **Grand Avenue/ Colquhoun Street** | 9 | A | 0.159 | 6 |
| **Wentworth Street/ Paramatta Road** | 100 | F | 1.144 | 943 |
| **With Construction Traffic** | | | | |
| **James Ruse Drive/ Grand Avenue** | 156 | F | 1.126 | 746 |
| **Grand Avenue/ Colquhoun Street** | 9 | A | 0.168 | 7 |
| **Wentworth Street/ Paramatta Road** | 101 | F | 1.141 | 950 |

Based on the above assessment, it is clear that the Grand Avenue/ Colquohon Street performs well with minimal queuing, delays and a low DoS (significantly less than 1), without and with construction traffic.

However, the James Ruse Drive/ Grand Avenue intersection operates unsatisfactorily in the base case PM peak scenario with a DoS of 1.115, delay of 149 seconds and a LoS F. With the addition of construction traffic, there is a slight increase in average delay (up to 7 seconds), DoS (up to 0.01) and slight increase in queuing (up to 5 metres). The same applies to the Wentworth Street/ Parramatta Road intersection. It performs unsatisfactorily in the base case scenario with a DoS of 1.144, delay of 100 seconds and a LoS F. With the addition of construction traffic, there is very slight increase in average delay (up to 1 second) and minor increase in queuing (up to 7 metres).

In this regard, the SIDRA INTERSECTION modelling results indicate that the addition of construction traffic during the PM peak period for the worst-case conservative scenario would have minimal traffic impacts at the James Ruse Drive/ Grand Avenue, Grand Avenue/ Colquohon Street and Wentworth Street/ Parramatta Road intersections.

### 7.1.5 Modelling Conclusions

In conclusion, the Grand Avenue/ Colquhoun Street intersection in the base case (2025) and future base case (2028) scenarios operates well, and continues to perform well with the addition of construction traffic.

The James Ruse Drive/ Grand Avenue and Wentworth Street/ Parramatta Road intersections operate unsatisfactorily with a poor LoS, high average delay, high DoS and high queue lengths both in the base case (2025) and future base case (2028) scenarios.

With the addition of construction traffic at both intersections during the AM Peak, it is noted that certain mitigation traffic management measures may be required which are outlined within Section 10.

With the addition of construction traffic at both intersection during the PM Peak, the traffic impacts are minimal when compared to the future base case scenario.

## 7.2 Transfer Pipeline and Brine Pipeline

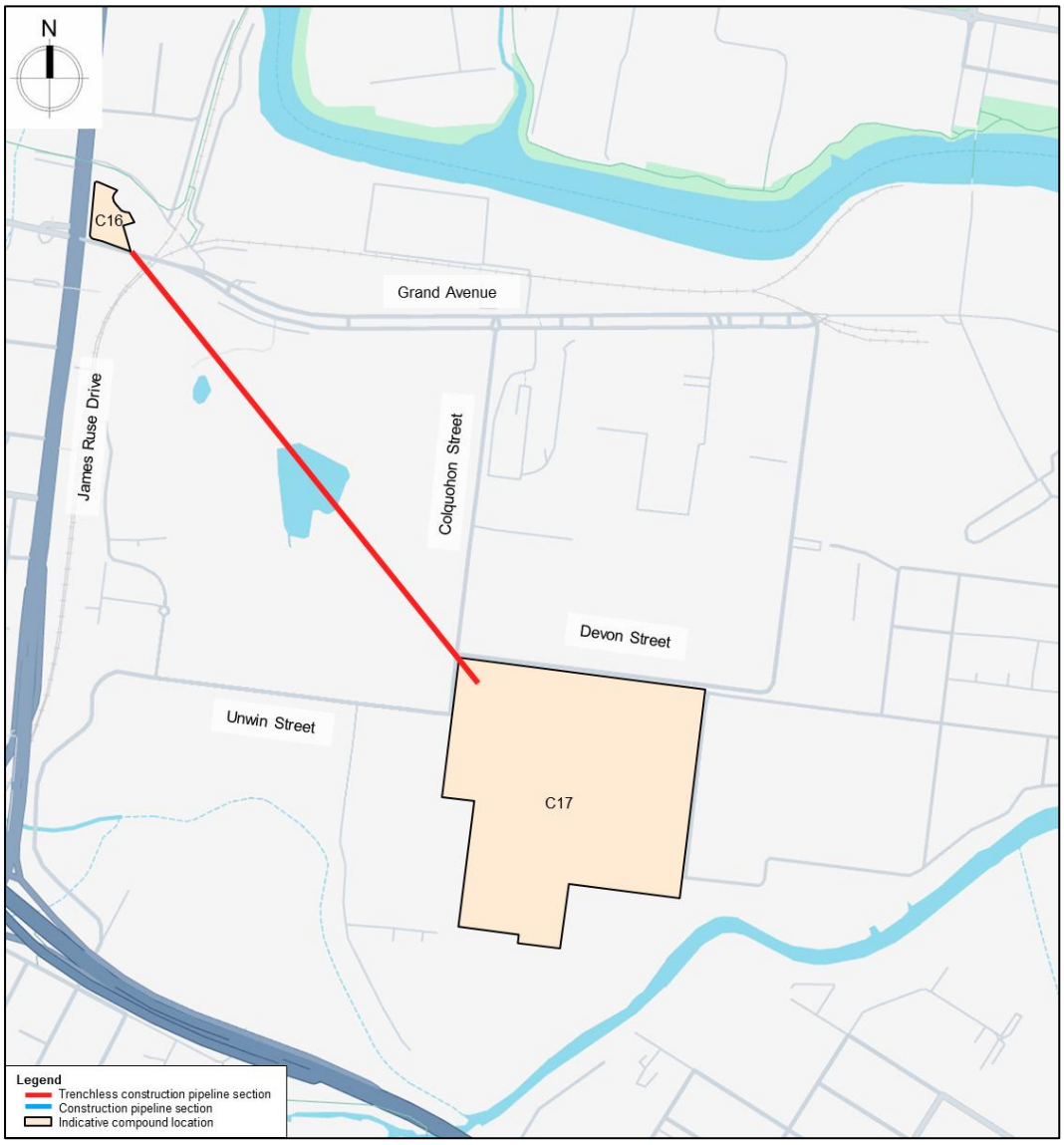
The assessment of the impacts associated with the construction of the transfer pipeline and brine pipeline has been carried out for seven different sections, which are outlined within Sections 7.2.1 to 7.2.7.

Construction impacts including impacts to public transport, active transport, compound activities such as light and heavy vehicle access points and numbers have been described for each pipeline in the respective sections below.

### 7.2.1 Transfer Pipeline Section 1

The transfer pipeline section 1 is shown in Figure 7-7.

**Figure 7-7: Transfer Pipeline Section 1**



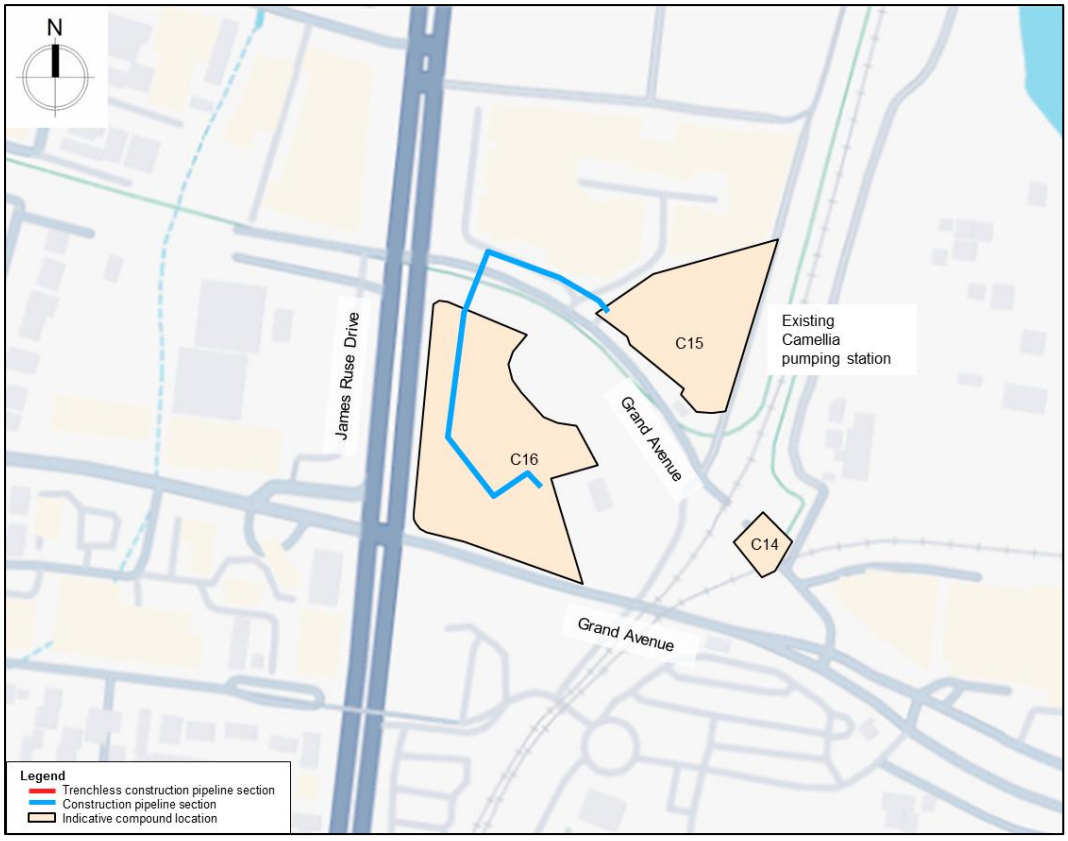

**Note:** Not to scale

Trenchless construction works are expected to occur at this section. In this regard, low traffic impacts are expected within this section of the transfer pipeline during construction.

### 7.2.2 Transfer Pipeline Section 2

The transfer pipeline section 2 is shown in Figure 7-8.

**Figure 7-8: Transfer Pipeline Section 2**




**Note:** Not to scale

The respective impacts of Transfer Pipeline section 2 are described in Table 7.3. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.3: Transfer Pipeline Section 2 – Transport Impacts during Construction**

| Section | Delegation | Impacts |
|---|---|---|
| **Transfer pipeline section 2** | Distance | 150 metres |
| | Approximate start and end locations | Existing Camellia pumping station (south) to the west of Rosehill Gardens Light Rail Station, Camellia NSW 2142. |
| | Public transport | The Rosehill Gardens Light Rail Station is located east of the Camellia pumping station, separated by Grand Avenue North. Construction works are not expected to impact the Rosehill Gardens Light Rail Station.<br><br>No direct impacts to public transport access are expected. |

| Section | Delegation | Impacts |
|---|---|---|
| | Active transport | There are shared paths along the southern boundary of Grand Avenue North and C15. These shared paths would be maintained during construction.<br><br>No direct impacts are expected. |
| | Crash occurrences | There are no crash occurrences near Grand Avenue.<br><br>On James Ruse Drive near C16, a total of 10 crashes were identified in this area from the most recent 5 year crash history. These incidents resulted in 8 injuries and one (1) fatality. There were 2 occurrences of RUM Code 31 (Left-rear).<br><br>In this regard, no obvious repeated patterns were found. |
| | Site compound access routes | 3 compounds would be erected in this section: C14, C15 and C16.<br><br>Vehicle access and egress routes to all 3 site compounds would be via James Ruse Drive (from either the north or the south) onto Grand Avenue or Grand Avenue North. Light vehicles exiting C15 from Grand Avenue may only make a left turn at James Ruse Drive. |
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected movements to enter the respective compounds would be 30 LV and 2 HV.<br><br>During the peak hours, there would be a total of 11 LV and 2 HV movements. This results in 11 LV and 2 HV movements accessing the respective compounds. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | Workers are expected to utilise on-street parking opportunities nearby (if available) or would be advised to use other modes of travel to go to the construction site (such as car-pooling or public transport as it is within very close walking distance of this transfer pipeline section).<br><br>HV would load and unload at the compounds as required. |
| | On-street parking opportunities | There are no on-street parking opportunities at Grand Avenue and James Ruse Drive. |
| | Impacts to on-street parking | With the erection of C14, a total of 16 car parking spaces would be temporarily lost.<br><br>It is expected that compound C14 would only be set up for a short duration to minimise the impact to nearby businesses and light rail customers that utilise these parking spaces, and that nearby business owners would be notified of these lost parking opportunities for the expected construction duration.<br><br>Notwithstanding, Sydney Water would liaise with the owners of this private car park to minimise impacts as much as practically possible. |
| | Impacts to property access | No direct impacts to property access are expected. |
| | Traffic management measures | Construction works would occur across Grand Avenue North and within the grassy, informal car parking area of the adjacent |

| Section | Delegation | Impacts |
|---|---|---|
| | | property. At Grand Avenue North, it is expected that only one (1) lane would be occupied at any given time, leaving one (1) travel lane open to the public. These works would also most likely occur during nighttime hours, to impact as little traffic as possible.<br><br>Furthermore, these construction works would be sectioned off by barriers and fences to minimise construction hazards and prioritise safety as much as practically possible. Traffic controllers would also be present on Grand Avenue to guide other respective vehicles near the worksite.<br><br>Traffic Guidance Schemes (TGS) would be prepared, prior to the commencement of construction. |
| | Potential road closures | No potential road closures are expected during these relining works. |
| | Potential detours | Customers and staff wanting to access the businesses at 175 James Ruse Drive (Lot 2/ DP1248546) can park nearby by travelling on James Ruse Drive and Grand Avenue. Although the erection of C14 impacts certain on-street parking opportunities, there are ample nearby parking opportunities for staff and customers within the other off-street car parks. |
| | Traffic impact rating (without mitigation) | Medium |

### 7.2.3 Brine Pipeline Section 1

The brine pipeline section 1 is shown in Figure 7-9.

**Figure 7-9: Brine Pipeline Section 1**


**Note:** Not to scale

The respective impacts of the brine pipeline section 1 are described in Table 7.4. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.4: Brine Pipeline Section 1 – Transport Impacts during Construction**

| Section | Delegation | Impacts |
|---|---|---|
| **Brine pipeline section 1** | Distance | 400 metres |
| | Approximate start and end locations | West of Rosehill Gardens to North of Bidgee Bidgee Light Rail Bridge, Camellia and Parramatta respectively. |
| | Public transport | No public transport services would be impacted during this section of the relining works. |
| | Active transport | There is a shared path adjacent to the light rail corridor located to the east of C12 and C13. The shared path would not be impacted by construction in this section and Sydney Water would maintain access to the shared path for pedestrians and cyclists. |
| | Crash occurrences | A total of 2 crashes were identified in this area from the most recent 5 year crash history. These were minor and resulted in 2 injuries.<br><br>No obvious repeated patterns were found. |

| Section | Delegation | Impacts |
|---|---|---|
| | Site compound access routes | Access to compound C12 would be via Grand Avenue North, with vehicles looping around to reach the site.<br><br>Vehicles accessing compound C13 would turn into the fenced road via James Ruse Drive, using a left-in and left-out approach. |
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected movements to enter the respective compounds would be 24 LV and 1 HV.<br><br>During the peak hours, there would be a total of 9 LV and 1 HV movements. This results in 9 LV and 1 HV movements accessing the respective compounds. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | Car parking may be provided within compound C12. The construction workforce would otherwise need to utilise nearby on-street car parking spaces to complete relining works in this segment.<br><br>HV would load and unload at the compounds as required. |
| | On-street parking opportunities | The construction workforce is not expected to utilise on-street parking opportunities whilst the construction works is happening. |
| | Impacts to on-street parking | No on-street parking opportunities would be lost because of the relining works. |
| | Impacts to property access | No impacts to property access are expected. |
| | Traffic management measures | Relining works would not occur on any public roads. Notwithstanding, traffic controllers would be present to help guide pedestrians and cyclists to other footpaths as required. Respective signage would also be erected near these construction works to guide the pedestrians and cyclists ahead of the construction works.<br><br>TGS would be prepared, prior to the commencement of construction. |
| | Potential road closures | No potential road closures are expected during these relining works. |
| | Potential detours | Not applicable |
| | Traffic impact rating (without mitigation) | Low |

### 7.2.4 Brine Pipeline Section 2

The brine pipeline section 2 is shown in Figure 7-10.

**Figure 7-10: Brine Pipeline Section 2**


**Note:** Not to scale

The respective impacts of brine pipeline section 2 are described in Table 7.5. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.5: Brine Pipeline Section 2 – Transport Impacts during Construction**

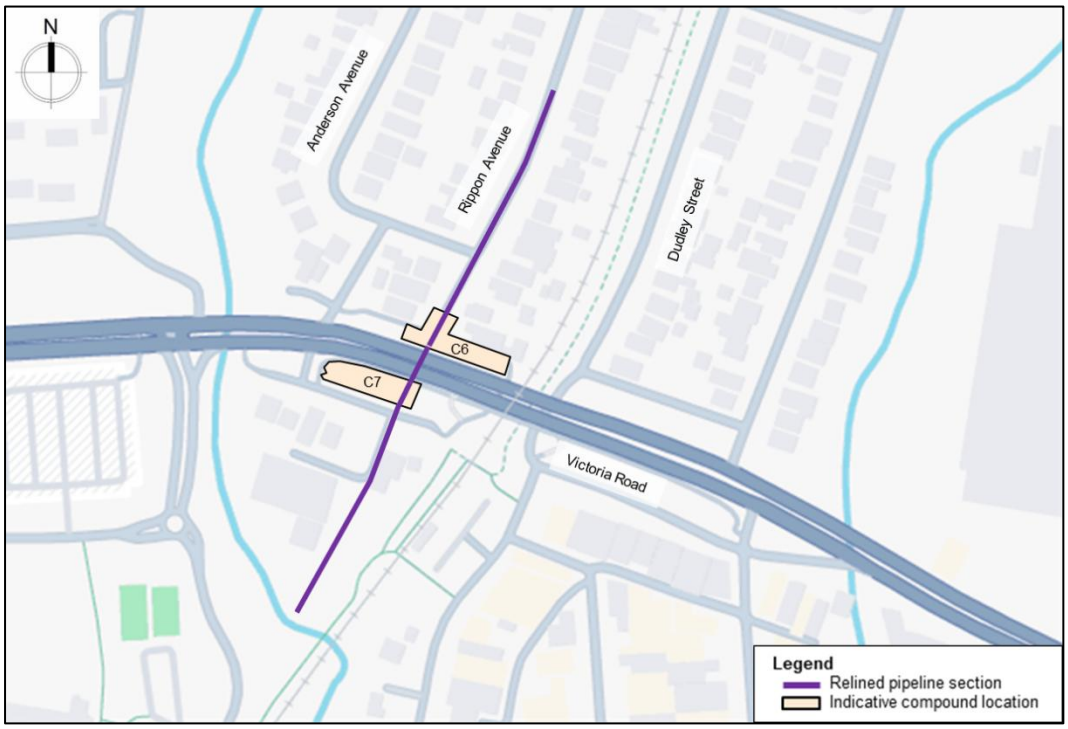
| Section | Delegation | Impacts |
|---|---|---|
| **Brine pipeline section 2** | Distance | 450 metres |
| | Approximate start and end locations | North of Camellia Light Rail Bridge to Vineyard Creek, Parramatta. |
| | Public transport | No public transport infrastructure would be impacted during this section of the relining works. |
| | Active transport | A shared path follows the light rail alignment to the east of C8 to C11. Sydney Water would not impact this route during construction.<br><br>Another shared path that forms part of the Parramatta River Walk is located to the south of C11, within Western Sydney University. This would be temporarily closed (if required) while C11 is being used by the project. Pedestrians and cyclists would be detoured around the compound and closure area using alternative routes within the Western Sydney University Campus. Detours would be agreed in consultation with Western Sydney University. |
| | Crash occurrences | There are no crashes recorded in this area. |
| | Site compound access routes | All site compounds within this section are accessed via Victoria Road, turning into Railway Street. Vehicles exiting the site compounds would use the roundabout on Railway Street to make a full turn and exit back onto Victoria Road. |

| Section | Delegation | Impacts |
|---|---|---|
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected numbers to enter the respective compounds would be 24 LV and 1 HV.<br><br>During the peak hours, there would be a total of 9 LV and 1 HV movements. This results in 9 LV and 1 HV movements accessing the respective compounds. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | No expected car parking would be provided. The construction workforce would need to utilise nearby on-street car parking spaces to complete relining works in this segment.<br><br>HV would load and unload at compounds as required. |
| | On-street parking opportunities | On-street parking is limited at Railway Street due to the one-way road layout. Workers may use on street parking on Brodie Street which is a short walk from the proposed construction compounds. |
| | Impacts to on-street parking | It is noted that approximately 35 to 38 car parking spaces would be lost due to the erection of compound C10. Students at the WSU - PC would need to find other parking opportunities temporarily whilst the relining works are taking place. Relining works would only occur for a temporary duration (approximately 1-2 months) at this pipeline section.<br><br>The construction workforce is also expected to utilise approximately 25 on-street parking spaces for parking for a temporary duration. It is expected that for relining works at this location, Sydney Water would liaise with WSU – PC whilst undertaking these works to minimise impacts. |
| | Impacts to property access | No direct impacts to property access are expected.<br><br>One (1) lane at Railway Street would always be open for travel to the public. |
| | Traffic management measures | Relining works would partially travel underneath Railway Street. Where possible, Sydney Water would carry out relining works from the existing maintenance hole. Additional access points along the existing rising main alignment may be required. These pits would be located in carparks and grassed areas to avoid full road closures.<br><br>TGS would be prepared, prior to the commencement of construction. |
| | Potential road closures | Railway Street would be partially closed during this phase of the construction works. |
| | Potential detours | One (1) lane at Railway Street would always be open for travel to the public.<br><br>Students, however, can also travel on Railway Street and Fifth Street to find on-street parking opportunities at the WSU – PC. |
| | Traffic impact rating (without mitigation) | Medium |

### 7.2.5 Brine Pipeline Section 3

The brine pipeline section 3 is shown in Figure 7-11.

**Figure 7-11: Brine Pipeline Section 3**




**Note:** Not to scale

The respective impacts of the brine pipeline section 3 are described in Table 7.6. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.6: Brine Pipeline Section 3 – Transport Impacts during Construction**

| Section | Delegation | Impacts |
|---|---|---|
| **Brine pipeline section 3** | Distance | 340 metres |
| | Approximate start and end locations | Vineyard Creek to 20 Rippon Avenue, Dundas. |
| | Public transport | This section of the proposed works is trenchless and would not have any impacts to public transport. |
| | Active transport | This section of the proposed works is trenchless and would not have any impacts to active transport. |
| | Crash occurrences | A total of 5 crashes were recorded in this area from the most recent 5 year crash history. These incidents resulted in 6 injuries and no fatalities.<br><br>A recurring trend was identified, with 80% of the crashes along this stretch of Victoria Road involving rear-end collisions, classified under RUM code 30. Extra caution is advised during construction as 20% of these crashes occurred during night hours.<br><br>Traffic management measures such as traffic controllers would be present to guide both construction and public traffic as required during construction works on Victoria Road. |

| Section | Delegation | Impacts |
|---|---|---|
| | | |
| | Site compound access routes | 2 compounds would be erected in this section: C6 and C7.<br><br>For compound C7 (south of Victoria Road), access is available via a left turn onto Victoria Road Service Road or directly from Victoria Road for westbound vehicles.<br><br>For compound C6 (north of Victoria Road), construction vehicles would travel along Victoria Road and then turn onto Anderson Avenue. Construction vehicles would then head onto Rippon Avenue to access this compound. |
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected numbers to enter the respective compounds would be 24 LV and 1 HV.<br><br>During the peak hours, there would be a total of 9 LV and 1 HV movements. This results in 9 LV and 1 HV movements accessing the respective compounds. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | Car parking may be provided within compound C7. The construction workforce would otherwise need to utilise nearby on-street parking opportunities to complete relining works in this segment.<br><br>HV would load and unload at compounds as required. |
| | On-street parking opportunities | Construction workers are expected to utilise 5-10 on-street parking opportunities on Victoria Road Service Road, Rippon Avenue or Andersen Avenue. |
| | Impacts to on-street parking | On-street parking opportunities to the east of the Wesley Employment Services David Morgan Centre may be impacted temporarily due to the proposed construction works. Approximately 5 to 10 on-street parking opportunities would be impacted.<br><br>Staff and customers may be able to utilise on-street parking opportunities on the Victoria Road Service Road, if required.<br><br>Certain on-street parking opportunities (approximately 5-10) would be temporarily unavailable on Rippon Avenue due to the proposed relining works. Notably, the relining works at this section would be temporary and would only last 1 to 2 months. |
| | Impacts to property access | Compound C6 would be located partially in the road of Rippon Avenue, Dundas. Reduced accessibility may be experienced by residents adjacent to required excavations. Sydney Water would be consulted with prior to works commencing to ensure concerns are addressed beforehand and impacts are minimised. Generally, the road in Rippon Avenue is not expected to be disturbed. However, additional access points along the existing rising main alignment may be required to support tunnelling works. |
| | Traffic management measures | Traffic controllers would be present on Rippon Avenue to guide other respective vehicles near the compounds for safety purposes. Residents along Rippon Avenue would be notified in advance if accessibility is limited during construction.<br><br>TGS would be prepared, prior to commencement of construction. |
| | Potential road closures | The southern area of Rippon Avenue would be partially closed during this phase of the relining works for compound C6. |
| | Potential detours | Not applicable |

| Section | Delegation | Impacts |
|---|---|---|
| | Traffic impact rating (without mitigation) | Medium |

## 7.2.6 Brine Pipeline Section 4

The brine pipeline section 4 is shown in Figure 7-12.

**Figure 7-12: Brine Pipeline Section 4**


**Note:** Not to scale

The respective impacts of the brine pipeline section 4 are described in Table 7.7. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.7: Brine Pipeline Section 4 – Transport Impacts during Construction**

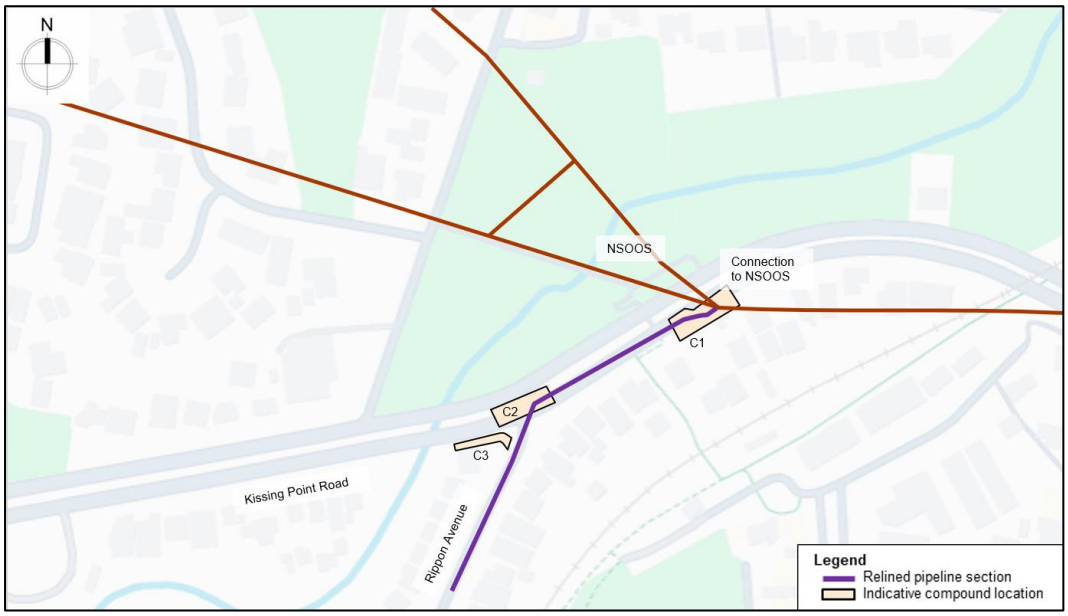
| Section | Delegation | Impacts |
|---|---|---|
| **Brine pipeline section 4** | Distance | 380 metres |
| | Approximate start and end locations | 20 Rippon Avenue to 76 Rippon Avenue, Dundas. |
| | Public transport | No public transport infrastructure would be impacted during this section of the relining works. |
| | Active transport | Temporary disruptions may occur on the footpaths along Rippon Avenue. Pedestrians would be advised to use other footpaths (and areas) by traffic controllers (if and when required).<br><br>At compound C5, a shared user path connects to Dudley Street, providing access to Yallamundi and Dundas Light Rail Stations. This shared path, however, would remain open to the public whilst the relining works are happening (with traffic controllers guiding pedestrians and cyclists as required). |
| | Crash occurrences | One (1) crash was recorded in this area from the most recent 5 year crash history, involving 2 injuries resulting from a vehicle emerging from a driveway. This incident was classified as a serious injury under RUM code 47.<br><br>No repeated crash patterns were identified. |
| | Site compound access routes | 2 compounds would be erected in this section: C4 and C5.<br><br>Access to site compounds C5 and C4 is via Victoria Road from the south and Kissing Point Road from the north. As works are staged, vehicles may use Anderson Avenue to access C4 and Rippon Avenue to access C5. |
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected numbers to enter the respective compounds would be 24 LV and 1 HV.<br><br>During the peak hours, there would be a total of 9 LV and 1 HV movements. This results in 9 LV and 1 HV movements accessing the respective compounds. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | The construction workforce is expected to utillise on-street parking opportunities at Rippon Avenue and Andersen Avenue to complete relining works.<br><br>HV would load and unload at compounds as required. |
| | On-street parking opportunities | On-street parking opportunities are available on Rippon Avenue and Anderson Avenue.<br><br>Construction workers would try to utilise on-street parking opportunities (approximately 20 to 25 spaces) whilst residents are away at work (between 9:00 am to 5:00 pm) to not impact on-street parking opportunities when residents arrive back home. |
| | Impacts to on-street parking | On-street parking opportunities at Rippon Avenue and Anderson Avenue would be temporarily lost during the relining works.<br><br>Notably, these relining works would occur for a short duration (approximately 1 to 2 months) at this pipeline section. |

| Section | Delegation | Impacts |
|---|---|---|
| | Impacts to property access | The following driveways at these residential properties would potentially be impacted:<br>• 21 to 59 Rippon Avenue, Dundas<br>• 22 to 76 Rippon Avenue, Dundas<br>• 61 to 69 Rippon Avenue, Dundas<br><br>Notably, these works would occur progressively so that most of these properties would not be impacted at the same time. Furthermore, these relining works would occur for a short duration of time (approximately 1 to 2 months) and construction workers would be advised not to impede driveways at these locations. Furthermore, at least one (1) travel lane would always be open at Rippon Avenue to the public so that the residents are impacted minimally. |
| | Traffic management measures | Construction works would occur on Rippon Avenue. This section would be cordoned off by barriers and fences to minimise construction hazards and prioritise safety as much as practically possible. Traffic controllers would also be present on Rippon Avenue to guide other respective vehicles near the worksite and ensure pedestrian safety especially for those accessing nearby light rail stations. Furthermore, residents along Rippon Avenue and Anderson Avenue would be notified in advance if driveway access is limited during construction.<br><br>TGS would be prepared, prior to the commencement of construction. |
| | Potential road closures | Rippon Avenue and Anderson Avenue would be partially closed during this phase of the construction works.<br><br>However, at least one (1) lane on both Rippon Avenue and Anderson Avenue would be open to the public whilst the relining works are happening. |
| | Potential detours | Not applicable |
| | Traffic impact rating (without mitigation) | Medium |

### 7.2.7 Brine Pipeline Section 5

The brine pipeline section 5 is shown in Figure 7-13.

**Figure 7-13: Brine Pipeline Section 5**




**Note:** Not to scale

The respective impacts for the brine pipeline section 5 are described in Table 7.8. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.8: Brine Pipeline Section 5 – Transport Impacts during Construction**

| Section | Delegation | Impacts |
|---|---|---|
| **Brine pipeline section 5** | Distance | 230 metres |
| | Approximate start and end locations | 76 Rippon Avenue to 59 Kissing Point Road, Dundas. |
| | Public transport | The following bus stops would be impacted by the construction works:<br>• Kissing Point Rd before Rippon Ave<br><br>These bus stops would be impacted as the construction works would take place on Kissing Point Road.<br><br>Whilst the relining works are occurring at these bus stop locations, it is recommended that the bus stop locations be moved 50 metres northeast until the construction works have been completed. These bus stops can then be relocated back to the original location.<br><br>These bus stops cater for the following bus routes:<br>• Route 545.<br><br>Notwithstanding, construction works along Kissing Point Road are expected to occur at night. |

| Section | Delegation | Impacts |
|---|---|---|
| | Active transport | There are no shared paths along Rippon Avenue. There is one (1) shared path that connects Kissing Point Road to the Dundas Light Rail stop. However, the construction works would occur outside of this shared path area and thus, the active transport infrastructure would not be impacted by the construction works.<br><br>Traffic controllers and signage would still be present as traffic management measures to guide pedestrians and cyclists to make the respective detours (if and when required).<br><br>Notably, the relining works at Kissing Point Road would only occur during nighttime hours to impact as little traffic as practically possible. |
| | Crash occurrences | A total of 3 crashes were recorded in this area from the most recent 5 year crash history, resulting in 3 moderate injuries.<br><br>2 incidents were classified under RUM code 71 and one (1) under RUM code 48, involving off-road collisions with objects from the footpath.<br><br>No repeated crash patterns were identified. |
| | Site compound access routes | 3 compounds would be erected in this section: C1, C2 and C3. Access to site compounds C1, C2 and C3 is via Kissing Point Road, entering from the east and travelling westbound. Additionally, compound C3 can also be accessed via a left turn from Rippon Avenue.<br><br>It is noted that C1 and C2 would only be erected during nighttime hours to minimise traffic impacts as much as practically possible. |
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected numbers to enter the respective compounds would be 24 LV and 1 HV.<br><br>During the nighttime hours, there would be a total of 9 LV and 1 HV movements. This results in 9 LV and 1 HV movements accessing the respective compounds. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | The construction workforce is expected to utilise on-street parking opportunities at Rippon Avenue and Andersen Avenue to complete construction works, during the nighttime period.<br><br>HV would load and unload at compounds as required. |
| | On-street parking opportunities | There are no on-street parking opportunities along Kissing Point Road.<br><br>Depending on the timing and stage of construction, there may be on-street parking opportunities on Rippon Avenue and Anderson Avenue which the construction workforce would utilise during the nighttime relining works. |
| | Impacts to on-street parking | Some on-street parking opportunities at Rippon Avenue and Anderson Avenue would be temporarily lost during the relining works.<br><br>Notably, these relining works would occur for a short duration (approximately 1 to 2 months) at night for this pipeline section. |

| Section | Delegation | Impacts |
|---|---|---|
| | Impacts to property access | The following driveways at these residential properties would potentially be impacted:<br>• 69 to 77 Rippon Avenue, Dundas<br>• 78 to 88 Rippon Avenue, Dundas<br>• 43 to 59 Kissing Point Road, Dundas<br><br>Notably, these works would occur progressively so that most of these properties would not be impacted at the same time. These relining works would occur for a short duration of time (approximately 1 to 2 months) and construction workers would be advised not to impede driveways at these locations.<br><br>Furthermore, at least one (1) travel lane would always be open at Rippon Avenue to the public so that the residents are impacted minimally. At least 2 eastbound travel lanes would always be open at Kissing Point Road to ensure the public can still travel on this road, even during nighttime relining works. |
| | Traffic management measures | Relining works would occur on Rippon Avenue and at Kissing Point Road.<br><br>Residents along Rippon Avenue would be notified in advance if driveway access is temporarily restricted during construction.<br><br>As Kissing Point Road is a state road, most construction works are proposed to occur at night with appropriate traffic control measures in place. It is noted that 2 eastbound lanes would always be unobstructed even during nighttime works. This would ensure there are no traffic disruptions occurring at any time. Traffic management measures would be in place to ensure there are minimal construction impacts at Kissing Point Road. For example, the construction works on Kissing Point Road would be cordoned off by barriers and fences to minimise construction hazards and prioritise safety as much as practically possible. Traffic controllers would also be present on Kissing Point Road to guide other respective vehicles near the worksite and ensure pedestrian safety especially for those accessing nearby light rail stations.<br><br>TGS would be prepared, prior to the commencement of construction. |
| | Potential road closures | Rippon Avenue and Kissing Point Road would be partially closed during this phase of the relining works.<br><br>However, at least one (1) lane on Rippon Avenue would be open to the public whilst the construction works are happening. 2 eastbound lanes on Kissing Point Road would always be unobstructed for the public, even during nighttime relining works. |
| | Potential detours | Not applicable |
| | Traffic impact rating (without mitigation) | High |

## 7.3 River Release Pipelines

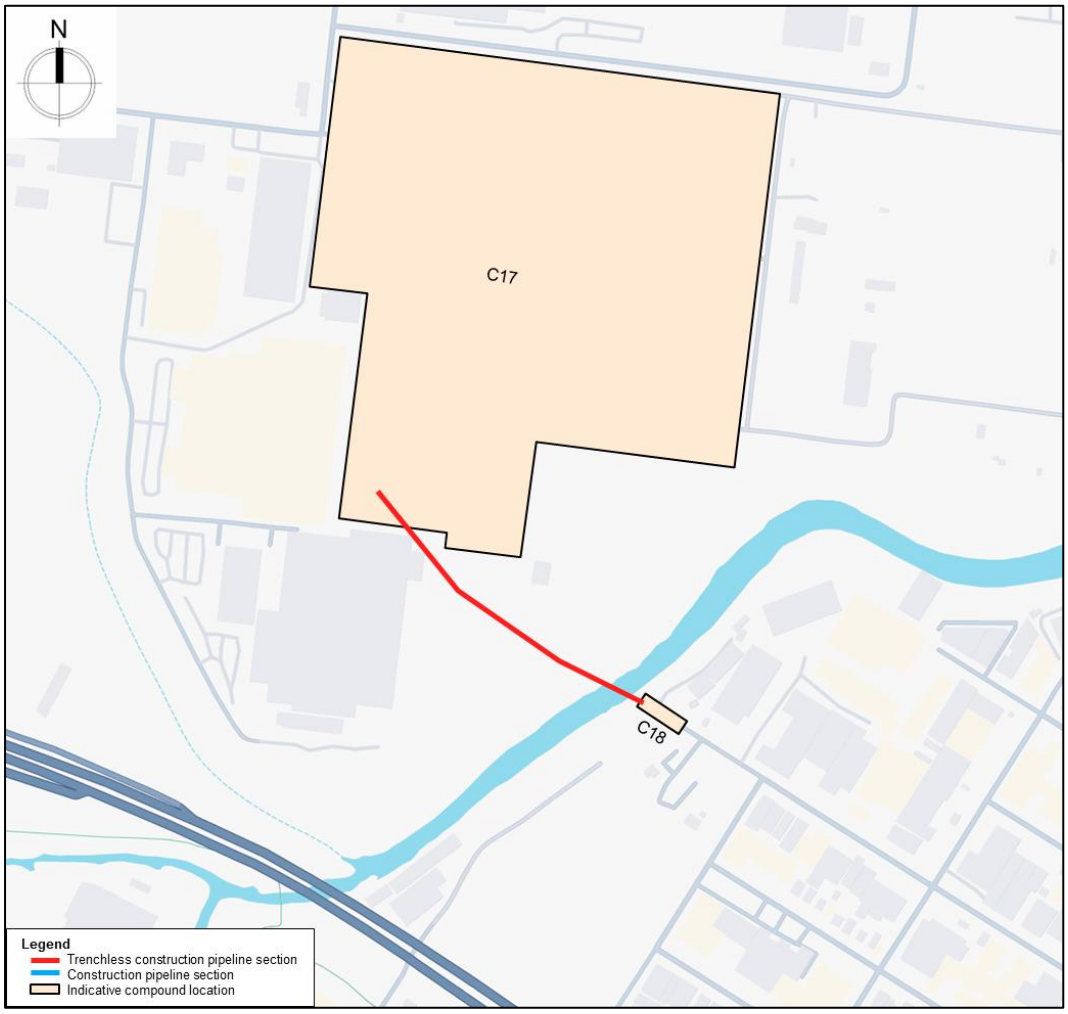
The assessment of the impacts associated with the construction of the river release pipeline has been carried out for nine different sections, which are outlined within Sections 7.3.1 to 7.3.9.

Construction impacts including impacts to public transport, active transport, compound activities such as light and heavy vehicle access points and numbers have been described for each pipeline in the respective sections below. Open trench construction would progress at a rate of about 10 to 25 metres per day and have a duration of between eight to ten weeks in any given area. The assessment of impacts in the following sections considers the worst-case impacts during construction. Due to the progressive nature of the trenching works, it is unlikely that all receivers within the following sections would be impacted at the same time.

### 7.3.1 River Release Pipeline 1

The river release pipeline section 1 is shown in Figure 7-14.

**Figure 7-14: River Release Pipeline Section 1**




**Note:** Not to scale

Trenchless construction works are expected to occur at this section. In this regard, low traffic impacts are expected within this section of the river release pipeline during construction.

### 7.3.2 River Release Pipeline Section 2

The river release pipeline section 2 is shown in Figure 7-15.

**Figure 7-15: River Release Pipeline Section 2**


**Note:** Not to scale

The respective impacts of river release pipeline section 2 are described in Table 7.9. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.9: River Release Pipeline Section 2 – Transport Impacts during Construction**

| Section | Delegation | Impacts |
|---|---|---|
| **River release pipeline section 2** | Distance | 1 kilometre |
| | Approximate start and end locations | 113 Carnarvon Street, Silverwater to 2-16 Salisbury Street, Silverwater. |
| | Public transport | The following bus stops would be impacted by the construction works:<br>• Carnarvon St after Stubbs St<br>• Carnarvon St at Vore St.<br><br>These bus stops would be impacted as the construction works would take place on Carnarvon Street.<br><br>Following consultation with the community, Sydney Water is proposing to undertake construction works on this segment at night. Notwithstanding, it is still recommended that the bus stop locations be moved 80 to 100 metres southeast for the Carnarvon St after Stubbs St bus stop, and 80 to 100 metres northwest for the Carnarvon St at Vore St bus stop until the construction works have been completed, subject to liaison with the bus operators and TfNSW. After the works are completed, these bus stops can then be relocated back to the original location.<br><br>These bus stops cater for the following bus routes:<br>• Route 540<br>• Route 544.<br><br>The construction works can also be staged so that both bus stops on Carnarvon Street are not inaccessible at the same time. In this regard, bus access would always be available to the public. |
| | Active transport | Pedestrians and cyclists using the footpaths on either side of Carnarvon Street would be asked to detour as required by traffic controllers, signage and barriers.<br><br>Notably, these construction works are being completed at night to minimise impacts. |
| | Crash occurrences | A total of 3 crashes were recorded in this area from the most recent 5 year crash history. All of them had different RUM codes (10, 19 and 21). A total of 3 people were injured in these crashes.<br><br>No repeated patterns were found for these crashes. |
| | Site compound access routes | 4 different compounds may be erected in this section: C18, C22, C23 and C24.<br><br>C18 would be accessed via Carnarvon Street. C22 and C23 would be accessed via Blight Street. C24 would be accessed via Beaconsfield Street.<br><br>Vehicles would access these compounds by travelling on Parramatta Road, turning onto Silverwater Road and then heading onto the respective streets to get to the compounds. |

| Section | Delegation | Impacts |
|---|---|---|
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected numbers to enter the respective compounds would be 15 LV and 20 HV.<br><br>There would be a total of 6 LV and 3 HV. This results in 6 LV and 3 HV movements accessing the respective compounds. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | The construction workforce is expected to utilise on-street parking opportunities nearby.<br><br>HV would load and unload at compounds as required. |
| | On-street parking opportunities | There are on-street parking opportunities on both sides of Carnarvon Street. |
| | Impacts to on-street parking | It is noted that approximately 15 to 17 spaces would be lost due to the erection of compound C18. Staff and customers wanting to access the businesses at 107 Carnarvon Street would need to access the off-street car parking for these businesses through the access at Derby Street.<br><br>Approximately 50 on-street parking opportunities would be temporarily unavailable due to the construction works occurring on one side of Carnarvon Street.<br><br>Notably, these construction works would only occur temporarily for a short duration of time (1 to 2 months) during the night. In this regard, impacts to nearby on-street parking opportunities would be minimal. |
| | Impacts to property access | The following driveways at these properties would potentially be impacted:<br>• 107 Carnarvon Street, Silverwater<br>• 99 to 101 Carnarvon Street, Silverwater<br>• 81-87 Carnarvon Street, Silverwater<br>• 79-91 Carnarvon Street, Silverwater<br>• 75 Carnarvon Street, Silverwater (Harvey Norman Flagship Store)<br>• 71 Carnarvon Street, Silverwater<br>• 67 Carnarvon Street, Silverwater<br>• 53-59 Carnarvon Street, Silverwater<br>• 110 to 124 Carnarvon Street, Silverwater<br>• 102 Carnarvon Street, Silverwater<br>• 96 Carnarvon Street, Silverwater<br>• 97 Carnarvon Street, Silverwater<br>• 88 Carnarvon Street, Silverwater<br>• 38-42 Stubb Street, Silverwater<br>• 44 to 86A Carnarvon Street, Silverwater<br><br>Notably, these works would occur progressively so that most of these properties would not be impacted at the same time. These construction works would occur for a short duration of time (approximately 1 to 2 months) at night and construction workers would be advised not to impede driveways at these locations. Business staff and customers would continue to be consulted about the construction works.<br><br>Furthermore, at least one (1) travel lane would always be open at Carnarvon Street to the public so that the business staff and residents are impacted minimally. |

| Section | Delegation | Impacts |
|---|---|---|
| | | Sydney Water has commenced consultation with these residences and businesses during preparation of the EIS. Night works have been earmarked in this location as a result due to concerns about accessibility. |
| | Traffic management measures | Construction works would occur on Carnarvon Street.<br><br>Residents and businesses along Carnarvon Street would be notified in advance if their driveway access is temporarily restricted during construction.<br><br>Parts of the Carnarvon Street travel lane would be sectioned off by barriers and fences to minimise construction hazards and prioritise safety as much as practically possible. Traffic controllers would also be present on Carnarvon Street to guide other respective public vehicles near the worksite.<br><br>TGS would be prepared, prior to the commencement of construction. |
| | Potential road closures | Carnarvon Street would be partially closed at night during this phase of the construction works.<br><br>However, at least one (1) lane on Carnarvon Street would be open to the public whilst the construction works are happening. |
| | Potential detours | Business staff, customers and certain residents can take detours to access their required destinations. Detour routes would include utilising streets such as Derby Street/ Stubbs Street/ Skaratt Street North. |
| | Traffic impact rating (without mitigation) | Medium |

### 7.3.3 River Release Pipeline Section 3

The river release pipeline section 3 is shown in Figure 7-16.

**Figure 7-16: River Release Pipeline Section 3**


**Note:** Not to scale

The respective impacts of river release pipeline section 3 are described in Table 7.10. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.10: River Release Pipeline Section 3 – Transport Impacts during Construction**

| Section | Delegation | Impacts |
|---|---|---|
| **River release pipeline section 3** | Distance | 470 metres |
| | Approximate start and end locations | 2-16 Salisbury Street, Silverwater (adjacent to Carnarvon Road) to 60 Derby Street, Silverwater. |
| | Public transport | No bus stops would be impacted by the construction works. However, the following bus route would be impacted:<br>• Route 540. |
| | Active transport | Pedestrians and cyclists using the footpaths on either side of Vore Street and Derby Street would be asked to detour as required by traffic controllers, signage and barriers. |
| | Crash occurrences | There were no recorded crash statistics in this area. |
| | Site compound access routes | 2 compounds would be erected in this section: C19 and C20.<br><br>Vehicles would access these compounds by travelling on Parramatta Road, turning onto Silverwater Road and then heading onto Derby Street to enter C19 and C20. |

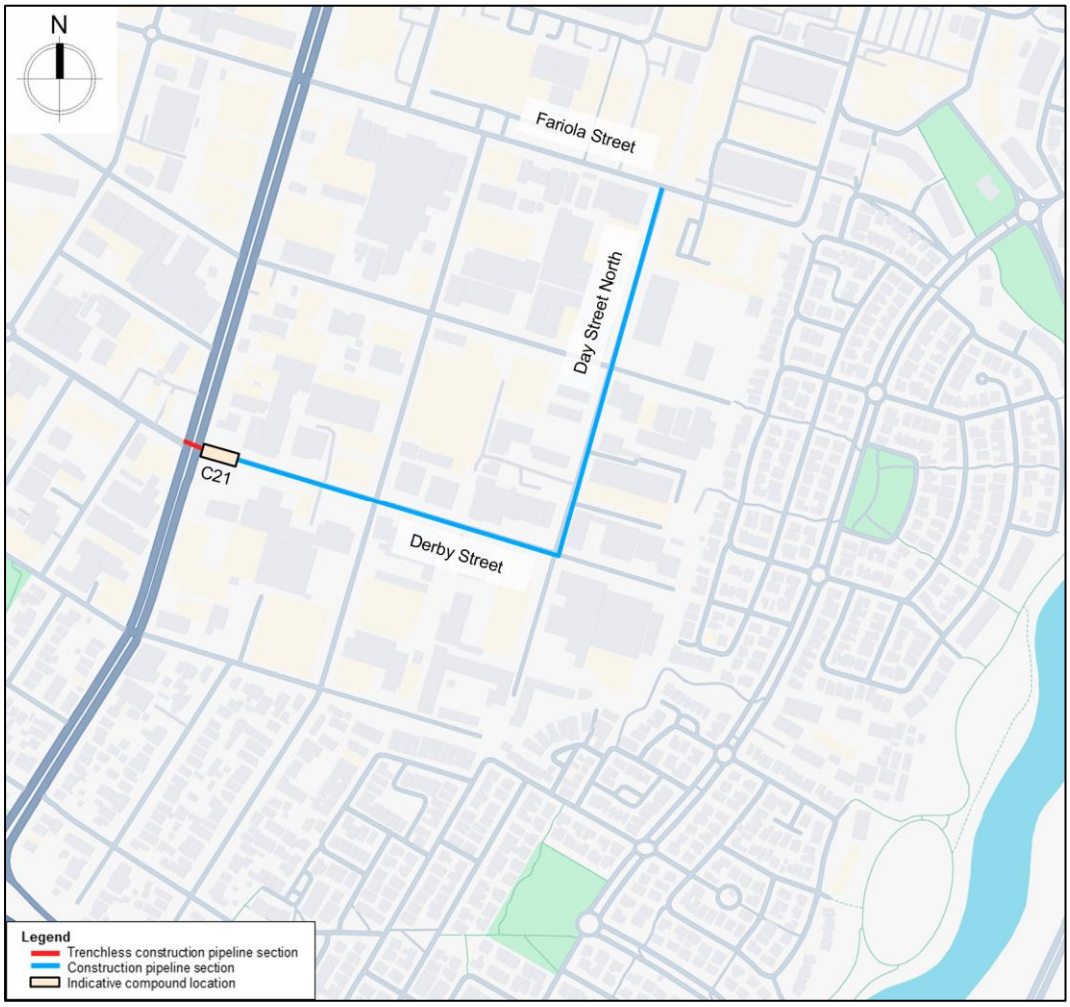
| Section | Delegation | Impacts |
|---|---|---|
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected numbers to enter the respective compounds would be 15 LV and 20 HV.<br><br>During the peak hours, there would be a total of 6 LV and 3 HV. This results in 6 LV and 3 HV movements accessing the respective compounds. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | The construction workforce is expected to utilise on-street parking opportunities nearby.<br><br>HV would load and unload at compounds as required. |
| | On-street parking opportunities | There are on-street parking opportunities on both sides of Vore Street and Derby Street. |
| | Impacts to on-street parking | It is noted that approximately 12 to 14 spaces would be lost because of the construction at Vore Street, 13 to 15 spaces would be lost as a result of the construction at Derby Street, 30 spaces would be lost due to the erection of compound C19, and 10 to 12 spaces would be lost due to the erection of compound C20.<br><br>Notably, these construction works would only occur temporarily for a short duration of time (1 to 2 months). |
| | Impacts to property access | The following driveways at these properties would potentially be impacted due to the pipeline works:<br>• 14 to 22 Vore Street, Silverwater<br>• 47 Carnarvon Street, Silverwater<br>• 1-5 Vore Street, Silverwater<br>• 7 Vore Street, Silverwater<br>• 11-13 Vore Street, Silverwater<br>• 13 to 17 Vore Street, Silverwater<br>• 21 Vore Street, Silverwater<br>• 23 Vore Street, Silverwater<br>• 29 Vore Street, Silverwater<br>• 75-77 Derby Street, Silverwater<br>• 71 Derby Street, Silverwater<br>• 67-69 Derby Street, Silverwater<br>• 60 to 66 Derby Street, Silverwater.<br><br>The following driveways at these properties would potentially be impacted due to the erection of compound C19:<br>• 22 Vore Street, Silverwater<br>• 24 Vore Street, Silverwater<br>• 74-80 Derby Street, Silverwater<br>• 9 Suttor Street, Silverwater<br>• 75 Carnarvon Street, Silverwater (Harvey Norman Flagship Store)<br>• 5 Fisher Street, Silverwater<br>• 84 to 102 Derby Street, Silverwater |

| Section | Delegation | Impacts |
|---|---|---|
| | | Notably, these works would occur progressively so that most of these properties would not be impacted at the same time.<br>These construction works would occur for a short duration of time (approximately 1 to 2 months) and construction workers would be advised not to impede driveways at these locations. Business staff and customers would be advised of these construction works and its temporary duration. During these works, staff and customers can detour towards Carnarvon Street/ Stanley Street/ Churchill Street/ Suttor Street to access the impacted businesses.<br><br>Furthermore, at least one (1) travel lane would always be open at Vore Street to the public so that the business staff and residents are impacted minimally. |
| | Traffic management measures | Construction works would occur on Vore Street and Derby Street. Furthermore, one (1) travel lane on Vore Street and Derby Street would be sectioned off by barriers and fences to minimise construction hazards and prioritise safety as much as practically possible. Traffic controllers would also be present on Vore Street and Derby Street to guide other respective vehicles near the worksite.<br><br>TGS would be prepared, prior to the commencement of construction.<br><br>Residents and businesses along Vore Street and Derby Street would be notified in advance if driveway access is temporarily restricted during construction.<br><br>C20 would only be erected during nighttime (on weekdays and weekends) to ensure the public can still access Derby Street (when required). |
| | Potential road closures | Vore Street and Derby Street would be partially closed during this phase of the construction works.<br><br>However, at least one (1) lane on Vore Street and Derby Street would be open to the public whilst the construction works are happening.<br><br>Notably, compound C20 would only be erected during nighttime (on weekdays and weekends) to ensure the public can still access Derby Street (when required). |
| | Potential detours | Business staff, customers and certain residents can take detours to access their required destinations. Detour routes would include utilising streets such as Carnarvon Street/ Stanley Street/ Churchill Street/ Suttor Street. |
| | Traffic impact rating (without mitigation) | High |

### 7.3.4 River Release Pipeline Section 4

The river release pipeline section 4 is shown in Figure 7-17.

**Figure 7-17: River Release Pipeline Section 4**




**Note:** Not to scale

The respective impacts of river release pipeline section 4 are described in Table 7.11. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.11: River Release Pipeline Section 4 – Transport Impacts during Construction**

| Section | Delegation | Impacts |
|---|---|---|
| **River release pipeline section 4** | Distance | 890 metres |
| | Approximate start and end locations | 60 Derby Street, Silverwater to 33 Fariola Street, Silverwater. |
| | Public transport | No bus stops would be impacted by the construction works. However, the following bus route would be impacted at Wetherill Street North for 1 to 2 months:<br>• Route 544. |
| | Active transport | Pedestrians and cyclists using the footpaths on either side of Derby Street and Day Street North would be asked to detour as required by traffic controllers, signage and barriers. |
| | Crash occurrences | A total of 5 crashes were recorded in this area from the most recent 5 year crash history. 2 RUM codes were identified (10 and 39). A total of 4 people were injured in these crashes.<br><br>There was a repeated pattern of RUM Code 10 (cross-traffic) crashes at the Derby Street/ Wetherill Street intersection. This occurred in 2021 and does not have a direct correlation to the construction works that would occur in this area. |
| | Site compound access routes | 1 compound would be erected in this section; C21.<br><br>Vehicles would access C21 by travelling on Parramatta Road, turning onto Silverwater Road and then heading onto Derby Street. |
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected numbers to enter the respective compounds would be 15 LV and 20 HV.<br><br>During the peak hours, there would be a total of 6 LV and 3 HV. This results in 6 LV and 3 HV movements accessing the respective compounds. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | The construction workforce is expected to utilise on-street parking opportunities nearby.<br><br>HV would load and unload at compounds as required. |
| | On-street parking opportunities | There are on-street parking opportunities on Derby Street and Day Street North. |
| | Impacts to on-street parking | It is noted that approximately 20 to 22 spaces would be lost because of the construction at Derby Street, 40 to 42 spaces would be lost due to the construction at Day Street North and 10 to 12 spaces would be lost due to the erection of compound C21.<br><br>Notably, these construction works would only occur temporarily for a short duration of time (1 to 2 months). |
| | Impacts to property access | The following driveways at these properties would potentially be impacted due to the pipeline works:<br>• 56 Derby Street, Silverwater<br>• 52 Derby Street, Silverwater<br>• 46 Derby Street, Silverwater<br>• 42 Derby Street, Silverwater<br>• 32-40 Derby Street, Silverwater<br>• 36 Derby Street, Silverwater<br>• 26 Derby Street, Silverwater<br>• 57 to 63 Derby Street, Silverwater |

| Section | Delegation | Impacts |
|---|---|---|
| | | • 37 to 47 Derby Street, Silverwater<br>• 26 to 28 Day Street North, Silverwater<br>• 26 Day Street North, Silverwater<br>• 14 Egerton Street, Silverwater<br>• 31-33 Day Street North, Silverwater<br>• 35 to 39 Day Street North, Silverwater<br>• 17 Egerton Street, Silverwater<br><br>The following driveways at these properties would potentially be impacted due to the erection of compound C21:<br>• 103-105 Silverwater Road, Silverwater<br>• 107 Silverwater Road, Silverwater<br><br>Notably, these works would occur progressively so that most of these properties would not be impacted at the same time. Furthermore, the construction works would occur for a short duration of time (approximately 1 to 2 months) and construction workers would be advised not to impede driveways at these locations. Business staff and customers would be advised of these construction works and its temporary duration. During these works, staff and customers can detour towards Egerton Street/ Wetherill Street North/ Fariola Street to access the impacted businesses.<br><br>Furthermore, at least one (1) travel lane would always be open at Derby Street/ Day Street North to the public so that the business staff and residents are impacted minimally. |
| | Traffic management measures | Construction works would occur on Derby Street and Day Street North. Furthermore, parts of Derby Street and Day Street North would be sectioned off by barriers and fences to minimise construction hazards and prioritise safety as much as practically possible. Traffic controllers would also be present on Derby Street/ Day Street North to guide other respective vehicles near the worksite.<br><br>Residents and businesses along Derby Street and Day Street North would be notified in advance if driveway access is temporarily restricted during construction.<br><br>TGS would be prepared, prior to the commencement of construction.<br><br>The public would still be able to access Derby Street (as required) as at least one (1) lane would always be open to the public. |
| | Potential road closures | Derby Street and Day Street North would be partially closed during this phase of the construction works.<br><br>However, at least one (1) lane on Derby Street and Day Street North would be open to the public whilst the construction works are happening.<br><br>Notably, compound C21 would only be erected during nighttime (on weekdays and weekends) to ensure the public can still access Derby Street (when required). |
| | Potential detours | Business staff, customers and certain residents can take detours to access their required destinations. Detour routes would include utilising streets such as Egerton Street/ Wetherill Street North/ Fariola Street. |

| Section | Delegation | Impacts |
|---|---|---|
| | Traffic impact rating (without mitigation) | High |

## 7.3.5 River Release Pipeline Section 5

The river release pipeline section 5 is shown in Figure 7-18.

**Figure 7-18: River Release Pipeline Section 5**


**Note:** Not to scale

The respective impacts of river release pipeline section 5 are described in Table 7.12. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.12: River Release Pipeline Section 5 – Transport Impacts during Construction**

| Section | Delegation | Impacts |
|---|---|---|
| **River release pipeline** | Distance | 500 metres |
| | Approximate start and end locations | 33 Fariola Street, Silverwater to 1 Nurmi Avenue, Newington |
| | Public transport | The following bus stop would be impacted by the construction works: |

| Section | Delegation | Impacts |
|---|---|---|
| **section 5** | | • Pierre de Coubertin Park, Newington Bvd.<br><br>This bus stop would be impacted as the construction works would take place on Newington Boulevard.<br><br>Whilst the construction works are occurring at this location, it is recommended that the bus stop be moved 80 metres to 100 metres southwest for the Pierre de Coubertin Park bus stop until the construction works have been completed. The bus stop can then be relocated back to the original location.<br><br>The bus stop caters for the following bus routes:<br>• Route 525<br>• Route 526. |
| | Active transport | Shared paths are located to the south of C25 and C26.<br><br>Pedestrians and cyclists would be detoured to other footpaths (and areas) through signage and traffic controllers. In order to access the Sydney Olympic Park Area, cyclists and pedestrians would be advised to use the footpaths on Avenue of Europe, Avenue of Oceania and Hill Road temporarily whilst construction works are completed.<br><br>Even though the compounds would have fences and barriers, pedestrians/ cyclists would still be advised to cycle and walk around the compounds. |
| | Crash occurrences | No crash records were identified for this area. |
| | Site compound access routes | 2 compounds would be erected in this section: C25 and C26.<br><br>Vehicles would access C25 and C26 by travelling on Parramatta Road/ Great Western Highway, turning onto Hill Road and then heading onto Avenue of Oceania. Vehicles would then turn onto Newington Boulevard to access C25 and C26. |
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected numbers to enter the respective compounds would be 15 LV and 20 HV.<br><br>During the peak hours, there would be a total of 6 LV and 3 HV. This results in 6 LV and 3 HV movements accessing the respective compounds. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | The construction workforce is expected to utilise on-street parking opportunities nearby.<br><br>HV would load and unload at compounds as required. |
| | On-street parking opportunities | There are on-street parking opportunities on both sides of Fariola Street, alternate sides on Comaneci Avenue and both sides of Newington Boulevard. |
| | Impacts to on-street parking | It is noted that approximately 10 spaces would be lost because of the construction at Fariola Street, 10 spaces would be lost due to the construction at Comaneci Avenue and 5 to 6 spaces would be lost as a result of construction at Newington Boulevard.<br><br>Notably, these construction works would only occur temporarily for a short duration of time (1 to 2 months). |

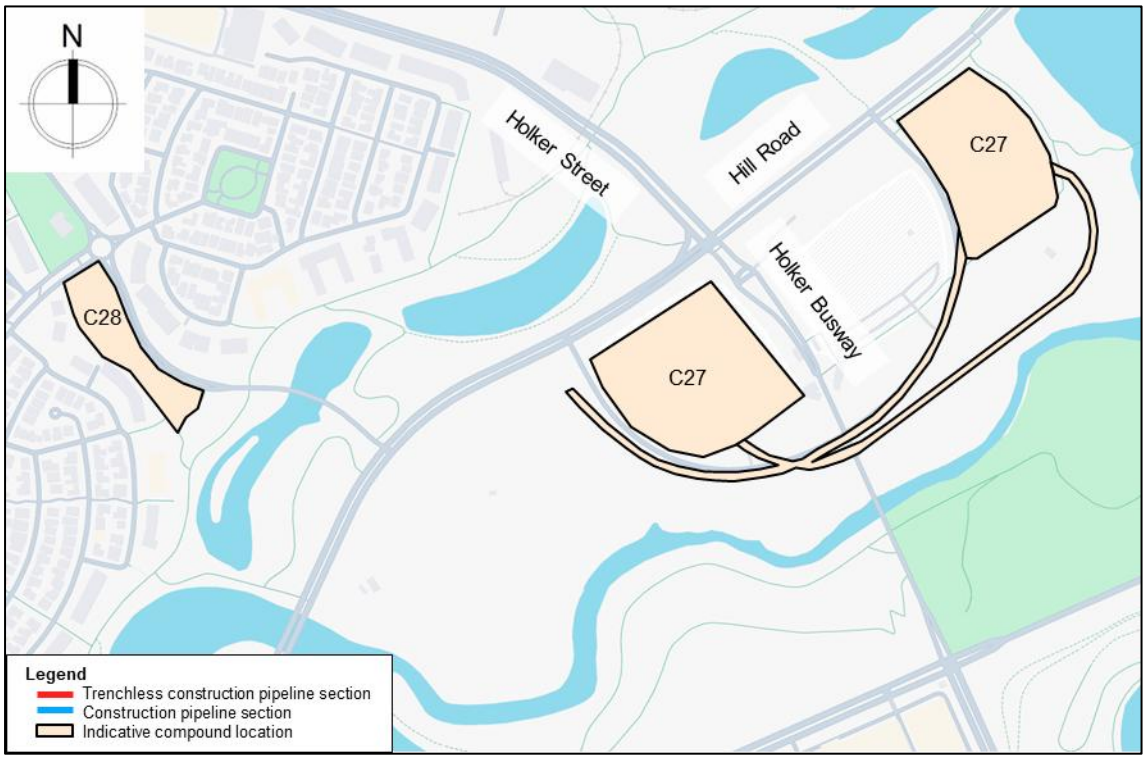
| Section | Delegation | Impacts |
|---|---|---|
| | | The construction workforce is not expected to utilise these parking opportunities whilst construction work is happening. |
| | Impacts to property access | The following driveways at these properties would potentially be impacted due to the pipeline works:<br>• 2 to 12 Comaneci Avenue, Newington<br>• 20 Comaneci Avenue, Newington<br>• 1 to 11 Comaneci Avenue, Newington<br>• 17 Mockridge Avenue, Newington<br>• 6 Newington Boulevard, Newington<br>• 4 Newington Boulevard, Newington<br><br>Notably, these works would occur progressively so that most of these properties would not be impacted at the same time. These construction works would occur for a short duration of time (approximately 1 to 2 months) and construction workers would be advised not to impede driveways at these locations. Residents would be advised of these construction works and its temporary duration. During these works, residents can utilise on-street parking opportunities at Mockridge Avenue, Watt Avenue and Clarke Street. |
| | Traffic management measures | Construction works would occur on Fariola Street, Comaneci Avenue and the northbound lanes at Newington Boulevard.<br><br>Whilst this is occurring, vehicles would need to make temporary detours at Newington Boulevard, Nurumi Avenue, Kosmala Close and Wenden Avenue to continue travelling northbound and southbound. Vehicles can also travel on Louis Avenue and head onto Clarke Street to park near their respective houses.<br><br>Notwithstanding, the travel lanes would be sectioned off by barriers and fences to minimise construction hazards and prioritise safety as much as practically possible. Traffic controllers would also be present on Fariola Street/ Comaneci Avenue/ Newington Boulevard/ Mockridge Avenue to guide other respective vehicles near the worksite.<br><br>Residents and businesses along Fariola Street, Comaneci Avenue and Newington Boulevard would be notified in advance if driveway access is temporarily restricted during construction.<br><br>TGS would be prepared, prior to the commencement of construction. |
| | Potential road closures | Fariola Street would be partially closed during this phase of the construction works. However, at least one (1) lane on Fariola Street would be open to the public whilst the construction works are happening.<br><br>Comaneci Avenue and the northbound lanes on Newington Boulevard would be temporarily closed during construction works. Residents would be advised to take detours to park near their respective houses or access their homes. These routes are detailed below. |
| | Potential detours | Certain residents would need to make detours at Newington Boulevard, Nurumi Avenue, Kosmala Close and Wenden Avenue to continue travelling northbound and southbound. Vehicles can also travel on Louis Avenue and head onto Clarke Street to park near their respective houses. |

| Section | Delegation | Impacts |
|---|---|---|
| | | Traffic controllers would be present to guide vehicles towards these detour routes whilst the temporary construction works are happening. |
| | Traffic impact rating (without mitigation) | Medium |

## 7.3.6 River Release Pipeline Section 6

The river release pipeline section 6 is shown in Figure 7-19.

**Figure 7-19: River Release Pipeline Section 6**




**Note:** Not to scale

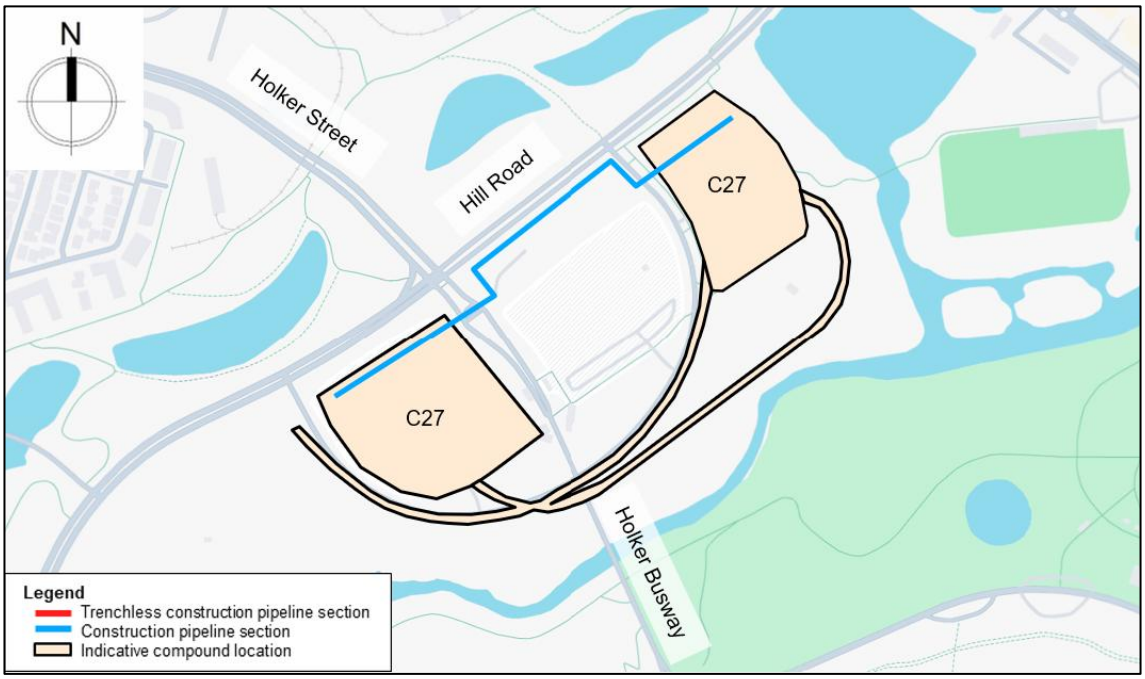
Trenchless construction works are expected to occur at this section. In this regard, low traffic impacts are expected within this section of the river release pipeline during construction.

Impacts for compounds C26 and C27 are addressed in Sections 7.3.5 and 7.3.7.

## 7.3.7 River Release Pipeline Section 7

The river release pipeline section 7 is shown in Figure 7-20.

**Figure 7-20: River Release Pipeline Section 7**




**Note:** Not to scale

The respective impacts for the river release pipeline section 7 are described in Table 7.13. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.13: River Release Pipeline Section 7 – Transport Impacts during Construction**

| Section | Delegation | Impacts |
|---|---|---|
| **River release pipeline section 7** | Distance | 630 metres |
| | Approximate start and end locations | Around URBNSURF Sydney – 15 Hill Road, Sydney Olympic Park. |
| | Public transport | No bus stops would be impacted by the construction works. However, the following bus route would be impacted at Holker Busway for 4-6 months:<br>• Route 533. |
| | Active transport | Shared paths are located to the north of C27.<br><br>Whilst the construction works are happening, the shared paths on the southern side of Hill Road would be cordoned off during the construction works. Pedestrians and cyclists would be detoured to other footpaths (like the footpaths located to the north of Hill Road) through signage and traffic controllers.<br><br>Even though the compounds would have fences and barriers, pedestrians and cyclists would still be advised to cycle and walk around the compound. |

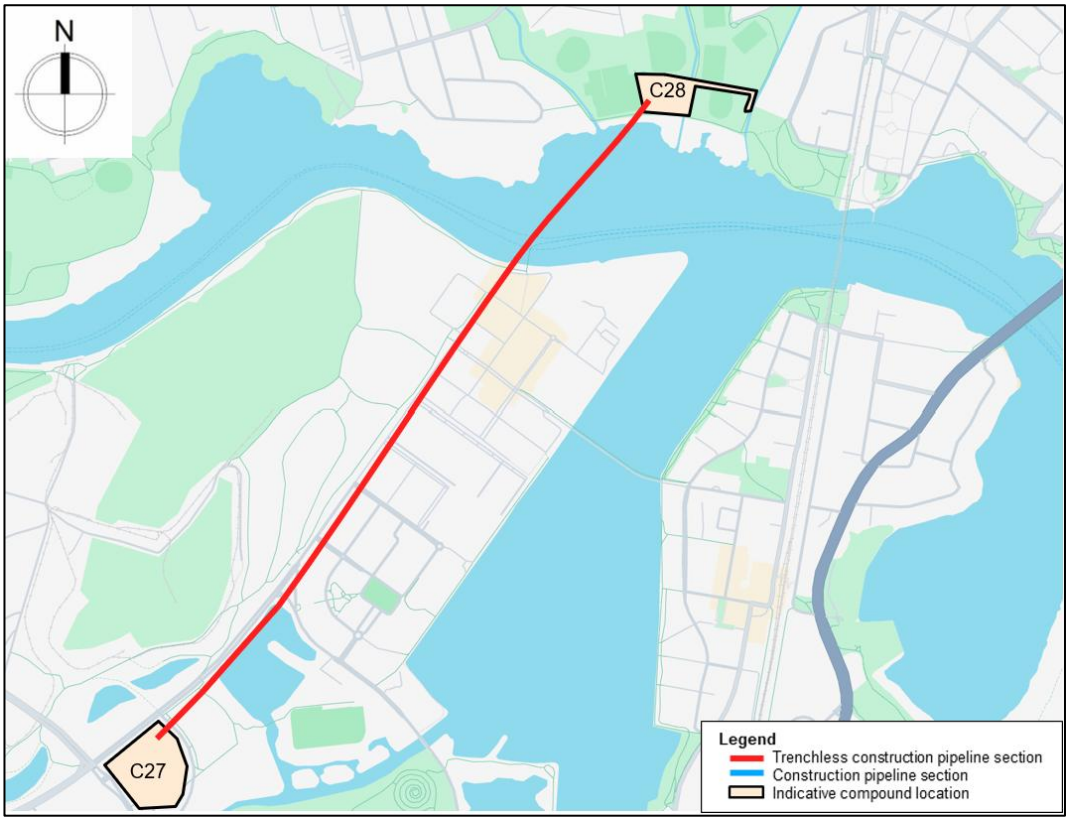
| Section | Delegation | Impacts |
|---|---|---|
| | Crash occurrences | One (1) crash was recorded in this area from the most recent 5yr crash history. It was a rear end (RUM code 30), and one (1) person was injured.<br><br>This crash does not have a direct correlation to the construction works that are occurring. |
| | Site compound access routes | One (1) compound would be erected in this section; C27.<br><br>Vehicles would access C27 by travelling on Parramatta Road/ Great Western Highway, turning onto Hill Road and then heading onto Holker Busway. |
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected numbers to enter the compound would be 15 LV and 20 HV.<br><br>During the peak hours, there would be a total of 6 LV and 3 HV. This results in 6 LV and 3 HV movements accessing the respective compound. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | Car parking may be provided within the respective compound.<br><br>It is noted that the Sydney Olympic Park P5 carpark would be utilised by construction workers (LV and HV) whilst the pipeline is being constructed. Both sides of the carpark would be utilised simultaneously.<br><br>As a result of the compound C27 erection, the western side of the P5 carpark would lose approximately 900 car parking spaces and the eastern side of the P5 carpark would lose approximately 890 spaces.<br><br>HV would load and unload at compounds as required.<br><br>Notably, these construction works would occur temporarily for a duration of 12 months. Special event mitigation measures have been outlined in Section 10, to mitigate the impacts of the car parking spaces temporarily lost as a result of the proposed construction works. |
| | On-street parking opportunities | There are limited nearby on-street parking opportunities. |
| | Impacts to on-street parking | There would be no impacts to on-street parking opportunities. |
| | Impacts to property access | URBNSURF would lose access to a certain amount of car parking spaces whilst these construction works are taking place. |
| | Traffic management measures | Construction works would occur to the south of Hill Road and across a section of Holker Busway. Whilst construction works occur on Holker Busway on a weekday at night, vehicles would make temporary detours by utilising the northeastern access to enter URBNSURF.<br><br>Notwithstanding, the construction works would be sectioned off by barriers and fences to minimise construction hazards and prioritise safety as much as practically possible. Traffic controllers would also be present on Holker Busway and Hill Road to guide other respective vehicles near the worksite.<br><br>TGS would be prepared, prior to the commencement of construction. |

| Section | Delegation | Impacts |
|---|---|---|
| | Potential road closures | Hill Road would be partially closed during this phase of construction works. Part of Holker Busway and an unnamed road connecting Hill Road to URBNSURF would be temporarily closed during this phase of construction works.<br><br>At least one (1) lane on Hill Road would be open to the public whilst the works are happening. |
| | Potential detours | One (1) lane at Hill Road would always be open for travel to the public.<br><br>Commuters would need to make detours onto Kevin Coombs Avenue and Pondage Link Road to continue onto Hill Road and Holker Street.<br><br>Traffic controllers would be present to guide vehicles towards these detour routes whilst the temporary construction works are happening. |
| | Traffic impact rating (without mitigation) | High |

## 7.3.8 River Release Pipeline Section 8

The river release pipeline section 8 is shown in Figure 7-21.

**Figure 7-21: River Release Pipeline Section 8**



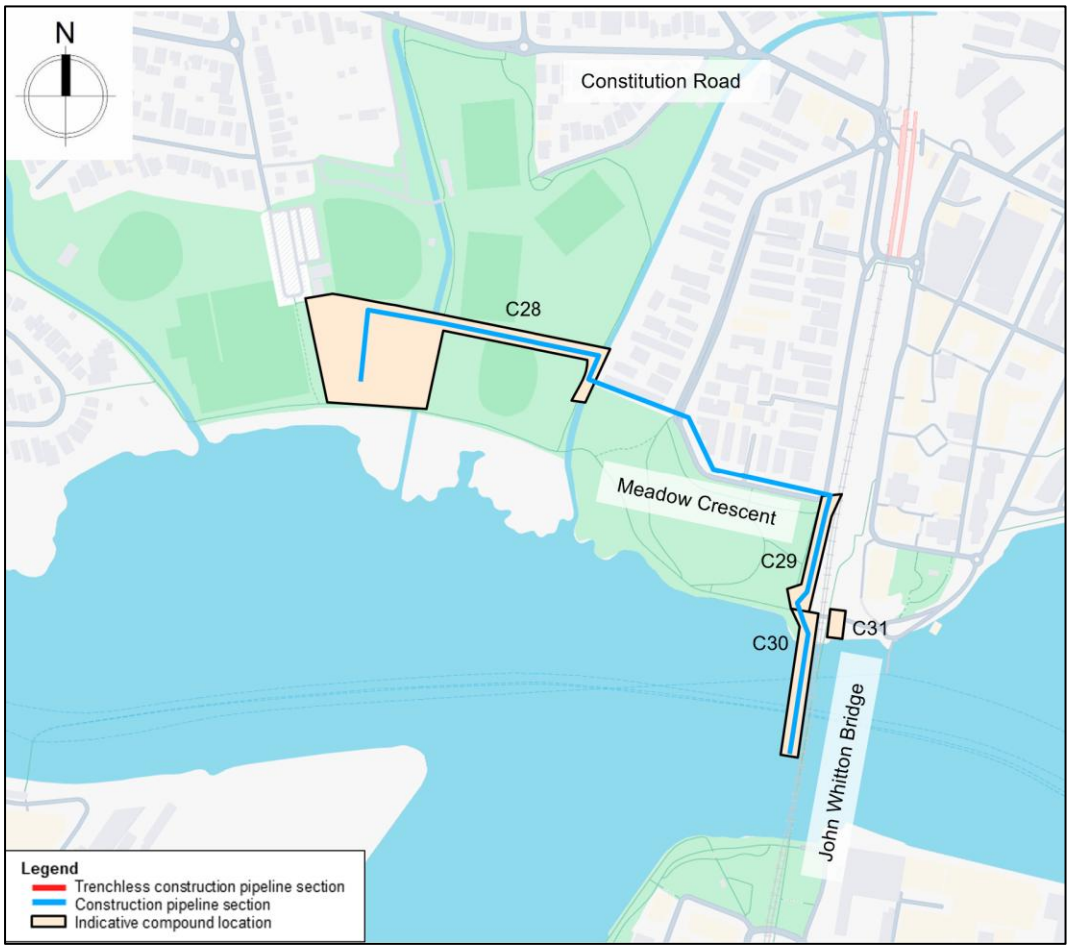

**Note:** Not to scale

Trenchless construction works are expected to occur at this section. In this regard, low traffic impacts are expected within this section of the river release section during construction.

### 7.3.9 River Release Pipeline Section 9

The river release pipeline section 9 is shown in Figure 7-22.

**Figure 7-22: River Release Pipeline Section 9**




**Note:** Not to scale

The respective impacts of the river release pipeline section 9 are described in Table 7.14. Traffic impact ratings following mitigation are shown in Section 10.

**Table 7.14: River Release Pipeline Section 9 – Transport Impacts during Construction**

| Section | Delegation | Impacts |
|---|---|---|
| **River release pipeline** | Distance | 890 metres |
| | Approximate start and end locations | 100 Adelaide Street, Meadowbank to 14A Meadow Crescent, Meadowbank. |
| | Public transport | Ferries and other ships would be impacted during this section of the construction works. |

| Section | Delegation | Impacts |
|---|---|---|
| **section 9** | | The Meadowbank Ferry Wharf provides access to ferries that operate at a frequency of approximately 15 to 30 minutes in both the westbound and eastbound directions.<br><br>Ferries and other ships would be asked to detour around compound C30. The detour would be provided through signage at John Whitton Bridge and posters at the Meadowbank Ferry Wharf.<br><br>Barges may need to float materials to the worksite and coordinate with other River users. The river may need to be shut down for two (2) weekends to facilitate construction in consultation with Transport for NSW, the Harbour Master and Sydney Ferries. |
| | Active transport | Shared paths are located to the west and south of Meadow Crescent. Some parts of the construction works would encroach upon the existing shared paths in the area. Access to shared paths would be maintained where possible, including underneath John Whitton Bridge. Where access cannot be maintained, pedestrians and cyclists would need to be detoured to other parts of the area whilst construction work is happening.<br><br>The respective signage and barriers/ fencing would be erected to guide pedestrians and cyclists about the detours during construction works. |
| | Crash occurrences | No crash records were identified in this area. |
| | Site compound access routes | 4 compounds would be erected in this section: C28, C29, C30 and C31.<br><br>Vehicles would access C28 by travelling on Church Street, heading onto Junction Street and turning onto Belmore Street and then Constitution Road. Vehicles would then still need to head on to Bank Street and then an access track in Meadowbank Park (which is connected to Constitution Road) to access C28.<br><br>Vehicles would access C29 to C31 by travelling on Church Street, heading onto Junction Street and turning onto Belmore Street and then Constitution Road. Vehicles would then still need to head on to Bank Street and then Meadow Crescent. |
| | Impacts to site compounds | Sydney Water has advised Stantec that the total daily expected numbers to enter the respective compounds would be 15 LV and 20 HV.<br><br>During the peak hours, there would be a total of 6 LV and 3 HV. This results in 6 LV and 3 HV movements accessing the respective compounds. This is expected to be minor and would have no significant impacts at the surrounding intersections. |
| | Car parking provision | The construction workforce is expected to utilise on-street parking opportunities nearby.<br><br>HV would load and unload at compounds as required. |
| | On-street parking opportunities | There are on-street parking opportunities on both sides of Meadow Crescent. |
| | Impacts to on-street parking | It is noted that approximately 34 on-street parking spaces would be lost at Meadow Crescent and 28 spaces would be lost as a result of erecting compound C30.<br><br>Notably, these construction works would only occur temporarily for a short duration of time (1 to 2 months). |

| Section | Delegation | Impacts |
|---|---|---|
| | | The construction workforce is not expected to utilise these parking opportunities whilst construction work is happening. |
| | Impacts to property access | The following driveways at these properties would potentially be impacted due to the pipeline works:<br>• 1-3 Bank Street, Meadowbank to 13 Bank Street, Meadowbank<br><br>Notably, these construction works would occur for a short duration of time (approximately 1 to 2 months) and construction workers would be advised not to impede driveways at these locations. Residents would be advised of these construction works and its temporary duration. During these works, residents can utilise on-street parking opportunities at Meadow Crescent and Bank Street. |
| | Traffic management measures | Construction works would occur on Meadow Crescent. Whilst this is occurring, vehicles would need to make temporary detours at Meadow Crescent. Notwithstanding, Meadow Crescent would be sectioned off by barriers and fences to minimise construction hazards and prioritise safety as much as practically possible. Traffic controllers would also be present on Meadow Crescent to guide other respective vehicles near the worksite.<br><br>TGS would be prepared, prior to the commencement of construction. |
| | Potential road closures | A section of Meadow Crescent would be closed during this phase of the construction works. Residents would be advised to take detours to park near their respective houses or access their homes. These routes are detailed below. |
| | Potential detours | Certain residents would need to make detours at Meadow Crescent (located to the west of the pipeline works) and Bank Street to park near their respective houses.<br><br>Traffic controllers would be present to guide vehicles towards these detour routes whilst the temporary construction works are happening. |
| | Traffic impact rating (without mitigation) | Medium |

# 8 Operational Traffic Impact Assessment

## 8.1 Traffic Generation

### 8.1.1 Vehicle Movements

In the operational phase, new staff and visitors would only be accessing the WRRF Site (staffing levels for the upgraded Camellia pumping station would remain essentially unchanged from existing levels). Sydney Water has provided Stantec with conservative (worst-case) weekly operational traffic volumes for vehicles entering and exiting the WRRF which are summarised in Table 8.1. The weekly trips were divided across five days to find the approximate trips per day.

**Table 8.1: Estimated Peak Traffic Movements for each Operational Activity**

| Activity | Type of Vehicle | Trips per Week | Trips per Day |
|---|---|---|---|
| **Staff journeys** | LV | 84 | 17 |
| **Residuals (biosolids, screenings, grit)** | HV | 60 | 12 |
| **Liquid chemical deliveries** | HV | 17 | 4 |
| **Other chemical deliveries** | HV | 3 | 1 |
| **Maintenance requirements** | HV | 10 | 2 |
| **Other trucks (spare parts, packages, cranes, etc)** | HV | 10 | 2 |
| **Total** | **LV** | **84** | **17** |
| | **HV** | **100** | **21** |

These numbers were then converted from a daily basis to a peak hourly basis, with the peak AM/ PM movements shown in Table 8.2. For the LV, it is noted that 50% of the daily construction workforce movements would occur in the AM peak (i.e. workforce arrivals) and 50% in the PM peak (workforce departures). The HV movements are assumed to be distributed evenly across the respective construction hours (and rounded up as a worst case to determine the peak hour volume).

**Table 8.2: Estimated Workforce at each Operational Stage Daily**

| Activity | Type of Vehicle | Daily Trips | Peak AM/ PM Trips |
|---|---|---|---|
| **Staff journeys** | LV | 17 | 9 |
| **Residuals (biosolids, screenings, grit)** | HV | 12 | 6 |
| **Liquid chemical deliveries** | HV | 4 | 2 |
| **Other chemical deliveries** | HV | 1 | 1 |
| **Maintenance requirements** | HV | 2 | 1 |
| **Other trucks (spare parts, packages, cranes, etc)** | HV | 2 | 1 |
| **Total** | **LV** | **28** | **9** |
| | **HV** | **18** | **11** |

Based on the above information, Table 8.2 sets out the operational vehicle trip generation for the daily and AM/ PM peak hours. It is noted that a maximum of 9 LV movements and 11 HV movements are expected to be generated by the WRRF once operational during the AM and PM peaks.

### 8.1.2 Vehicle Types

Most of the vehicles accessing the WRRF during the operational stage would be LVs and truck and dogs. Sydney Water has informed Stantec that on occasion, cranes and other plant machinery would be transported into the site by articulated vehicles (up to 20 metres).

Swept path assessments indicate that the largest vehicles anticipated for the site can access the driveways and enter/ exit the WRRF in a forward direction. This is shown within **Appendix C**.

### 8.1.3 Operational Vehicle Routes

The operational vehicle routes and traffic distributions for the WRRF are similar to the construction vehicle routes and distributions. These routes and distributions were previously outlined within Section 7.1.3.

Notably, the Devon Street access point would be the primary access and egress point for vehicles during the operational phase of the project.

## 8.2 Operational Impact Assessment

### 8.2.1 Operational Traffic Impacts

A comparison of the additional construction traffic movements and the operational traffic movements is provided in Table 8.3.

**Table 8.3: Peak Construction vs Operational Traffic Volumes at the WRRF**

| Type of Vehicle | Construction Traffic Volumes in the AM/ PM Peaks | Operational Traffic Volumes in the AM/ PM Peaks |
|---|---|---|
| **Light Vehicles** | 140 | 7 |
| **Heavy Vehicles** | 38 | 6 |
| **Total Vehicles** | **178** | **13** |

It is noted that the vehicle volumes during the operation of the WRRF are significantly lower than that of the construction vehicle volumes. As noted in Table 8.3, the peak operational traffic movements amount to 13 whilst the peak construction traffic movements are 178.

It is noted that a full construction traffic impact assessment was completed for the site in Section 7. The SIDRA INTERSECTION modelling results in Section 7.1 demonstrate the impacts of the peak construction traffic volumes at the following intersections:

- Grand Avenue/ James Ruse Drive
- Parramatta Road/ Wentworth Street
- Grand Avenue/ Colquhoun Street.

The assessment noted that the construction traffic impacts at the first two intersections above can be managed through mitigation traffic management measures during the AM/ PM peaks which represents the worst-case, conservative scenario as these peaks also include construction traffic volumes from PLR Stage 2 and the Sydney Metro West projects.

Comparatively, the peak operational traffic volumes are significantly lower compared to the peak construction traffic volumes. In this regard, the operational traffic volumes are not expected to have adverse impacts on the surrounding road network and are not anticipated to compromise the safety or function of the surrounding roads.

### 8.2.2 Operational Impacts to On-Street Parking

As described in Section 1.3 of this report, environmental planning instruments generally do not apply to SSI projects. Despite this, Sydney Water designed the WRRF with consideration to the local planning controls for the site and locality.

The WRRF proposes to provide 20 car parking spaces including two spaces for people with disabilities. This complies with and exceeds the Parramatta Council's DCP requirement by 13 spaces.

Parking for staff and visitors during the operation of the WRRF would be able to be fully contained within the WRRF site for both LVs and HVs. On-street parking opportunities would not be utilised by the operational workforce.

Therefore, the operational impacts to on-street parking are expected to be negligible.

### 8.2.3 Operational Impacts to Business and Property Access

The operational workforce would only enter and exit the WRRF site. In this regard, the operational traffic volumes would have no impacts to other businesses and properties.

### 8.2.4 Operational Impacts to Active Transport

The existing walking and cycling routes in the area are limited and fragmented. Currently, there are various safety issues associated with walking and cycling at Parramatta Road/ Great Western Highway (south of the WRRF) and on Grand Avenue (north of the WRRF) due to a lack of facilities such as footpaths and bicycle paths and proximity to high volumes of fast-moving traffic. With the small number of trips added to the network during the operational phase of the project, it is not expected that there would be any substantial traffic impacts to the active transport infrastructure near the WRRF.

The Camellia-Rosehill Place Strategy (DPE, 2022) aspires to improve the active transport network in the precinct. In keeping with this, Sydney Water is providing bike parking spaces as well as end of trip facilities in the WRRF building that would enable staff to travel to and from the site by alternative travel modes.

#### 8.2.4.1 Duck River Nature Trail

During the operational phase of this project, the operational workforce is not expected to travel within the vicinity of the Duck River Nature Trail. There would be no access from the Duck River Nature Trail directly into the WRRF site.

In this regard, the operational impacts to the Duck River Trail would be negligible.

### 8.2.5 Operational Impacts to Public Transport

The operational phase of the project would generate a minimal number of additional vehicles on the road. As a result, the project is not expected to impact the travel time of buses or the operation of strategic bus corridors in the vicinity of the project. The Camellia-Rosehill Place Strategy (DPE, 2022) proposes that the revitalised precinct would be supported by new bus services. The exact location, frequency and routes of these potential services are currently unknown. Sydney Water would continue to work with DPHI to support positive outcomes for the precinct.

Furthermore, there would be no operational impacts to light rail and train services associated with the operational phase of the project.

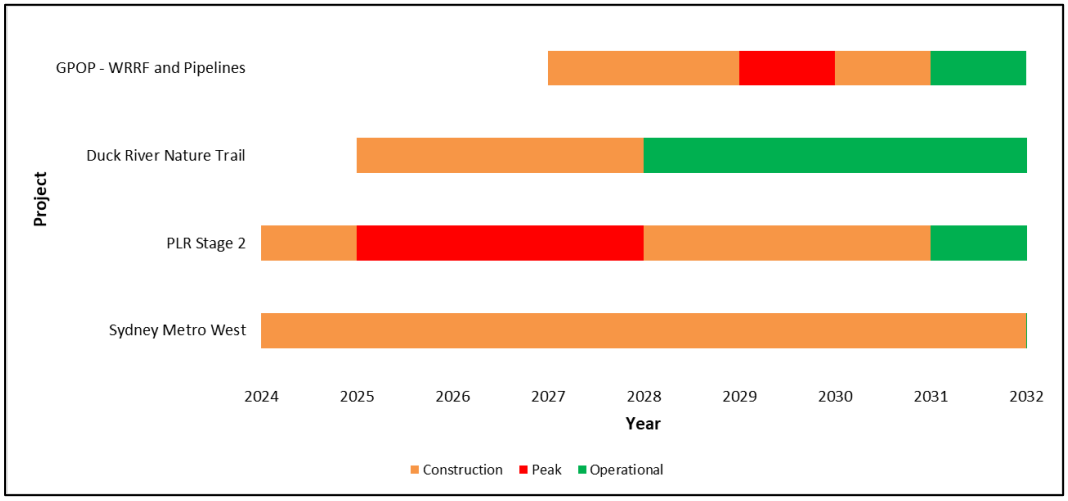
Therefore, the operational impacts to public transport infrastructure and services are expected to be negligible.

# 9 Cumulative Impacts

## 9.1 Cumulative Construction Impacts

The construction timeframes of the nearby transport projects have been referenced from the Parramatta Light Rail Stage 2: Environmental Impact Statement – Traffic and Transport (2022) and the Sydney Metro West – Rail infrastructure, stations, precincts and operations: Environmental Impact Statement – Technical Paper 2: Construction Traffic (2022). The expected construction timeframes for these projects as well as the Duck River Nature Trail in comparison to this project (GPOP) are outlined in Figure 9-1.

**Figure 9-1: Construction Timeframes of GPOP and Nearby Transport Projects**




It is important to note that the traffic surveys were conducted in 2025, when all reference projects were still in their construction phases. Since traffic volume growth is projected from 2025 to 2028, aligning with the peak construction year for the WRRF worksite, the growth assumptions used in the modelling are considered conservative (worst-case).

In this regard, the SIDRA INTERSECTION modelling assessment undertaken in Section 7.1 considers the construction traffic volumes from the two referenced projects and provides a robust, conservative assessment. The assessment has considered road works, road closures, haulage routes and construction worker parking from these projects.

### 9.1.1 Duck River Nature Trail

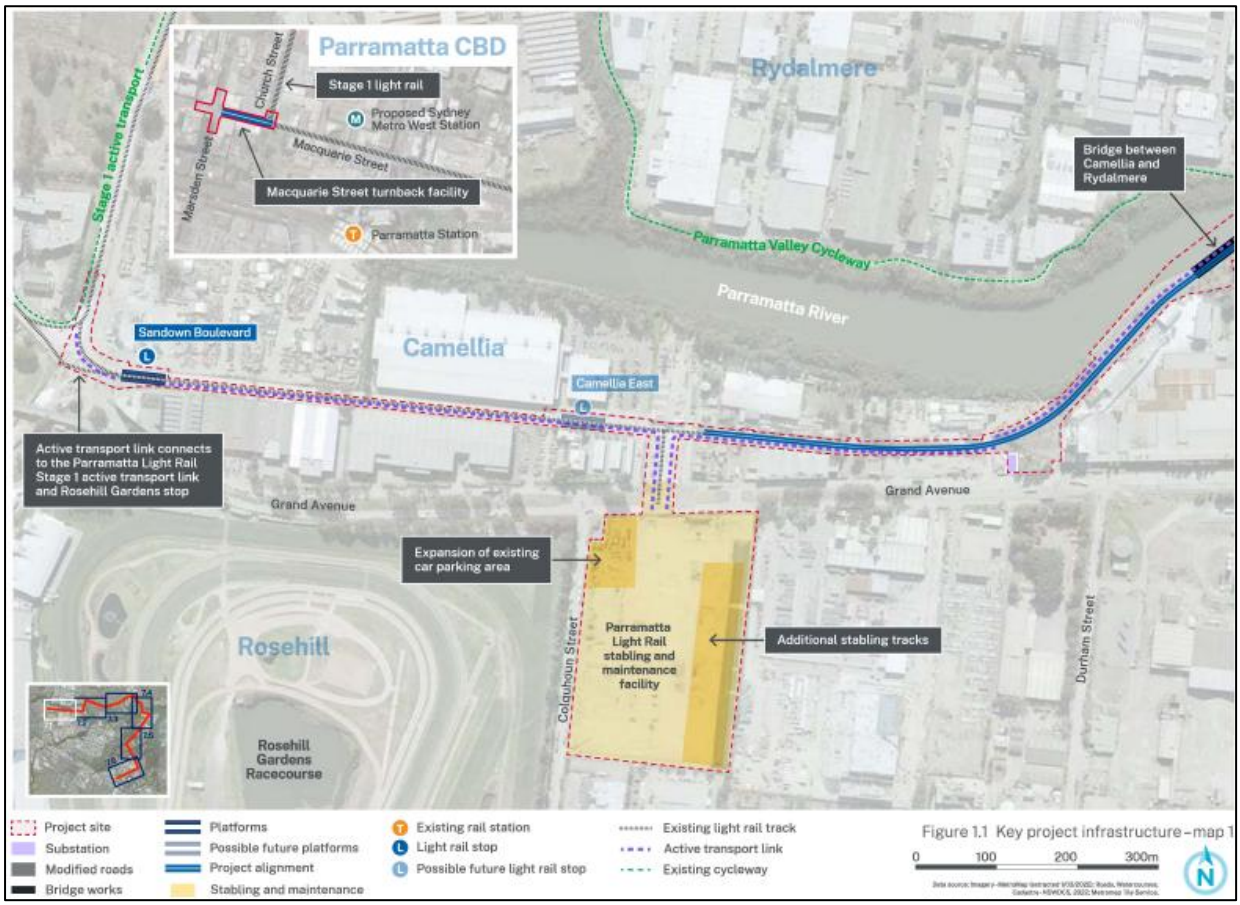
Construction of the river release pipeline in the vicinity of the nature trail would be mainly trenchless technology, and works are not expected to cause material disruptions to the Duck River Nature Trail Stage 3 construction works or users of the trail once complete. Given the minimal impact, no additional measures to retain pedestrian and cyclist access to the trail are necessary.

### 9.1.2 PLR Stage 2

As described in Section 4.3, PLR Stage 2 is currently under construction and is targeting operations in 2031. Construction works would be completed at two sites in the vicinity of the project area. These sites

are the Parramatta Light Rail stabling and maintenance facility and Construction Compounds 10-11 as shown in Figure 9-2 and Figure 9-3.

**Figure 9-2: Respective Study Area for Parramatta Light Rail Stabling and Maintenance Facility**




Source: Figure 2.9 of Amended Report - Parramatta Light Rail Stage 2 – Appendix A (NSW Government 2023)

**Figure 9-3: Respective Study Area for Compounds 10 and 11**


Source: Figure 2.9 of Amended Report - Parramatta Light Rail Stage 2 – Appendix A (NSW Government 2023)

The Amended Report – Appendices; Parramatta Light Rail Stage 2 – Appendix A (NSW Government 2023) forecasts the following construction movements (shown in Figure 9-4) daily and in the peak for the respective areas.

**Figure 9-4: Forecast Daily Construction Vehicle Movements – PLR Stage 2 (Stabling and Maintenance Facility and Sydney Olympic Park)**

Table 2.3 Estimated construction traffic volumes

| | Heavy vehicles | | Light vehicles (construction activities) | | Light vehicle (workforce) | |
|---|---|---|---|---|---|---|
| **Precinct/location** | **Daily[1]** | **Peak[2]** | **Daily[1]** | **Peak[2]** | **Daily[1]** | **Peak[2]** |
| Parramatta CBD | 50 | 4 | 24 | 6 | 75 | 30 |
| Stabling and maintenance facility | 50 | 4 | 24 | 6 | 63 | 25 |
| Camellia | 76 | 5 | 22 | 5 | 163 | 65 |
| Rydalmere | 136 | 9 | 26 | 6 | 188 | 75 |
| Ermington | 168 | 12 | 36 | 9 | 175 | 70 |
| Melrose Park | 50 | 4 | 24 | 6 | 175 | 70 |
| Wentworth Point | 123 | 9 | 24 | 6 | 175 | 70 |
| Sydney Olympic Park | 41 | 3 | 24 | 6 | 175 | 70 |
| Carter Street | 39 | 3 | 24 | 6 | 63 | 25 |
| **Total** | **733** | **53** | **228** | **56** | **1252** | **500** |

Notes: 1. Daily vehicle movements represent combined daily inbound and outbound movements (two way) for the peak construction period.
2. Peak vehicle movements represent combined inbound and outbound hourly movements for the morning and afternoon peak periods (8-9am and 5-6pm). For light vehicles associated with construction activities, the afternoon peak has been reported as the expected worst case.

Source: Table 2.3 of Amended Report - Parramatta Light Rail Stage 2 – Appendix A (NSW Government 2023)

Peak construction for both sites is expected to occur between Q2 2025 and Q1 2029. The construction vehicle haulage routes are shown in Figure 9-5 and Figure 9-6.

With regards to Figure 9-5, all daily construction vehicles from the PLR project would enter and exit the precinct from the James Ruse Drive/ Grand Avenue intersection. The Parramatta Light Rail Stage 2 Environmental Impact Statement; Technical Paper 2 – Transport and Traffic (NSW Government, 2022) assesses that in 2018, the James Ruse Drive/ Grand Avenue intersection operates at a LoS E (59 seconds delay) in the AM Peak and LoS D (46 seconds delay) in the PM Peak, without the construction traffic volumes. This intersection wasn't assessed with the construction volumes as it was outside the PLR 2 project corridor.

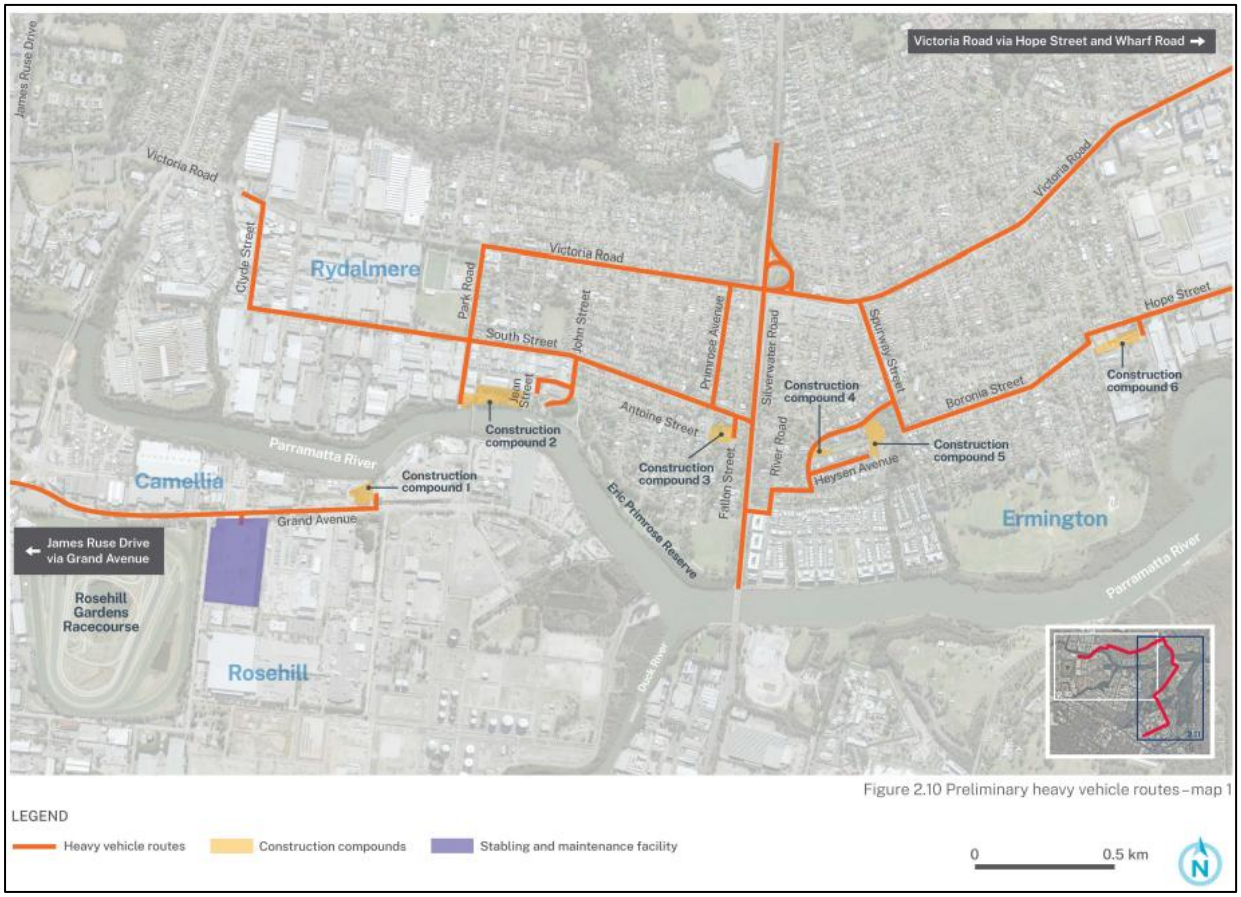
With regards to the GPOP project and as stated within Section 6.8.1, most vehicles would utilise the Wentworth Street/ Parramatta Road intersection as the primary route so that the construction vehicle haulage route does not align with the construction vehicle haulage route of the stabling and maintenance facility of PLR 2.

Notwithstanding, the Amended Report – Appendices; Parramatta Light Rail Stage 2 – Appendix A (NSW Government 2023) estimates that the stabling and maintenance facility would have a peak workforce of approximately 31 LV and 4 HV. It was concluded that this addition would result in minimal impacts to the surrounding network.

With regards to Figure 9-6, all daily construction vehicles would enter and exit Compounds 10 and 11 utilising Hill Road and Holker Street. Notably, this coincides with the construction vehicle routes mentioned within river release pipeline section 7. However, within this section of the pipeline, Sydney Water has advised Stantec that there would be a total of 6 LV and 3 HV during the peak hours (15 LV and 20 HV daily) that would be entering/ exiting the respective compound C29. In this regard, the

cumulative construction impacts for this part of the works are expected to be minor and would have no significant impacts at the surrounding intersections.

**Figure 9-5: Construction Vehicle Haulage Routes – Stabling and Maintenance Facility**




Source: Figure 2.10 of Amended Report - Parramatta Light Rail Stage 2 – Appendix A (NSW Government 2023)

**Figure 9-6: Construction Vehicle Haulage Routes – Sydney Olympic Park**


Source: Figure 2.11 of Amended Report - Parramatta Light Rail Stage 2 – Appendix A (NSW Government 2023)

### 9.1.3 Sydney Metro West

As described in Section 4.4, Sydney Metro West is currently under construction and is targeting operations in 2032. Sydney Metro would be carrying out construction at two sites in the vicinity of the project area for the GPOP Water Cycle Management Project (this project). These sites are at Clyde and Rosehill, and Sydney Olympic Park.

The Sydney Metro West – Rail infrastructure, station, precincts and operations Environmental Impact Statement Technical Paper 2: Construction transport (Sydney Metro 2022) forecasts the following construction movements (shown in Figure 9-7 and Figure 9-8) per day and by phase.

**Figure 9-7: Forecast Daily Construction Vehicle Movements - Clyde and Rosehill Metro Sites**

| Phase | Total movements per day | | |
|---|---|---|---|
| | Light vehicles | Heavy vehicles | Total |
| **Clyde stabling and maintenance facility construction site** | | | |
| Phase 1 – Site establishment | 306 | 264 | 570 |
| Phase 2 – Facility construction and fit-out, including rail systems fit-out | 408 | 320 | 728 |
| Phase 3 – Aboveground facility buildings | 302 | 180 | 482 |
| **Rosehill services facility construction site** | | | |
| Phase 1 – Site establishment | 74 | 76 | 150 |
| Phase 2 – Facility construction and fit-out, including rail systems fit-out | 100 | 132 | 232 |
| Phase 3 – Aboveground facility buildings | 92 | 104 | 196 |

Source: Sydney Metro West – Rail Infrastructure, Station, Precincts and Operations Environmental Impact Statement – Technical Paper 2: Construction Transport (Sydney Metro 2022)

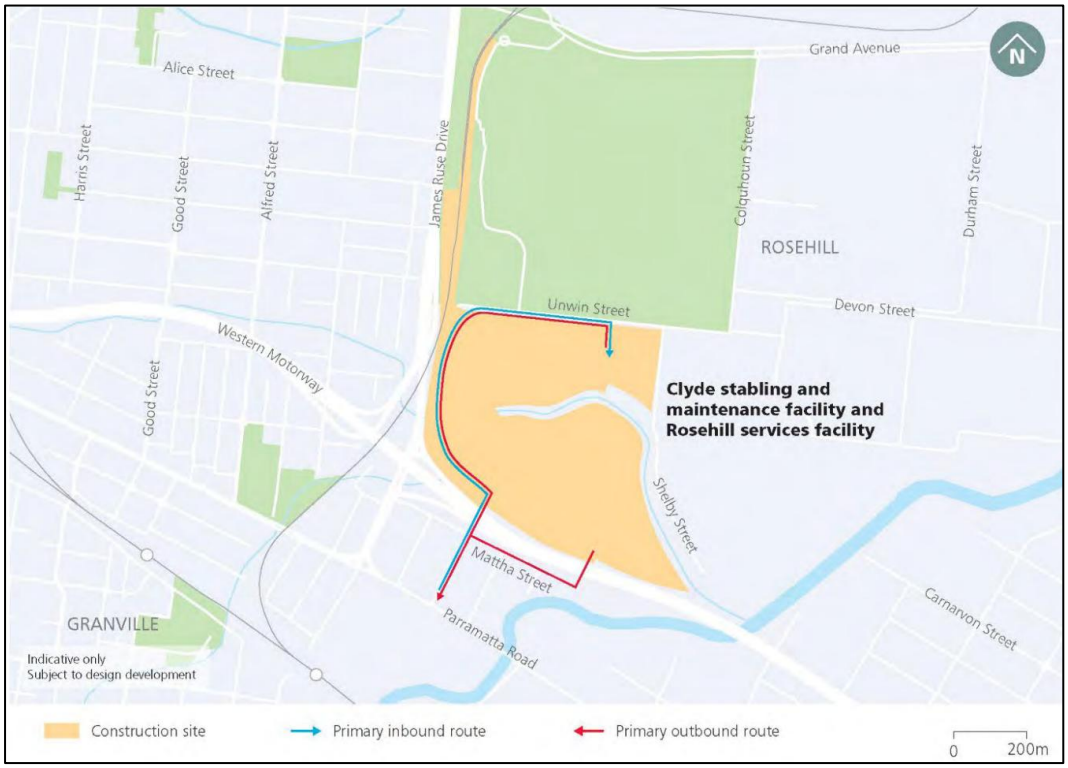
**Figure 9-8: Forecast Daily Construction Vehicle Movements – Sydney Olympic Park Metro Site**

| Phase | Total movements per day | | |
|---|---|---|---|
| | Light vehicles | Heavy vehicles | Total |
| Phase 1 – Site establishment | 142 | 124 | 266 |
| Phase 2 – Station construction and fit-out | 226 | 224 | 450 |
| Phase 3 – Aboveground station buildings and precinct | 116 | 104 | 220 |

Source: Sydney Metro West – Rail Infrastructure, Station, Precincts and Operations Environmental Impact Statement – Technical Paper 2: Construction Transport (Sydney Metro 2022)

Peak construction is expected to occur between Q3 2026 and Q4 2027 at Rosehill, and Q3 2025 and Q2 2028 at Clyde. The indicative construction programs for both sites indicate that there is potential for both Phase 2 and Phase 3 construction to occur concurrently. Sydney Metro's proposed indicative construction vehicle haulage routes are shown in Figure 9-9. Under this arrangement, all daily construction vehicles would enter and exit the precinct from Wentworth Street, onto Parramatta Road. The Sydney Metro West – Rail infrastructure, station, precincts and operations Environmental Impact Statement Technical Paper 2: Construction transport (Sydney Metro 2022a) assesses that in 2026 during construction, the intersection of Martha Street and Wentworth Street would perform at a LoS A during the AM and PM peak periods. The Wentworth Street and Parramatta Road intersection was also forecast to perform at a LoS C during the AM peak and a LoS B during the PM peak.

**Figure 9-9: Construction Vehicle Haulage Routes – Clyde and Rosehill Services Facility Site**




Source: Sydney Metro West – Rail Infrastructure, Station, Precincts and Operations Environmental Impact Statement – Technical Paper 2: Construction Transport (Sydney Metro 2022)

Table 7.1 of this assessment indicates that in 2028, both with and without the GPOP project, the Wentworth Street and Parramatta Road intersection would perform at a LoS F. This is a reduction in service from the 2026 forecast, however, this reduced service is not attributed to construction of the project. The proposal to implement primary and secondary construction vehicle haulage routes would contribute to reducing some pressure on the intersection of Wentworth Street/ Parramatta Road during construction.

The Sydney Metro West – Rail infrastructure, station, precincts and operations Environmental Impact Statement Technical Paper 3: Operational transport (Sydney Metro 2022b) estimates that the Clyde maintenance and stabling facility site would be permanently staffed through the day and night. Around 70 – 100 staff would work at the site over a 24-hour period. An additional 33 office staff would work between 9 am to 5 pm. The assessment concludes that these staff would result in minimal impacts to the surrounding network.

## 9.2 Cumulative Operational Impacts

The cumulative impacts to the nearby projects when the WRRF is operational are described in the following sections.

### 9.2.1 Duck River Nature Trail

The Duck River Nature Trail construction works are expected to be complete once the WRRF is operational.

Therefore, the cumulative operational traffic impacts of the WRRF are minimal, as the Duck River Nature Trail would already be operational once the WRRF is operational as well.

### 9.2.2 PLR Stage 2

The construction works associated with the PLR Stage 2 would be complete prior to the commencement of the WRRF operation in Q2 2031. As stated within the Parramatta Light Rail Stage 2: Environmental Impact Statement – Traffic and Transport (2022), the peak construction period is expected to be during 2026 and 2027 and the methodology considered that all areas along the alignment are assumed to be under construction simultaneously when assessing its overall traffic impacts. The expected timeframe for the PLR Stage 2 to become operational is 2032.

Notably, the WWRF would be operational in 2031.

Therefore, the cumulative operational traffic impacts of the WRRF worksite are minimal, as it would not coincide with the peak construction traffic volumes of the PLR Stage 2 project.

### 9.2.3 Sydney Metro West

The peak construction works associated with the Sydney Metro West project (between Q3 2026 and Q4 2027 at Rosehill and Q3 2025 and Q2 2028 at Clyde) should be complete prior to the commencement of operations at the WRRF. In this regard, the operational traffic volumes of the WRRF would not coincide with the peak traffic volumes of the Sydney Metro West project as the WRRF would not be operational until 2031.

Therefore, the cumulative operational traffic impacts of WRRF are minimal, as it would not coincide with the peak construction traffic volumes of the Sydney Metro West project.

# 10 Mitigation Measures

This section outlines potential mitigation measures required to minimise the impacts of the project within the study area.

## 10.1 Mitigation Measures during Construction

The Site Specific CTMPs (SSCTMPs) would define the appropriate measures to mitigate the impacts of the project on the transport network during the construction phase. These measures would be driven by the controls outlined in the Framework CTMP. The Framework CTMP outlines the appropriate traffic management controls for the construction phase of the project and is attached within **Appendix D** of this report.

The impacts of the project on the transport network during construction would be mitigated using the measures outlined in Table 10.1.

**Table 10.1: Mitigation Measures – Construction**

| Reference | Location | **Potential Impact** | **Mitigation Measure** | **Impact Significance following Mitigation** |
|---|---|---|---|---|
| **TT01** | WRRF | Traffic congestion at the Grand Avenue/ James Ruse Drive and Wentworth Street/ Parramatta Road intersections due to traffic volumes (background and construction) | • Prepare and implement a Construction Traffic Management Plan (CTMP) in accordance with the Framework Construction Traffic Management Plan (Appendix D). The CTMP would outline:<br>○ staging and timing of construction for each area of the project<br>○ any changes to traffic conditions, including road closures or diversions<br>○ identification of haulage routes, avoiding use of nominated local roads<br>○ safe alternative routes for pedestrians, cyclists and other active transport in accordance with relevant safety standards<br>○ parking arrangements for construction workers<br>○ construction access points<br>○ measures to minimise impacts on public transport network, including bus stops<br>○ opportunities to reduce road traffic noise, including restricting heavy vehicle movements to standard construction hours | Medium |

| Reference | Location | **Potential Impact** | **Mitigation Measure** | **Impact Significance following Mitigation** |
|---|---|---|---|---|
| | | | ○ measures to minimise impacts to businesses<br>○ measures to outline construction interface management with the PLR2 and Sydney Metro West projects.<br>○ Schedule deliveries outside of the AM/ PM peak hours where possible.<br>• Site Specific Construction Traffic Management Plans (SSCTMP) are also to be prepared for key intersections in consultation with relevant local councils, impacted residents and businesses, TfNSW and in accordance with relevant guidelines and the Framework CTMP.<br>• Construction traffic management measures to be implemented as part of SSCTMPs compliant with controls outlined in the Draft Framework CTMP. | |
| **TT02** | River release section pipeline section 7 | Special events management | • Where special events require specific traffic and pedestrian management, measures would be developed and implemented in consultation with Sydney Olympic Park Authority (SOPA), the Australian Turf Club and other relevant stakeholders. | Medium |
| **TT03** | Brine pipeline sections 3 and 5 along with river release pipeline sections 2 to 5, 7 and 9 | Temporary disruption to public transport infrastructure along the construction corridor | • Liaison with state authorities, local councils, stakeholders and operators (including bus operators) to develop temporary solutions.<br>• Implement proactive notifications and signage in line with the Community and Stakeholder Engagement Plan where relevant. | Low |
| **TT04** | Brine pipeline sections 2 to 5 along with river release pipeline sections 2 to 5, 7 and 9. | Temporary disruption to footpaths, cycle routes and public spaces | • Maintain access (wherever possible) or provide alternate safe access routes<br>• When this is not possible, liaison with local councils and stakeholders to develop temporary solutions would be undertaken (if required).<br>• Implement proactive notifications and signage in line with the Community and Stakeholder Engagement Plan where relevant. | Low |

| Reference | Location | **Potential Impact** | **Mitigation Measure** | **Impact Significance following Mitigation** |
|---|---|---|---|---|
| **TT05** | Brine pipeline sections 3 to 5 along with river release pipeline sections 2 to 5, 7 and 9 | Temporary impacts to dwellings and business access including from road closures and temporary removal of on-street parking | • Liaison with local councils and stakeholders, including affected residents and businesses to develop temporary solutions. | Low |
| **TT06** | WRRF | Cumulative traffic impacts from nearby construction including from Sydney Metro West and Stage 2 of Parramatta Light Rail | • Continue ongoing engagement with Sydney Metro, Parramatta Light Rail, other developers and relevant councils to understand specific transport and access needs with ongoing and planned developments. | Low |

## 10.2 Mitigation Measures during Operation

The impacts of the project on the transport network during the operational phase would be low given the small number of daily operational vehicles. In addition, changes to the road network to improve traffic and congestion are anticipated as part of the precinct re-development.

Furthermore, operational deliveries and other operational vehicle movements can be scheduled to occur outside of the AM/ PM peak hours to minimise queuing on Grand Avenue/James Ruse Drive.

As such, no operational mitigation measures are considered necessary for the project.

# 11 Summary and Conclusions

Based on the analysis and discussions presented within this report, the following conclusions are made:

- It is proposed to build the following:
  - a new WRRF at Camellia-Rosehill to treat wastewater to produce advanced treated water
  - upgrades to the existing pumping station at Camellia
  - a new wastewater transfer pipeline from Camellia pumping station to the WRRF
  - a new and repurposed brine pipeline to transfer brine from the WRRF to the NSOOS
  - a new river release pipeline to transfer advanced treated water from the WRRF to a release structure in the Parramatta River at Meadowbank
- **Construction impacts**
  - Three existing intersections were modelled within SIDRA INTERSECTION to review how construction vehicles accessing the WRRF site would impact these intersections. The three modelled intersections were:
    - » Grand Avenue/ James Ruse Drive
    - » Parramatta Road/ Wentworth Street
    - » Grand Avenue/ Colquhoun Street
  - The existing SIDRA INTERSECTION modelling results indicate that the Grand Avenue/ Colquhoun Street intersection operates well in 2025, but the Grand Avenue/ James Ruse Drive and Parramatta Road/ Wentworth Street intersections operate unsatisfactorily as they are constrained (with DoS equal to or greater than 1), and have a LoS of E or F in the AM/ PM Peaks
    - » The SIDRA INTERSECTION modelling assessment considers the existing construction traffic volumes from PLR Stage 2 and the Sydney Metro West projects, as the traffic volumes were surveyed in February 2025. In this regard, the SIDRA INTERSECTION modelling assessment is robust and provides a cumulative impact assessment of the existing conditions.
  - The site is expected to generate up to 140 LV and 38 HV movements at the WRRF site in the AM/ PM peak hours during construction
  - Further SIDRA INTERSECTION modelling was undertaken for future case scenarios in 2028 (when peak construction for the WRRF commences), without and with construction traffic. Notably, a growth factor was applied to the surveyed volumes (with the cumulative traffic volumes) to provide the future baseline scenario. The following results were found:
    - » Grand Avenue/ Colquhoun Street intersection operates well both without and with construction traffic
    - » At the Grand Avenue/ James Ruse Drive and Wentworth Street/ Parramatta Road intersections, it was noted that they operate unsatisfactorily both in the base case (2025) and future base case (2028) scenarios. With the addition of construction traffic at both intersections during the AM Peak, it is noted that the impacts may require certain mitigation traffic management measures which are outlined within Section 10. With the addition of construction traffic at both intersections during the PM Peak, traffic impacts are minimal when compared to the future base case scenario in 2028.
    - » The brine pipeline, transfer pipeline and river release pipeline were cordoned off in sections so that each section can be reviewed with regards to its impacts to active transport, public transport and overall safety. These impacts have been explored within Sections 7.2 and 7.3 of the report.

    - » General traffic management measures for certain lane closures (such as traffic controllers and signage, potential detour routes, bus stop relocation, nighttime works, etc) have been proposed to reduce construction impacts
    - » Furthermore, certain mitigation measures have also been detailed within Section 10 to reduce construction traffic impacts as much as practically possible
    - » Parking would be contained on-site within the respective compounds during construction as far as possible, but some on-street parking opportunities may be utilised during the process if required
  - The Framework CTMP also provides mitigation measures that can be implemented to reduce construction traffic impacts
- **Operational impacts**
  - The peak operational traffic volumes during the AM/ PM Peaks are expected to be 7 LV and 6 HV movements
    - » When compared to the AM/ PM Peak construction traffic volumes, it is noted that the peak operational traffic is significantly lower. In this regard, the operational traffic volumes are not expected to have adverse impacts on the surrounding road network and are not anticipated to compromise the safety or function of the surrounding roads when approaching and departing from the WRRF
  - During the operational phase of the project, parking for staff and visitors would be fully contained on-site. No on-street parking opportunities would be utilised
  - No impacts to businesses and nearby properties are expected during the operational phase
  - No impacts to the active and public transport infrastructure are expected during the operational phase
  - The operational traffic volumes from the WRRF site do not align with the PLR Stage 2 and the Sydney Metro West peak construction volumes, as it is understood that the peak construction phases for the PLR Stage 2 and the Sydney Metro West projects would have ended before the WRRF becomes operational.

# 12 References

In preparing this report, reference has been made to the following:


- Road Acts 1993 (NSW Government, 2025)
- Walking Space Guide: Towards Pedestrian Comfort and Safety (TfNSW, 2020)
- Cycleway Design Toolbox: Designing for Cycling and Micromobility (TfNSW, 2020)
- NSW Road Rules 2014 (NSW Government, 2025)
- TfNSW Traffic Control at Work Site – Technical Manual (TfNSW, 2022)
- Guide to Transport Impact Assessment – Technical Guidance for Transport Practitioners (TfNSW, 2024)
- Guide to Traffic Management Part 12: Traffic Impacts of Developments (Austroads, 2009)
- Traffic Modelling Guidelines (Roads and Maritime Services, 2013) (RMS)
- Road Design Guide (RTA, 1988)
- Australian/New Zealand Standard, Parking Facilities (AS 2890)
- Camellia-Rosehill Place Strategy Traffic and Transport Implementation Report (DPE, 2022)
- The Parramatta Light Rail Stage 2 Environmental Impact Statement; Technical Paper 2 – Transport and Traffic (NSW Government, 2022)
- Amended Report – Appendices; Parramatta Light Rail Stage 2 – Appendix A (NSW Government, 2023)
- Sydney Metro West – Rail Infrastructure, Stations, Precincts and Operations (Environmental Impact Statement, 2022)
- Duck River Trail Phase 1 (Review of Environmental Factors, 2025)
- City of Parramatta Development Control Plan (DCP).

-

# Appendices

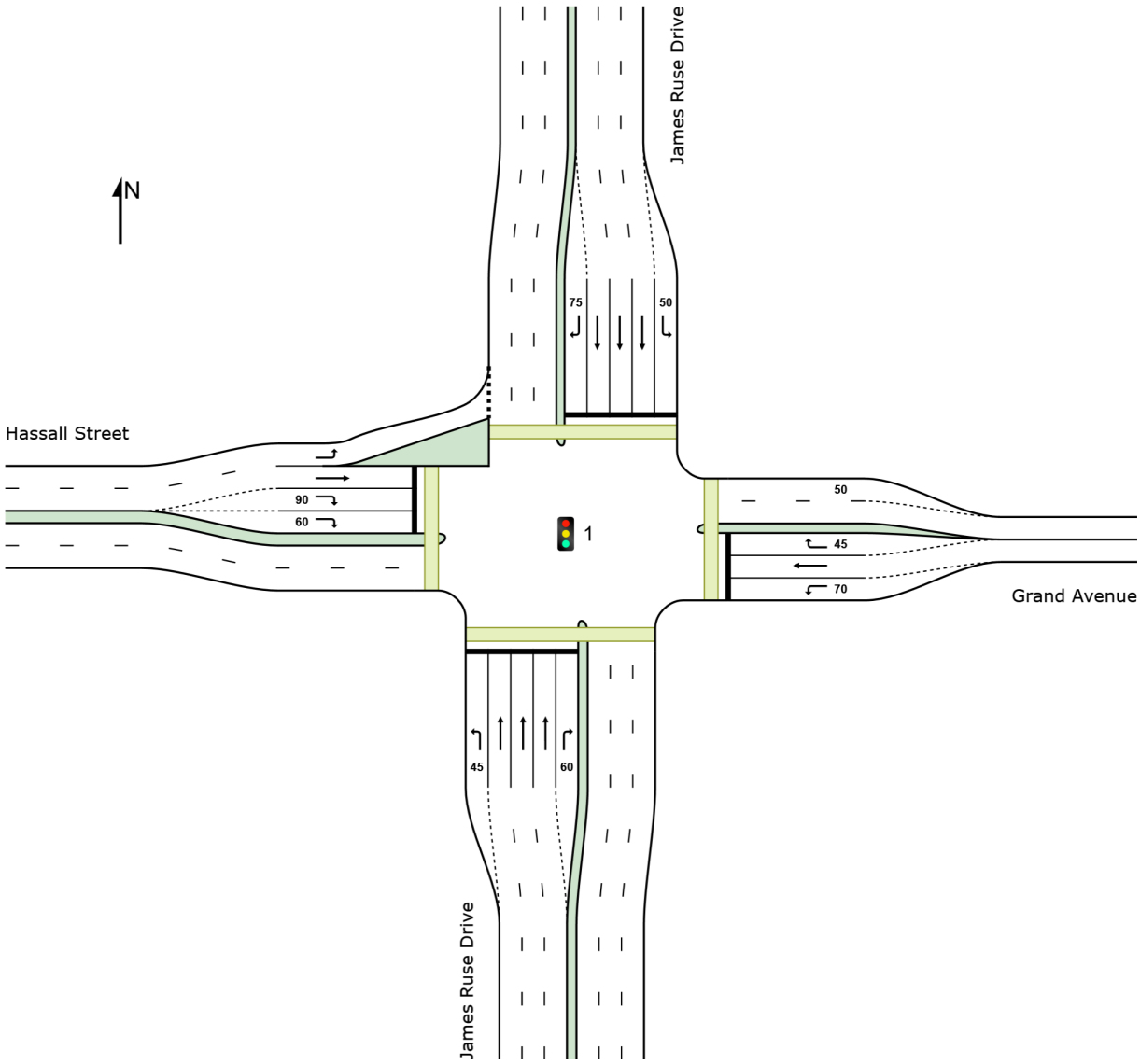
# Appendix A. Existing Scenario (2025) - SIDRA INTERSECTION Modelling Results

# SITE LAYOUT

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - AM (Site Folder: Existing 2025)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

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# MOVEMENT SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - AM (Site Folder: Existing 2025)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**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: James Ruse Drive | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 304 | 4.5 | 304 | 4.5 | 0.261 | 36.6 | LOS C | 5.1 | 36.9 | 0.45 | 0.72 | 0.45 | 48.4 |
| 2 | T1 | All MCs | 2239 | 7.5 | 2239 | 7.5 | * 0.925 | 67.4 | LOS E | 66.6 | 496.0 | 1.00 | 1.03 | 1.13 | 49.7 |
| 3 | R2 | All MCs | 148 | 51.8 | 148 | 51.8 | 0.875 | 113.2 | LOS F | 12.2 | 123.4 | 1.00 | 0.97 | 1.29 | 27.0 |
| Approach | | | 2692 | 9.6 | 2692 | 9.6 | 0.925 | 66.4 | LOS E | 66.6 | 496.0 | 0.94 | 0.99 | 1.07 | 44.1 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 145 | 65.2 | 145 | 65.2 | * 0.537 | 40.7 | LOS C | 7.2 | 78.9 | 0.94 | 0.80 | 0.94 | 32.0 |
| 5 | T1 | All MCs | 40 | 31.6 | 40 | 31.6 | 0.309 | 72.8 | LOS F | 2.9 | 25.5 | 0.98 | 0.73 | 0.98 | 25.4 |
| 6 | R2 | All MCs | 103 | 40.8 | 103 | 40.8 | 0.896 | 94.3 | LOS F | 8.7 | 81.9 | 1.00 | 1.04 | 1.38 | 38.7 |
| Approach | | | 288 | 51.8 | 288 | 51.8 | 0.896 | 64.3 | LOS E | 8.7 | 81.9 | 0.96 | 0.87 | 1.10 | 34.6 |
| North: James Ruse Drive | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 211 | 12.5 | 211 | 12.5 | 0.206 | 45.7 | LOS D | 6.9 | 53.1 | 0.49 | 0.73 | 0.49 | 55.0 |
| 8 | T1 | All MCs | 2173 | 5.6 | 2173 | 5.6 | 0.902 | 63.1 | LOS E | 59.3 | 435.4 | 0.99 | 0.99 | 1.09 | 50.8 |
| 9 | R2 | All MCs | 157 | 9.4 | 157 | 9.4 | * 0.845 | 107.5 | LOS F | 12.4 | 93.6 | 1.00 | 0.93 | 1.22 | 39.1 |
| Approach | | | 2540 | 6.4 | 2540 | 6.4 | 0.902 | 64.4 | LOS E | 59.3 | 435.4 | 0.95 | 0.96 | 1.05 | 46.4 |
| West: Hassall Street | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 571 | 5.0 | 571 | 5.0 | 0.945 | 86.5 | LOS F | 44.1 | 321.9 | 1.00 | 1.17 | 1.23 | 32.9 |
| 11 | T1 | All MCs | 214 | 9.4 | 214 | 9.4 | * 0.793 | 71.7 | LOS F | 16.0 | 120.8 | 1.00 | 0.91 | 1.11 | 29.9 |
| 12 | R2 | All MCs | 389 | 8.6 | 389 | 8.6 | 0.759 | 76.6 | LOS F | 14.4 | 107.9 | 1.00 | 0.88 | 1.08 | 21.9 |
| Approach | | | 1174 | 7.0 | 1174 | 7.0 | 0.945 | 80.5 | LOS F | 44.1 | 321.9 | 1.00 | 1.02 | 1.16 | 30.1 |
| All Vehicles | | | 6694 | 9.8 | 6694 | 9.8 | 0.945 | 68.0 | LOS E | 66.6 | 496.0 | 0.96 | 0.98 | 1.08 | 42.3 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: James Ruse Drive | | | | | | | | | | | | |
| P1 | Full | 6 | 6 | 69.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Grand Avenue | | | | | | | | | | | |
| P2 | Full | 1 | 1 | 69.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |
| North: James Ruse Drive | | | | | | | | | | | |
| P3 | Full | 6 | 6 | 69.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |
| West: Hassall Street | | | | | | | | | | | |
| P4 | Full | 13 | 14 | 69.2 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |
| All Pedestrians | | 26 | 27 | 69.1 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# PHASING SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - AM (Site Folder: Existing 2025)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns**
**Input Phase Sequence: A, D, E, F, F1*, F2***
**Output Phase Sequence: A, D, E, F, F2***
**Reference Phase: Phase A**
(* Variable Phase)

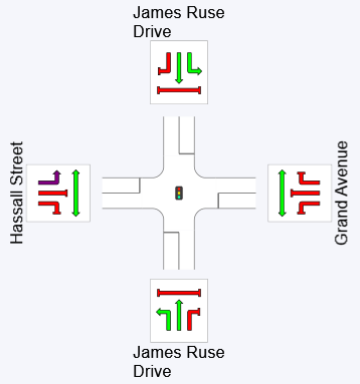
### Phase Timing Summary

| Phase | A | D | E | F | F2 |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 78 | 96 | 124 | 146 |
| Green Time (sec) | 72 | 12 | 22 | 16 | *** |
| Phase Time (sec) | 78 | 18 | 28 | 22 | 4 |
| Phase Split | 52% | 12% | 19% | 15% | 3% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

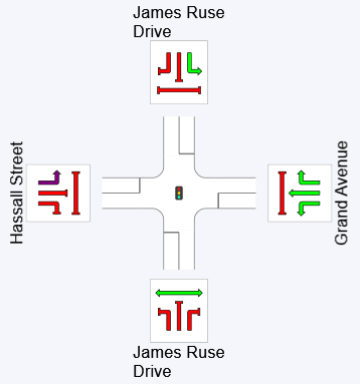
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence

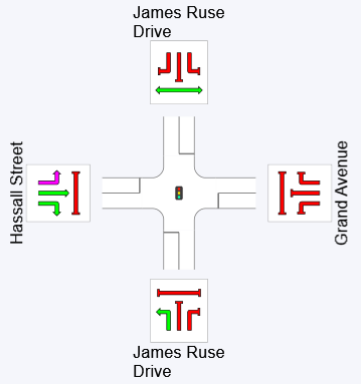
**Phase A** REF



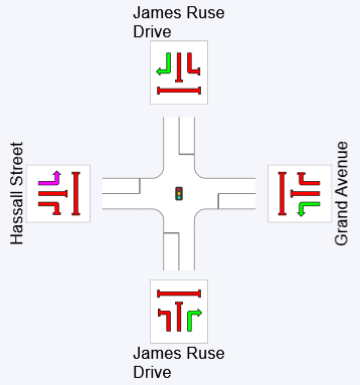

**Phase D**



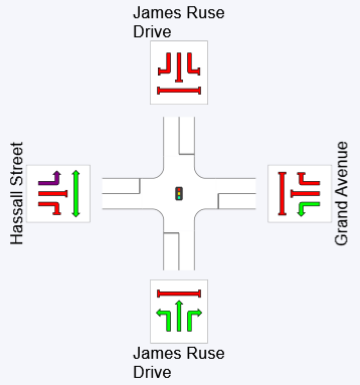

**Phase E**



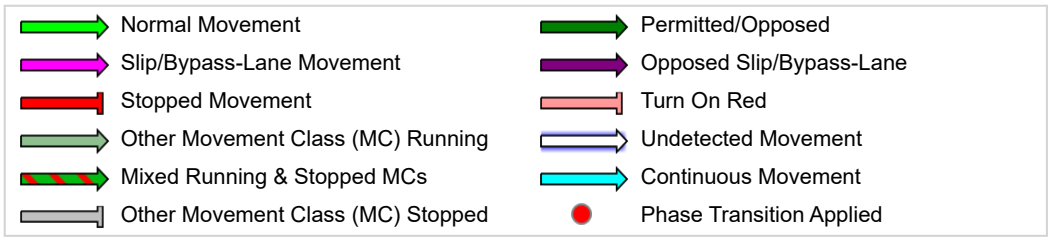

**Phase F**




**Phase F2** VAR



REF: Reference Phase
VAR: Variable Phase

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# MOVEMENT SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - PM (Site Folder: Existing 2025)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 160 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**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: James Ruse Drive | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 246 | 4.3 | 246 | 4.3 | 0.219 | 48.9 | LOS D | 4.3 | 31.3 | 0.46 | 0.72 | 0.46 | 47.6 |
| 2 | T1 | All MCs | 2145 | 2.3 | 2145 | 2.3 | * 1.061 | 157.4 | LOS F | 91.5 | 653.0 | 1.00 | 1.41 | 1.53 | 34.2 |
| 3 | R2 | All MCs | 119 | 22.1 | 119 | 22.1 | 0.989 | 159.4 | LOS F | 11.9 | 99.1 | 1.00 | 1.06 | 1.56 | 22.6 |
| Approach | | | 2511 | 3.4 | 2511 | 3.4 | 1.061 | 146.9 | LOS F | 91.5 | 653.0 | 0.95 | 1.33 | 1.43 | 31.0 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 286 | 10.3 | 286 | 10.3 | 0.854 | 49.4 | LOS D | 15.7 | 119.2 | 1.00 | 0.91 | 1.14 | 33.7 |
| 5 | T1 | All MCs | 87 | 2.4 | 87 | 2.4 | 0.383 | 91.7 | LOS F | 6.4 | 45.7 | 0.97 | 0.76 | 0.97 | 26.1 |
| 6 | R2 | All MCs | 200 | 3.7 | 200 | 3.7 | * 1.036 | 166.4 | LOS F | 21.6 | 156.1 | 1.00 | 1.22 | 1.62 | 32.7 |
| Approach | | | 574 | 6.8 | 574 | 6.8 | 1.036 | 96.6 | LOS F | 21.6 | 156.1 | 1.00 | 1.00 | 1.28 | 30.8 |
| North: James Ruse Drive | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 74 | 2.9 | 74 | 2.9 | 0.069 | 55.9 | LOS D | 2.4 | 17.2 | 0.45 | 0.70 | 0.45 | 55.0 |
| 8 | T1 | All MCs | 2212 | 3.2 | 2212 | 3.2 | 0.974 | 99.0 | LOS F | 75.3 | 541.4 | 1.00 | 1.16 | 1.24 | 43.5 |
| 9 | R2 | All MCs | 205 | 3.6 | 205 | 3.6 | * 1.067 | 195.7 | LOS F | 23.2 | 167.7 | 1.00 | 1.17 | 1.71 | 28.0 |
| Approach | | | 2491 | 3.3 | 2491 | 3.3 | 1.067 | 105.7 | LOS F | 75.3 | 541.4 | 0.98 | 1.14 | 1.25 | 38.4 |
| West: Hassall Street | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 500 | 1.9 | 500 | 1.9 | 0.653 | 48.2 | LOS D | 25.2 | 179.3 | 0.86 | 0.99 | 0.86 | 39.0 |
| 11 | T1 | All MCs | 53 | 4.0 | 53 | 4.0 | 0.123 | 52.8 | LOS D | 3.2 | 23.4 | 0.83 | 0.64 | 0.83 | 35.1 |
| 12 | R2 | All MCs | 632 | 2.7 | 632 | 2.7 | * 1.055 | 179.8 | LOS F | 36.1 | 258.2 | 1.00 | 1.20 | 1.63 | 13.2 |
| Approach | | | 1184 | 2.4 | 1184 | 2.4 | 1.055 | 118.6 | LOS F | 36.1 | 258.2 | 0.93 | 1.09 | 1.27 | 23.6 |
| All Vehicles | | | 6759 | 3.5 | 6759 | 3.5 | 1.067 | 122.5 | LOS F | 91.5 | 653.0 | 0.96 | 1.19 | 1.32 | 32.5 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: James Ruse Drive | | | | | | | | | | | | |
| P1 | Full | 3 | 3 | 74.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Grand Avenue | | | | | | | | | | | | |
| P2 | Full | 4 | 4 | 74.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |
| North: James Ruse Drive | | | | | | | | | | | | |
| P3 | Full | 13 | 14 | 74.2 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |
| West: Hassall Street | | | | | | | | | | | | |
| P4 | Full | 4 | 4 | 74.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |
| All Pedestrians | | 24 | 25 | 74.1 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# PHASING SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - PM (Site Folder: Existing 2025)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 160 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns**
**Input Phase Sequence: A, D, E, F, F1*, F2***
**Output Phase Sequence: A, D, E, F, F1***
**Reference Phase: Phase A**
(* Variable Phase)

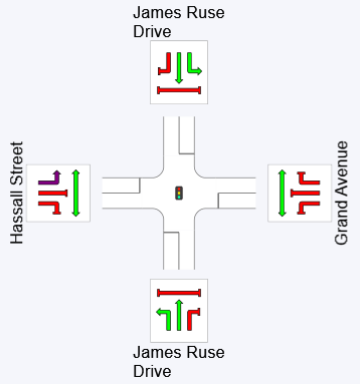
### Phase Timing Summary

| Phase | A | D | E | F | F1 |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 70 | 95 | 137 | 155 |
| Green Time (sec) | 64 | 19 | 36 | 12 | *** |
| Phase Time (sec) | 70 | 25 | 42 | 18 | 5 |
| Phase Split | 44% | 16% | 26% | 11% | 3% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

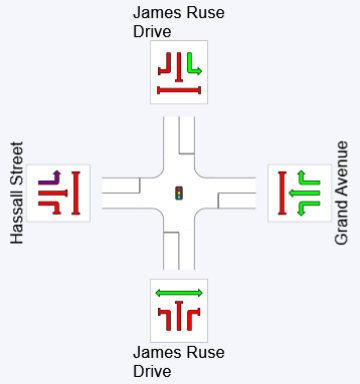
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence

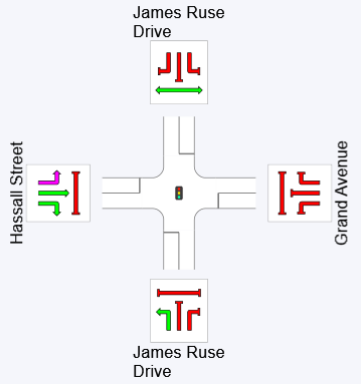
**Phase A** REF



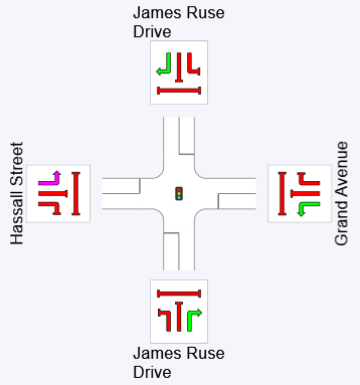

**Phase D**



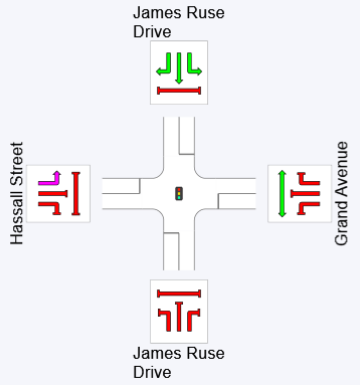

**Phase E**



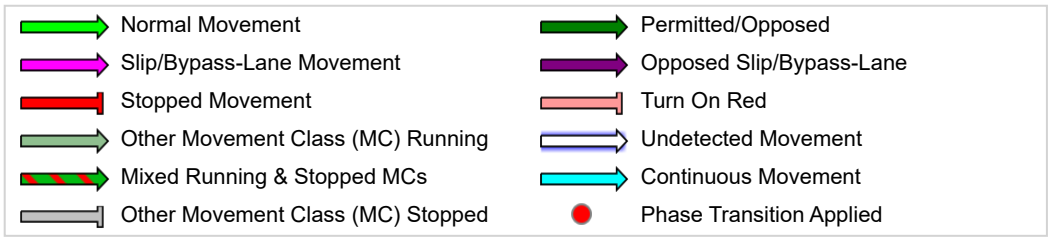

**Phase F**




**Phase F1** VAR



REF: Reference Phase
VAR: Variable Phase

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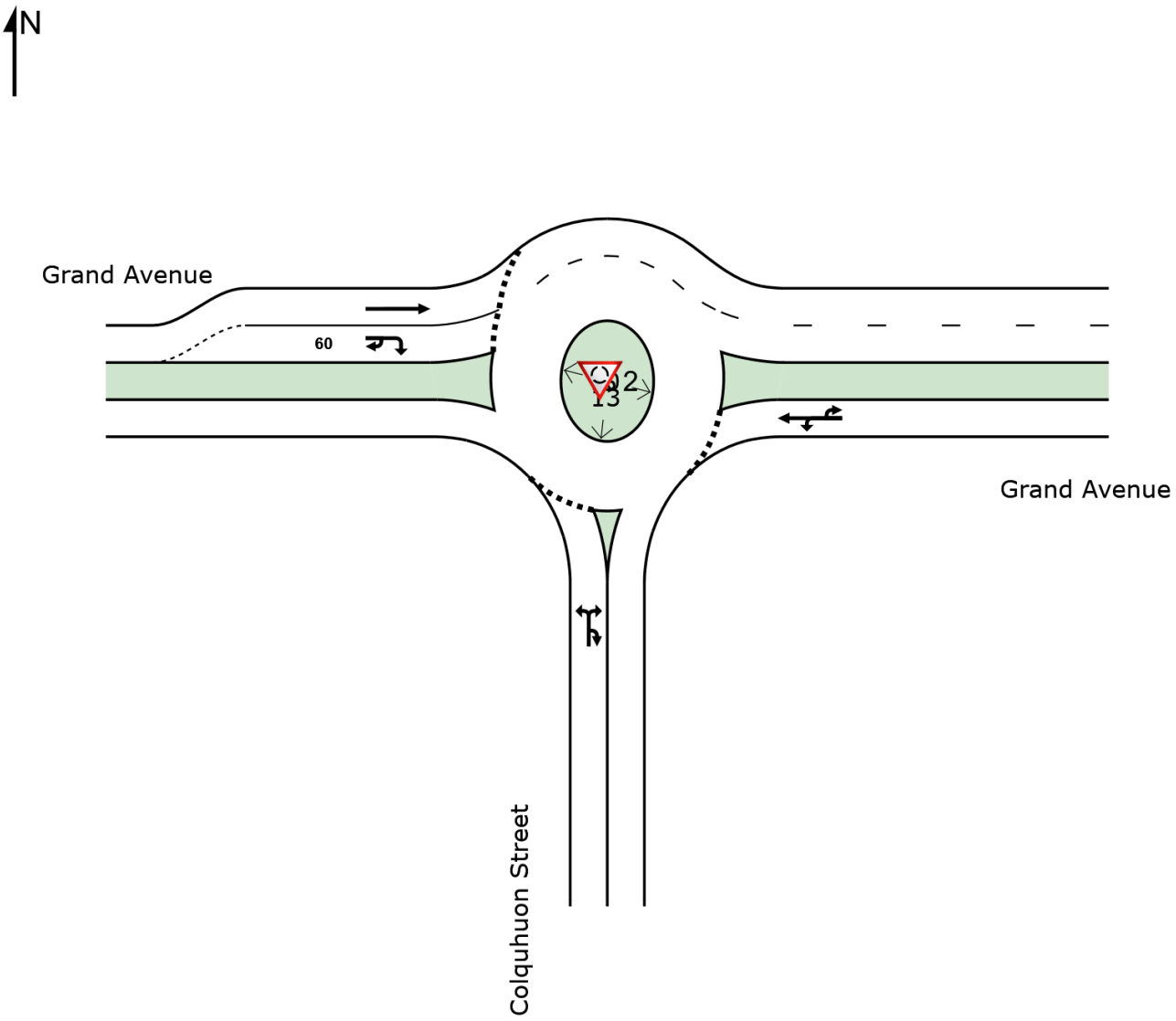
# SITE LAYOUT

## Site: 2 [Grand Avenue / Colquhuon Street - AM (Site Folder: Existing 2025)]

New Site
Site Category: (None)
Roundabout

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



# MOVEMENT SUMMARY

## Site: 2 [Grand Avenue / Colquhuon Street - AM (Site Folder: Existing 2025)]

**Output produced by SIDRA INTERSECTION Version: 9.1.1.200**

New Site
Site Category: (None)
Roundabout

**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: Colquhuon Street | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 100 | 50.5 | 100 | 50.5 | 0.176 | 5.9 | LOS A | 0.9 | 8.9 | 0.47 | 0.58 | 0.47 | 45.6 |
| 3 | R2 | All MCs | 34 | 15.6 | 34 | 15.6 | 0.176 | 8.7 | LOS A | 0.9 | 8.9 | 0.47 | 0.58 | 0.47 | 25.8 |
| 3u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.176 | 9.7 | LOS A | 0.9 | 8.9 | 0.47 | 0.58 | 0.47 | 44.6 |
| Approach | | | 135 | 41.4 | 135 | 41.4 | 0.176 | 6.7 | LOS A | 0.9 | 8.9 | 0.47 | 0.58 | 0.47 | 41.4 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 27 | 50.0 | 27 | 50.0 | 0.256 | 6.7 | LOS A | 1.4 | 15.0 | 0.46 | 0.53 | 0.46 | 40.8 |
| 5 | T1 | All MCs | 154 | 63.7 | 154 | 63.7 | 0.256 | 6.0 | LOS A | 1.4 | 15.0 | 0.46 | 0.53 | 0.46 | 44.2 |
| 6u | U | All MCs | 2 | 50.0 | 2 | 50.0 | 0.256 | 10.5 | LOS A | 1.4 | 15.0 | 0.46 | 0.53 | 0.46 | 13.5 |
| Approach | | | 183 | 61.5 | 183 | 61.5 | 0.256 | 6.2 | LOS A | 1.4 | 15.0 | 0.46 | 0.53 | 0.46 | 43.6 |
| West: Grand Avenue | | | | | | | | | | | | | | | |
| 11 | T1 | All MCs | 246 | 35.0 | 246 | 35.0 | 0.227 | 4.2 | LOS A | 1.4 | 12.5 | 0.20 | 0.40 | 0.20 | 45.2 |
| 12 | R2 | All MCs | 146 | 18.0 | 146 | 18.0 | 0.150 | 7.2 | LOS A | 0.8 | 6.8 | 0.19 | 0.58 | 0.19 | 45.2 |
| 12u | U | All MCs | 9 | 11.1 | 9 | 11.1 | 0.150 | 8.7 | LOS A | 0.8 | 6.8 | 0.19 | 0.58 | 0.19 | 46.1 |
| Approach | | | 402 | 28.3 | 402 | 28.3 | 0.227 | 5.4 | LOS A | 1.4 | 12.5 | 0.20 | 0.47 | 0.20 | 45.2 |
| All Vehicles | | | 720 | 39.2 | 720 | 39.2 | 0.256 | 5.8 | LOS A | 1.4 | 15.0 | 0.32 | 0.50 | 0.32 | 44.0 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout 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.

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# MOVEMENT SUMMARY

## Site: 2 [Grand Avenue / Colquhuon Street - PM (Site Folder: Existing 2025)]

**Output produced by SIDRA INTERSECTION Version: 9.1.1.200**

New Site
Site Category: (None)
Roundabout

**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: Colquhuon Street | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 43 | 7.3 | 43 | 7.3 | 0.050 | 4.5 | LOS A | 0.2 | 1.7 | 0.35 | 0.52 | 0.35 | 46.7 |
| 3 | R2 | All MCs | 5 | 0.0 | 5 | 0.0 | 0.050 | 8.0 | LOS A | 0.2 | 1.7 | 0.35 | 0.52 | 0.35 | 26.3 |
| 3u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.050 | 9.3 | LOS A | 0.2 | 1.7 | 0.35 | 0.52 | 0.35 | 45.5 |
| Approach | | | 49 | 6.4 | 49 | 6.4 | 0.050 | 4.9 | LOS A | 0.2 | 1.7 | 0.35 | 0.52 | 0.35 | 44.9 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 26 | 4.0 | 26 | 4.0 | 0.151 | 4.6 | LOS A | 0.8 | 5.8 | 0.10 | 0.42 | 0.10 | 43.4 |
| 5 | T1 | All MCs | 171 | 9.3 | 171 | 9.3 | 0.151 | 3.8 | LOS A | 0.8 | 5.8 | 0.10 | 0.42 | 0.10 | 46.0 |
| 6u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.151 | 8.4 | LOS A | 0.8 | 5.8 | 0.10 | 0.42 | 0.10 | 14.4 |
| Approach | | | 198 | 8.5 | 198 | 8.5 | 0.151 | 3.9 | LOS A | 0.8 | 5.8 | 0.10 | 0.42 | 0.10 | 45.6 |
| West: Grand Avenue | | | | | | | | | | | | | | | |
| 11 | T1 | All MCs | 12 | 18.2 | 12 | 18.2 | 0.011 | 3.7 | LOS A | 0.1 | 0.4 | 0.06 | 0.40 | 0.06 | 46.0 |
| 12 | R2 | All MCs | 14 | 15.4 | 14 | 15.4 | 0.013 | 6.9 | LOS A | 0.1 | 0.5 | 0.06 | 0.61 | 0.06 | 45.4 |
| 12u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.013 | 8.3 | LOS A | 0.1 | 0.5 | 0.06 | 0.61 | 0.06 | 46.4 |
| Approach | | | 26 | 16.0 | 26 | 16.0 | 0.013 | 5.5 | LOS A | 0.1 | 0.5 | 0.06 | 0.52 | 0.06 | 45.7 |
| All Vehicles | | | 274 | 8.8 | 274 | 8.8 | 0.151 | 4.3 | LOS A | 0.8 | 5.8 | 0.14 | 0.45 | 0.14 | 45.5 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout 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.

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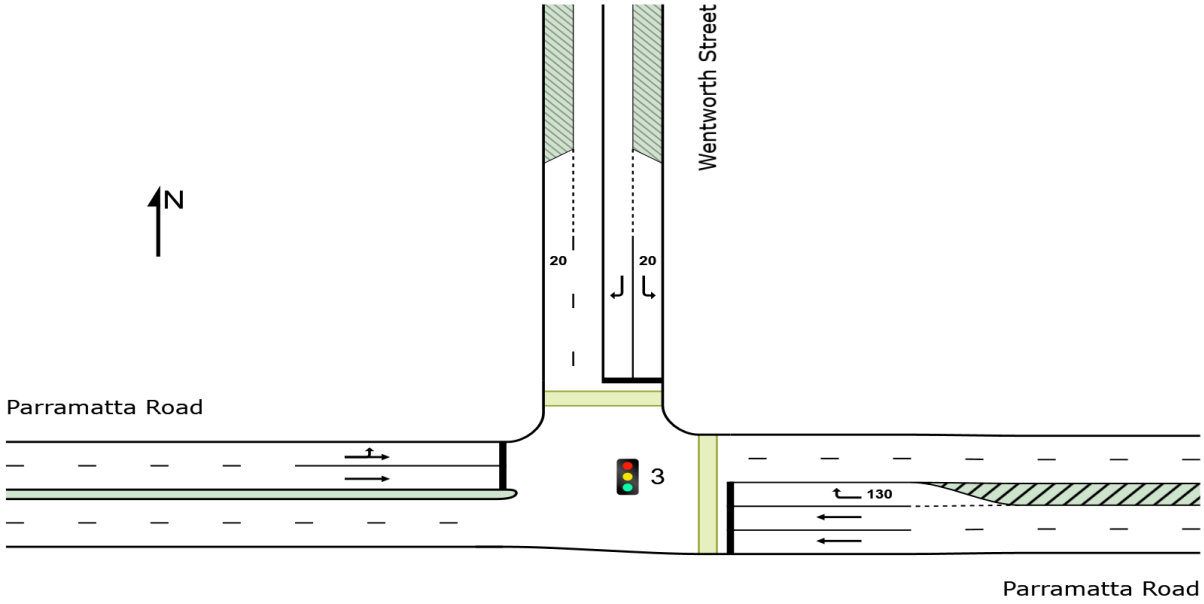
# SITE LAYOUT

## Site: 3 [Parramatta Road / Wentworth Street - AM (Site Folder: Existing 2025)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

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Organisation: STANTEC NEW ZEALAND | Licence: NETWORK / Enterprise Level 5 | Created: Thursday, August 7, 2025 10:04:30 AM
Project: U:\300305541\technical\modelling\sid_250722_5541_gpop_draft_model.sip9

# MOVEMENT SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - AM (Site Folder: Existing 2025)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 120 seconds (Site User-Given Cycle Time)

**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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | | | | |
| 5 | T1 | All MCs | 2065 | 9.2 | 2065 | 9.2 | 0.781 | 12.0 | LOS A | 38.0 | 286.9 | 0.69 | 0.63 | 0.69 | 49.5 |
| 6 | R2 | All MCs | 104 | 12.1 | 104 | 12.1 | * 0.610 | 43.0 | LOS D | 4.5 | 34.6 | 1.00 | 0.79 | 1.03 | 35.2 |
| Approach | | | 2169 | 9.3 | 2169 | 9.3 | 0.781 | 13.5 | LOS A | 38.0 | 286.9 | 0.71 | 0.64 | 0.71 | 47.5 |
| North: Wentworth Street | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 34 | 37.5 | 34 | 37.5 | 0.230 | 38.6 | LOS C | 1.4 | 12.7 | 0.95 | 0.72 | 0.95 | 35.3 |
| 9 | R2 | All MCs | 46 | 43.2 | 46 | 43.2 | 0.186 | 51.3 | LOS D | 2.4 | 22.6 | 0.89 | 0.74 | 0.89 | 23.9 |
| Approach | | | 80 | 40.8 | 80 | 40.8 | 0.230 | 45.9 | LOS D | 2.4 | 22.6 | 0.92 | 0.73 | 0.92 | 29.0 |
| West: Parramatta Road | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 83 | 17.7 | 83 | 17.7 | * 1.210 | 213.8 | LOS F | 147.5 | 1120.6 | 1.00 | 1.59 | 2.40 | 8.9 |
| 11 | T1 | All MCs | 2245 | 9.4 | 2245 | 9.4 | * 1.210 | 229.5 | LOS F | 148.3 | 1121.4 | 1.00 | 1.86 | 2.39 | 10.8 |
| Approach | | | 2328 | 9.7 | 2328 | 9.7 | 1.210 | 229.0 | LOS F | 148.3 | 1121.4 | 1.00 | 1.85 | 2.39 | 10.8 |
| All Vehicles | | | 4578 | 10.0 | 4578 | 10.0 | 1.210 | 123.7 | LOS F | 148.3 | 1121.4 | 0.86 | 1.26 | 1.57 | 17.4 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | |
| P2 | Full | 1 | 1 | 54.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 208.0 | 200.0 | 0.96 |
| North: Wentworth Street | | | | | | | | | | | | |
| P3 | Full | 12 | 13 | 54.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 208.0 | 200.0 | 0.96 |
| All Pedestrians | | 13 | 14 | 54.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 208.0 | 200.0 | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# PHASING SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - AM (Site Folder: Existing 2025)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 120 seconds (Site User-Given Cycle Time)

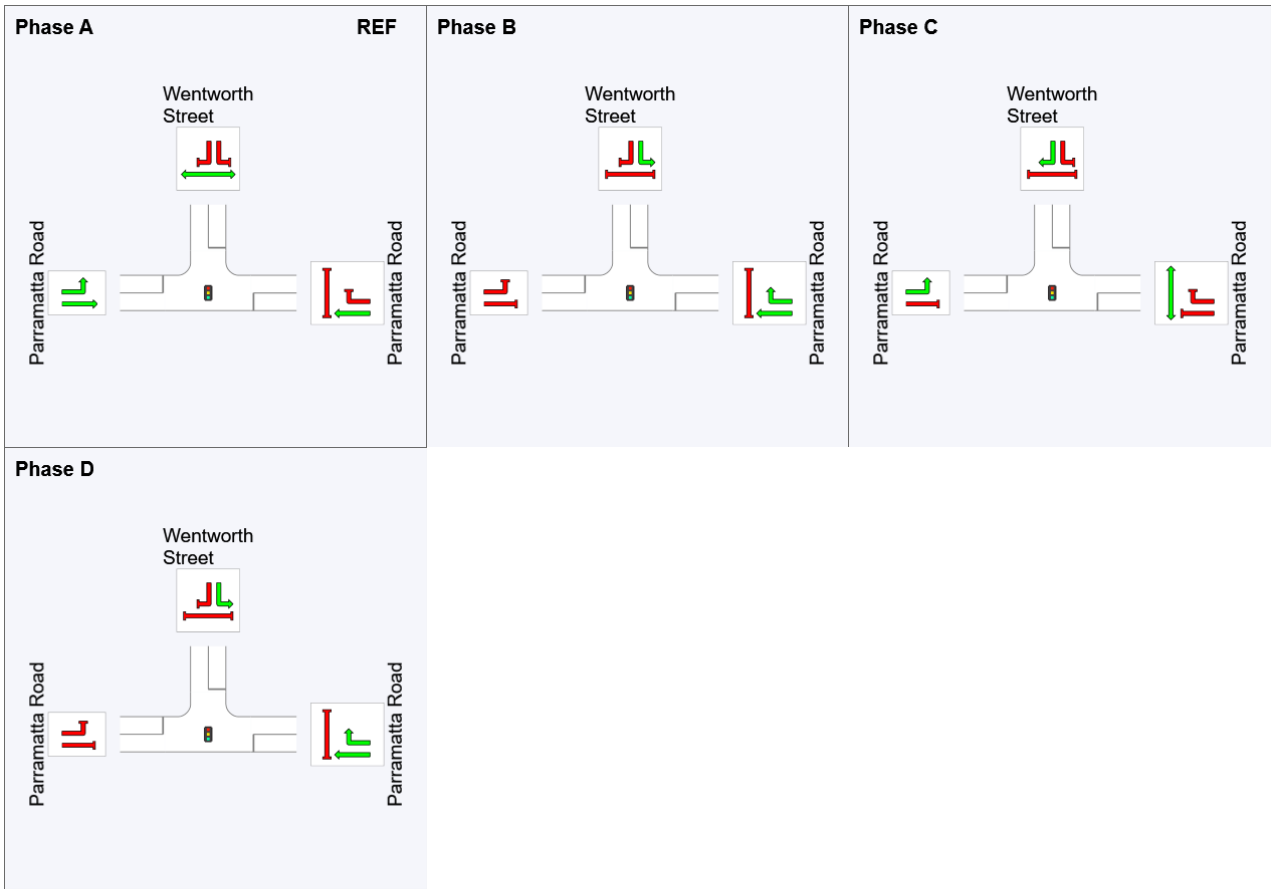
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns**
**Input Phase Sequence: A, B, C, D**
**Output Phase Sequence: A, B, C, D**
**Reference Phase: Phase A**

## Phase Timing Summary

| Phase | A | B | C | D |
|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 69 | 81 | 108 |
| Green Time (sec) | 63 | 6 | 21 | 6 |
| Phase Time (sec) | 69 | 12 | 27 | 12 |
| Phase Split | 58% | 10% | 23% | 10% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 |

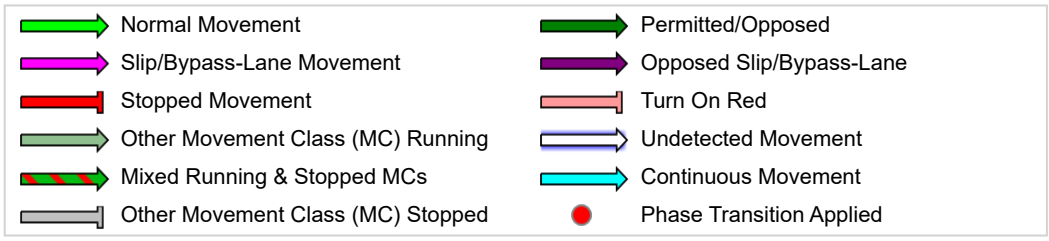
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence




REF: Reference Phase

VAR: Variable Phase

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# MOVEMENT SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - PM (Site Folder: Existing 2025)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 130 seconds (Site User-Given Cycle Time)

**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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | | | | |
| 5 | T1 | All MCs | 1789 | 4.6 | 1789 | 4.6 | 0.683 | 12.6 | LOS A | 32.5 | 236.2 | 0.64 | 0.58 | 0.64 | 48.5 |
| 6 | R2 | All MCs | 29 | 3.6 | 29 | 3.6 | 0.176 | 40.8 | LOS C | 1.2 | 8.8 | 0.95 | 0.71 | 0.95 | 35.5 |
| Approach | | | 1819 | 4.6 | 1819 | 4.6 | 0.683 | 13.1 | LOS A | 32.5 | 236.2 | 0.64 | 0.59 | 0.64 | 47.9 |
| North: Wentworth Street | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 57 | 1.9 | 57 | 1.9 | * 0.336 | 44.9 | LOS D | 2.4 | 17.1 | 0.97 | 0.74 | 0.97 | 35.3 |
| 9 | R2 | All MCs | 101 | 7.3 | 101 | 7.3 | 0.281 | 55.5 | LOS D | 5.4 | 40.0 | 0.88 | 0.77 | 0.88 | 25.0 |
| Approach | | | 158 | 5.3 | 158 | 5.3 | 0.336 | 51.7 | LOS D | 5.4 | 40.0 | 0.91 | 0.76 | 0.91 | 27.8 |
| West: Parramatta Road | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 43 | 7.3 | 43 | 7.3 | * 1.111 | 130.2 | LOS F | 118.1 | 847.0 | 1.00 | 1.35 | 1.83 | 12.3 |
| 11 | T1 | All MCs | 2118 | 2.6 | 2118 | 2.6 | * 1.111 | 150.0 | LOS F | 118.3 | 847.0 | 1.00 | 1.51 | 1.83 | 15.0 |
| Approach | | | 2161 | 2.7 | 2161 | 2.7 | 1.111 | 149.6 | LOS F | 118.3 | 847.0 | 1.00 | 1.51 | 1.83 | 14.9 |
| All Vehicles | | | 4138 | 3.6 | 4138 | 3.6 | 1.111 | 85.8 | LOS F | 118.3 | 847.0 | 0.84 | 1.07 | 1.27 | 22.0 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | |
| P2 | Full | 1 | 1 | 59.1 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 213.0 | 200.0 | 0.94 |
| North: Wentworth Street | | | | | | | | | | | | |
| P3 | Full | 12 | 13 | 59.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 213.0 | 200.0 | 0.94 |
| All Pedestrians | | 13 | 14 | 59.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 213.0 | 200.0 | 0.94 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# PHASING SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - PM (Site Folder: Existing 2025)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 130 seconds (Site User-Given Cycle Time)

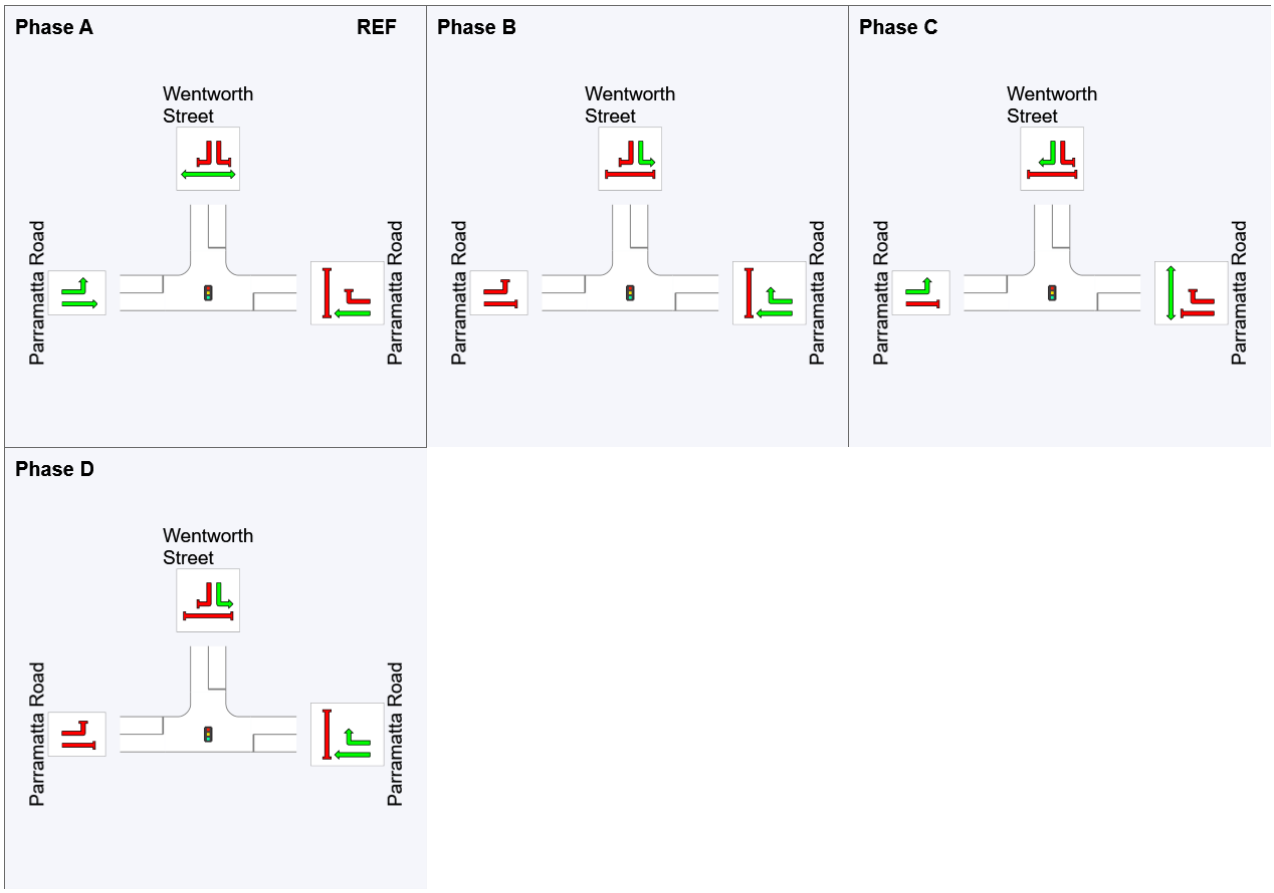
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns**
**Input Phase Sequence: A, B, C, D**
**Output Phase Sequence: A, B, C, D**
**Reference Phase: Phase A**

## Phase Timing Summary

| Phase | A | B | C | D |
|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 72 | 84 | 118 |
| Green Time (sec) | 66 | 6 | 28 | 6 |
| Phase Time (sec) | 72 | 12 | 34 | 12 |
| Phase Split | 55% | 9% | 26% | 9% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 |

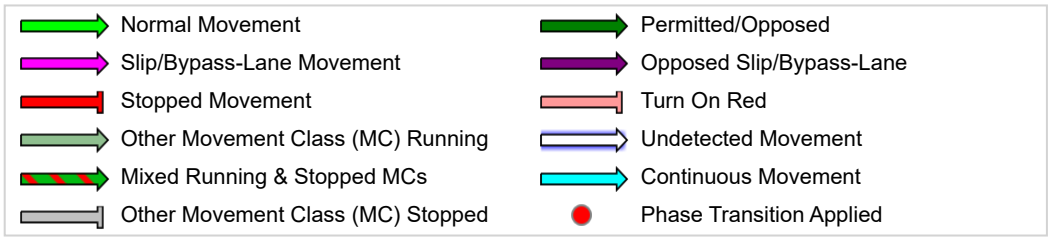
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence




REF: Reference Phase

VAR: Variable Phase

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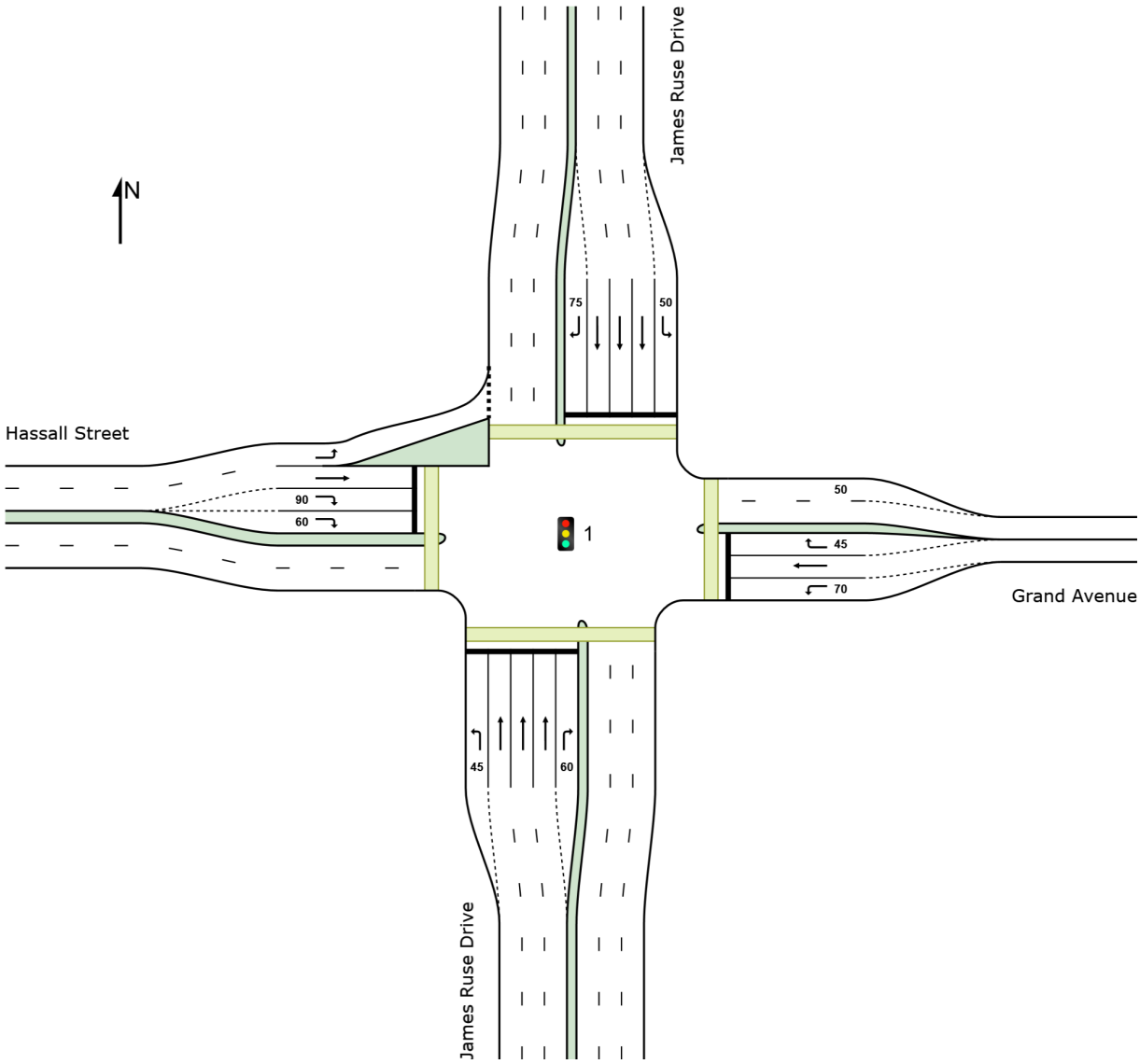
# Appendix B. Future Case Scenarios (2028) - SIDRA INTERSECTION Modelling Results

# SITE LAYOUT

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - AM (Site Folder: Future 2028)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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

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# MOVEMENT SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - AM (Site Folder: Future 2028)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**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: James Ruse Drive | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 319 | 4.6 | 319 | 4.6 | 0.289 | 41.3 | LOS C | 6.3 | 45.9 | 0.50 | 0.74 | 0.50 | 47.1 |
| 2 | T1 | All MCs | 2341 | 7.5 | 2341 | 7.5 | * 1.001 | 104.0 | LOS F | 88.5 | 659.3 | 1.00 | 1.26 | 1.33 | 41.8 |
| 3 | R2 | All MCs | 155 | 51.7 | 155 | 51.7 | * 1.012 | 161.3 | LOS F | 15.9 | 160.5 | 1.00 | 1.14 | 1.64 | 21.6 |
| Approach | | | 2815 | 9.6 | 2815 | 9.6 | 1.012 | 100.0 | LOS F | 88.5 | 659.3 | 0.94 | 1.20 | 1.26 | 37.3 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 152 | 65.3 | 152 | 65.3 | * 0.544 | 41.6 | LOS C | 7.8 | 84.8 | 0.93 | 0.80 | 0.93 | 31.8 |
| 5 | T1 | All MCs | 42 | 32.5 | 42 | 32.5 | 0.327 | 73.0 | LOS F | 3.0 | 27.1 | 0.98 | 0.73 | 0.98 | 25.4 |
| 6 | R2 | All MCs | 108 | 40.8 | 108 | 40.8 | 0.942 | 102.7 | LOS F | 9.6 | 90.6 | 1.00 | 1.10 | 1.48 | 37.5 |
| Approach | | | 302 | 51.9 | 302 | 51.9 | 0.942 | 67.9 | LOS E | 9.6 | 90.6 | 0.96 | 0.90 | 1.14 | 34.0 |
| North: James Ruse Drive | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 220 | 12.4 | 220 | 12.4 | 0.210 | 45.0 | LOS D | 7.0 | 54.0 | 0.47 | 0.73 | 0.47 | 55.3 |
| 8 | T1 | All MCs | 2272 | 5.6 | 2272 | 5.6 | 0.920 | 66.4 | LOS E | 64.7 | 474.8 | 1.00 | 1.02 | 1.12 | 49.9 |
| 9 | R2 | All MCs | 164 | 9.6 | 164 | 9.6 | 0.675 | 96.0 | LOS F | 11.7 | 88.9 | 1.00 | 0.83 | 1.02 | 41.5 |
| Approach | | | 2656 | 6.4 | 2656 | 6.4 | 0.920 | 66.4 | LOS E | 64.7 | 474.8 | 0.96 | 0.98 | 1.06 | 45.9 |
| West: Hassall Street | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 597 | 4.9 | 597 | 4.9 | 0.917 | 72.8 | LOS F | 40.7 | 296.8 | 1.00 | 1.14 | 1.16 | 34.8 |
| 11 | T1 | All MCs | 223 | 9.4 | 223 | 9.4 | 0.959 | 97.3 | LOS F | 19.9 | 150.8 | 1.00 | 1.10 | 1.41 | 24.8 |
| 12 | R2 | All MCs | 406 | 8.5 | 406 | 8.5 | * 0.963 | 109.2 | LOS F | 18.4 | 138.4 | 1.00 | 1.06 | 1.44 | 17.6 |
| Approach | | | 1226 | 7.0 | 1226 | 7.0 | 0.963 | 89.3 | LOS F | 40.7 | 296.8 | 1.00 | 1.10 | 1.30 | 28.7 |
| All Vehicles | | | 6999 | 9.8 | 6999 | 9.8 | 1.012 | 84.0 | LOS F | 88.5 | 659.3 | 0.96 | 1.09 | 1.18 | 39.0 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: James Ruse Drive | | | | | | | | | | | | |
| P1 | Full | 6 | 6 | 69.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Grand Avenue | | | | | | | | | | | |
| P2 | Full | 1 | 1 | 69.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |
| North: James Ruse Drive | | | | | | | | | | | |
| P3 | Full | 6 | 6 | 69.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |
| West: Hassall Street | | | | | | | | | | | |
| P4 | Full | 13 | 14 | 69.2 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |
| All Pedestrians | | 26 | 27 | 69.1 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# PHASING SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - AM (Site Folder: Future 2028)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns**
**Input Phase Sequence: A, D, E, F, F1*, F2***
**Output Phase Sequence: A, D, E, F**
**Reference Phase: Phase A**
(* Variable Phase)

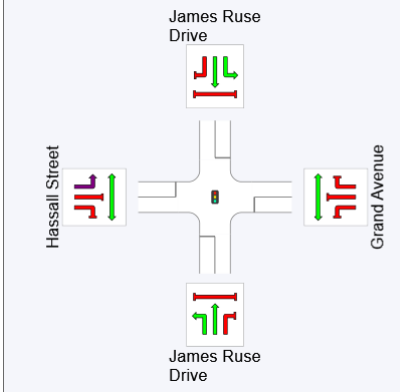
### Phase Timing Summary

| Phase | A | D | E | F |
|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 80 | 98 | 123 |
| Green Time (sec) | 74 | 12 | 19 | 21 |
| Phase Time (sec) | 80 | 18 | 25 | 27 |
| Phase Split | 53% | 12% | 17% | 18% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 |

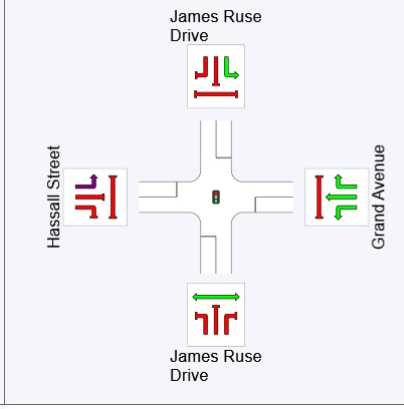
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence

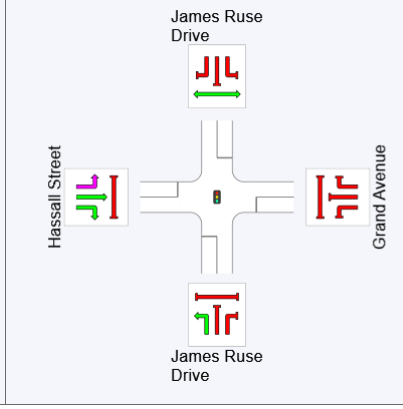
**Phase A** **REF**



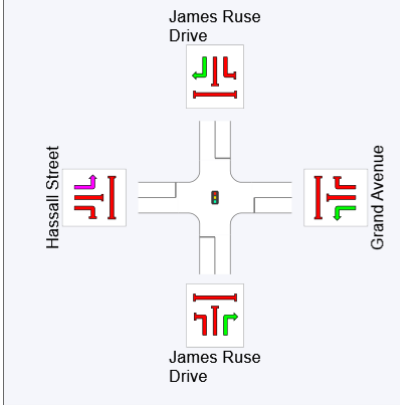

**Phase D**



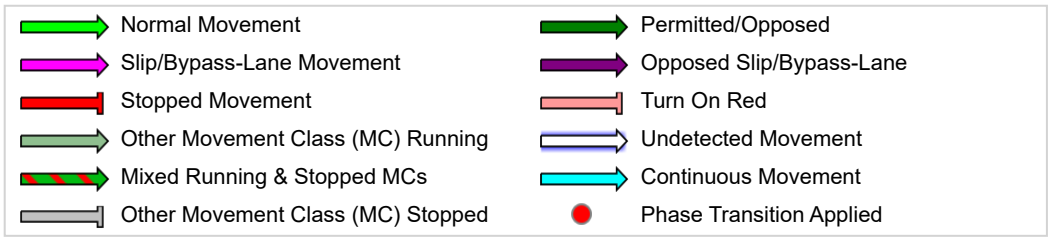

**Phase E**




**Phase F**



REF: Reference Phase
VAR: Variable Phase

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# MOVEMENT SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - AM (Plus Construction) (Site Folder: Future 2028 + Construction)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**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: James Ruse Drive | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 319 | 4.6 | 319 | 4.6 | 0.299 | 43.4 | LOS D | 6.9 | 50.0 | 0.53 | 0.74 | 0.53 | 46.3 |
| 2 | T1 | All MCs | 2341 | 7.5 | 2341 | 7.5 | * 1.034 | 125.8 | LOS F | 94.5 | 704.1 | 1.00 | 1.36 | 1.45 | 38.1 |
| 3 | R2 | All MCs | 174 | 48.5 | 174 | 48.5 | * 1.064 | 194.5 | LOS F | 19.5 | 193.0 | 1.00 | 1.22 | 1.80 | 18.8 |
| Approach | | | 2834 | 9.7 | 2834 | 9.7 | 1.064 | 120.7 | LOS F | 94.5 | 704.1 | 0.95 | 1.28 | 1.37 | 34.0 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 156 | 66.2 | 156 | 66.2 | * 0.515 | 40.1 | LOS C | 7.8 | 86.0 | 0.91 | 0.79 | 0.91 | 32.1 |
| 5 | T1 | All MCs | 42 | 32.5 | 42 | 32.5 | 0.327 | 73.0 | LOS F | 3.0 | 27.1 | 0.98 | 0.73 | 0.98 | 25.4 |
| 6 | R2 | All MCs | 113 | 43.0 | 113 | 43.0 | 0.990 | 119.7 | LOS F | 10.8 | 103.9 | 1.00 | 1.17 | 1.61 | 35.2 |
| Approach | | | 311 | 53.2 | 311 | 53.2 | 0.990 | 73.4 | LOS F | 10.8 | 103.9 | 0.95 | 0.92 | 1.18 | 33.1 |
| North: James Ruse Drive | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 239 | 13.2 | 239 | 13.2 | 0.235 | 47.6 | LOS D | 7.9 | 61.9 | 0.50 | 0.73 | 0.50 | 54.8 |
| 8 | T1 | All MCs | 2272 | 5.6 | 2272 | 5.6 | 0.954 | 80.0 | LOS F | 72.0 | 528.3 | 1.00 | 1.11 | 1.20 | 46.7 |
| 9 | R2 | All MCs | 164 | 9.6 | 164 | 9.6 | 0.591 | 93.8 | LOS F | 11.3 | 85.8 | 0.98 | 0.82 | 0.98 | 42.4 |
| Approach | | | 2675 | 6.5 | 2675 | 6.5 | 0.954 | 77.9 | LOS F | 72.0 | 528.3 | 0.95 | 1.06 | 1.12 | 43.4 |
| West: Hassall Street | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 597 | 4.9 | 597 | 4.9 | 0.891 | 66.0 | LOS E | 38.4 | 279.8 | 1.00 | 1.11 | 1.11 | 35.9 |
| 11 | T1 | All MCs | 223 | 9.4 | 223 | 9.4 | * 1.012 | 121.1 | LOS F | 22.0 | 166.7 | 1.00 | 1.18 | 1.57 | 21.4 |
| 12 | R2 | All MCs | 406 | 8.5 | 406 | 8.5 | 1.011 | 131.6 | LOS F | 20.2 | 151.5 | 1.00 | 1.12 | 1.58 | 15.3 |
| Approach | | | 1226 | 7.0 | 1226 | 7.0 | 1.012 | 97.8 | LOS F | 38.4 | 279.8 | 1.00 | 1.13 | 1.35 | 27.5 |
| All Vehicles | | | 7045 | 9.9 | 7045 | 9.9 | 1.064 | 98.4 | LOS F | 94.5 | 704.1 | 0.96 | 1.15 | 1.26 | 36.4 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: James Ruse Drive | | | | | | | | | | | | |
| P1 | Full | 6 | 6 | 69.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Grand Avenue | | | | | | | | | | | |
| P2 | Full | 1 | 1 | 69.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |
| North: James Ruse Drive | | | | | | | | | | | |
| P3 | Full | 6 | 6 | 69.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |
| West: Hassall Street | | | | | | | | | | | |
| P4 | Full | 13 | 14 | 69.2 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |
| All Pedestrians | | 26 | 27 | 69.1 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 223.0 | 200.0 | 0.90 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# PHASING SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - AM (Plus Construction) (Site Folder: Future 2028 + Construction)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 150 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns - Import**
**Input Phase Sequence: A, D, E, F, F1*, F2***
**Output Phase Sequence: A, D, E, F**
**Reference Phase: Phase A**
(* Variable Phase)

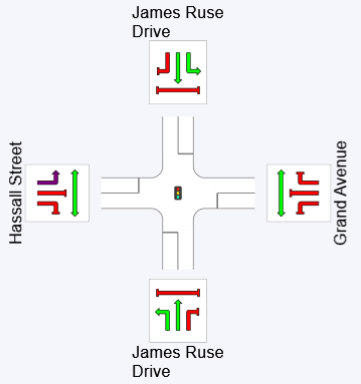
### Phase Timing Summary

| Phase | A | D | E | F |
|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 78 | 96 | 120 |
| Green Time (sec) | 72 | 12 | 18 | 24 |
| Phase Time (sec) | 78 | 18 | 24 | 30 |
| Phase Split | 52% | 12% | 16% | 20% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 |

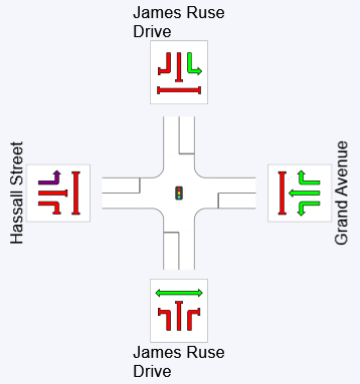
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence

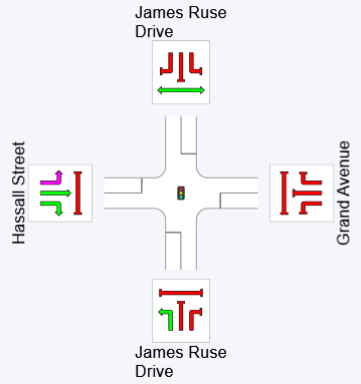
**Phase A** **REF**



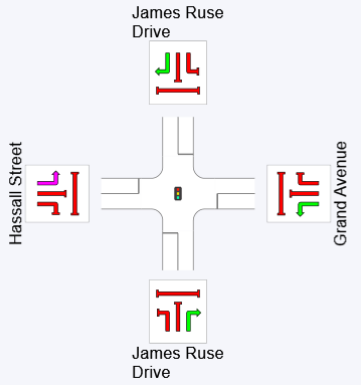

**Phase D**



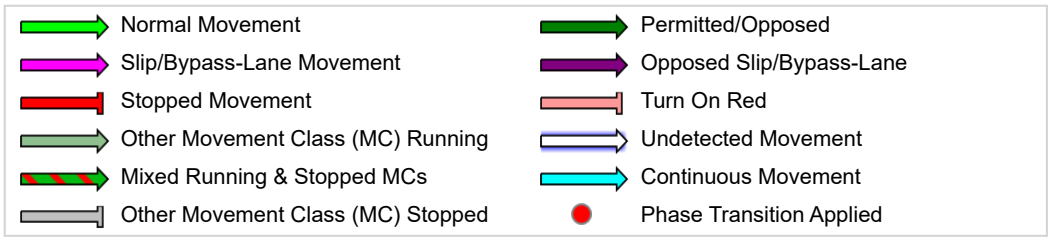

**Phase E**




**Phase F**



REF: Reference Phase
VAR: Variable Phase

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# MOVEMENT SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - PM (Site Folder: Future 2028)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 160 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**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: James Ruse Drive | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 257 | 4.1 | 257 | 4.1 | 0.228 | 49.8 | LOS D | 4.5 | 32.9 | 0.47 | 0.72 | 0.47 | 47.6 |
| 2 | T1 | All MCs | 2243 | 2.3 | 2243 | 2.3 | * 1.109 | 194.2 | LOS F | 103.9 | 741.4 | 1.00 | 1.55 | 1.70 | 30.1 |
| 3 | R2 | All MCs | 124 | 22.0 | 124 | 22.0 | 1.032 | 183.7 | LOS F | 13.3 | 110.6 | 1.00 | 1.11 | 1.68 | 20.3 |
| Approach | | | 2624 | 3.4 | 2624 | 3.4 | 1.109 | 179.5 | LOS F | 103.9 | 741.4 | 0.95 | 1.45 | 1.58 | 27.6 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 299 | 10.2 | 299 | 10.2 | 0.891 | 54.2 | LOS D | 17.3 | 131.8 | 1.00 | 0.94 | 1.20 | 32.6 |
| 5 | T1 | All MCs | 92 | 2.3 | 92 | 2.3 | 0.401 | 94.1 | LOS F | 6.7 | 47.9 | 0.97 | 0.76 | 0.97 | 26.1 |
| 6 | R2 | All MCs | 208 | 3.5 | 208 | 3.5 | * 1.079 | 198.7 | LOS F | 24.2 | 174.5 | 1.00 | 1.30 | 1.75 | 29.8 |
| Approach | | | 599 | 6.7 | 599 | 6.7 | 1.079 | 110.6 | LOS F | 24.2 | 174.5 | 1.00 | 1.04 | 1.36 | 28.8 |
| North: James Ruse Drive | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 76 | 2.8 | 76 | 2.8 | 0.071 | 57.4 | LOS E | 2.5 | 17.7 | 0.45 | 0.70 | 0.45 | 55.0 |
| 8 | T1 | All MCs | 2313 | 3.2 | 2313 | 3.2 | 1.020 | 125.3 | LOS F | 87.7 | 630.9 | 1.00 | 1.29 | 1.37 | 38.8 |
| 9 | R2 | All MCs | 215 | 3.4 | 215 | 3.4 | * 1.115 | 234.4 | LOS F | 26.4 | 190.5 | 1.00 | 1.23 | 1.87 | 24.7 |
| Approach | | | 2603 | 3.2 | 2603 | 3.2 | 1.115 | 132.3 | LOS F | 87.7 | 630.9 | 0.98 | 1.27 | 1.39 | 34.5 |
| West: Hassall Street | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 522 | 1.8 | 522 | 1.8 | 0.681 | 48.9 | LOS D | 26.3 | 187.2 | 0.87 | 1.00 | 0.87 | 38.9 |
| 11 | T1 | All MCs | 55 | 3.8 | 55 | 3.8 | 0.128 | 55.5 | LOS D | 3.4 | 24.4 | 0.83 | 0.64 | 0.83 | 35.1 |
| 12 | R2 | All MCs | 661 | 2.7 | 661 | 2.7 | * 1.105 | 218.1 | LOS F | 40.8 | 292.5 | 1.00 | 1.27 | 1.79 | 11.2 |
| Approach | | | 1238 | 2.4 | 1238 | 2.4 | 1.105 | 139.6 | LOS F | 40.8 | 292.5 | 0.94 | 1.13 | 1.36 | 21.5 |
| All Vehicles | | | 7064 | 3.4 | 7064 | 3.4 | 1.115 | 149.3 | LOS F | 103.9 | 741.4 | 0.96 | 1.29 | 1.45 | 29.3 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: James Ruse Drive | | | | | | | | | | | | |
| P1 | Full | 3 | 3 | 74.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Grand Avenue | | | | | | | | | | | | |
| P2 | Full | 4 | 4 | 74.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |
| North: James Ruse Drive | | | | | | | | | | | | |
| P3 | Full | 13 | 14 | 74.2 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |
| West: Hassall Street | | | | | | | | | | | | |
| P4 | Full | 4 | 4 | 74.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |
| All Pedestrians | | 24 | 25 | 74.1 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# PHASING SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - PM (Site Folder: Future 2028)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 160 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns**
**Input Phase Sequence: A, D, E, F, F1*, F2***
**Output Phase Sequence: A, D, E, F, F1***
**Reference Phase: Phase A**
(* Variable Phase)

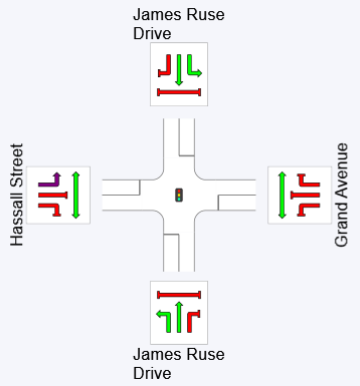
## Phase Timing Summary

| Phase | A | D | E | F | F1 |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 70 | 95 | 137 | 155 |
| Green Time (sec) | 64 | 19 | 36 | 12 | *** |
| Phase Time (sec) | 70 | 25 | 42 | 18 | 5 |
| Phase Split | 44% | 16% | 26% | 11% | 3% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

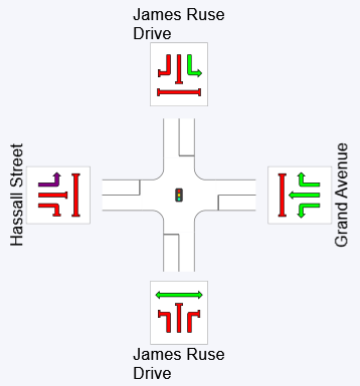
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

## Output Phase Sequence

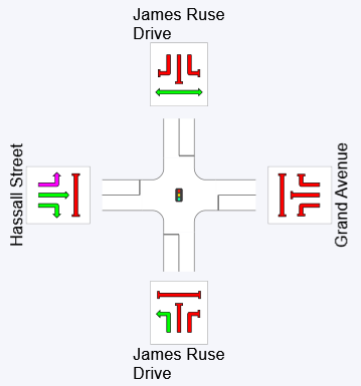
**Phase A** REF



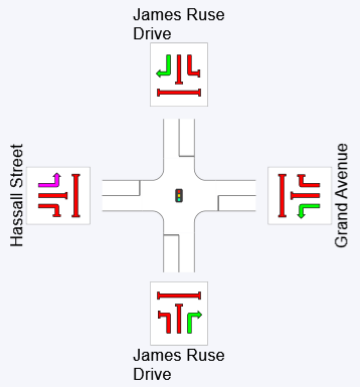

**Phase D**



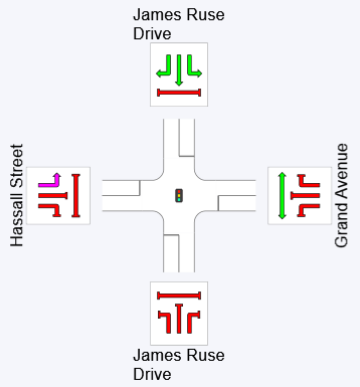

**Phase E**



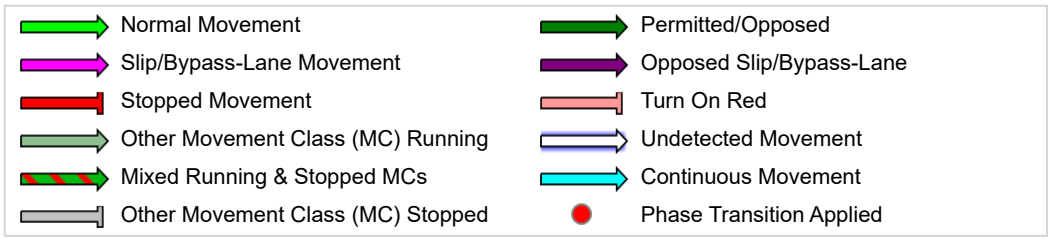

**Phase F**




**Phase F1** VAR



REF: Reference Phase
VAR: Variable Phase

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# MOVEMENT SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - PM (Plus Construction) (Site Folder: Future 2028 + Construction)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 160 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**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: James Ruse Drive | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 257 | 4.1 | 257 | 4.1 | 0.230 | 50.1 | LOS D | 4.7 | 34.0 | 0.47 | 0.72 | 0.47 | 47.4 |
| 2 | T1 | All MCs | 2243 | 2.3 | 2243 | 2.3 | * 1.111 | 195.9 | LOS F | 104.5 | 745.7 | 1.00 | 1.56 | 1.71 | 29.9 |
| 3 | R2 | All MCs | 128 | 24.6 | 128 | 24.6 | 1.000 | 165.8 | LOS F | 13.2 | 111.7 | 1.00 | 1.08 | 1.58 | 22.0 |
| Approach | | | 2628 | 3.6 | 2628 | 3.6 | 1.111 | 180.2 | LOS F | 104.5 | 745.7 | 0.95 | 1.45 | 1.59 | 27.5 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 314 | 10.7 | 314 | 10.7 | 0.882 | 52.2 | LOS D | 17.9 | 136.7 | 1.00 | 0.93 | 1.18 | 33.2 |
| 5 | T1 | All MCs | 92 | 2.3 | 92 | 2.3 | 0.381 | 96.5 | LOS F | 6.7 | 47.5 | 0.96 | 0.76 | 0.96 | 26.3 |
| 6 | R2 | All MCs | 223 | 4.7 | 223 | 4.7 | * 1.111 | 227.1 | LOS F | 27.4 | 199.7 | 1.00 | 1.35 | 1.85 | 27.8 |
| Approach | | | 628 | 7.4 | 628 | 7.4 | 1.111 | 120.8 | LOS F | 27.4 | 199.7 | 0.99 | 1.05 | 1.38 | 27.7 |
| North: James Ruse Drive | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 80 | 7.9 | 80 | 7.9 | 0.077 | 58.0 | LOS E | 2.6 | 19.6 | 0.46 | 0.70 | 0.46 | 54.8 |
| 8 | T1 | All MCs | 2313 | 3.2 | 2313 | 3.2 | 1.038 | 137.5 | LOS F | 90.7 | 652.3 | 1.00 | 1.34 | 1.44 | 36.9 |
| 9 | R2 | All MCs | 215 | 3.4 | 215 | 3.4 | * 1.115 | 235.0 | LOS F | 26.4 | 190.5 | 1.00 | 1.23 | 1.87 | 24.7 |
| Approach | | | 2607 | 3.4 | 2607 | 3.4 | 1.115 | 143.1 | LOS F | 90.7 | 652.3 | 0.98 | 1.31 | 1.44 | 33.1 |
| West: Hassall Street | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 522 | 1.8 | 522 | 1.8 | 0.692 | 49.9 | LOS D | 26.6 | 189.2 | 0.88 | 1.01 | 0.88 | 38.7 |
| 11 | T1 | All MCs | 56 | 5.7 | 56 | 5.7 | 0.136 | 57.5 | LOS E | 3.5 | 25.5 | 0.84 | 0.65 | 0.84 | 34.8 |
| 12 | R2 | All MCs | 661 | 2.7 | 661 | 2.7 | * 1.126 | 235.7 | LOS F | 42.2 | 302.3 | 1.00 | 1.30 | 1.87 | 10.4 |
| Approach | | | 1239 | 2.5 | 1239 | 2.5 | 1.126 | 149.4 | LOS F | 42.2 | 302.3 | 0.94 | 1.15 | 1.41 | 20.6 |
| All Vehicles | | | 7103 | 3.6 | 7103 | 3.6 | 1.126 | 155.9 | LOS F | 104.5 | 745.7 | 0.96 | 1.31 | 1.48 | 28.5 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: James Ruse Drive | | | | | | | | | | | | |
| P1 | Full | 3 | 3 | 74.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Grand Avenue | | | | | | | | | | | | |
| P2 | Full | 4 | 4 | 74.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |
| North: James Ruse Drive | | | | | | | | | | | | |
| P3 | Full | 13 | 14 | 74.2 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |
| West: Hassall Street | | | | | | | | | | | | |
| P4 | Full | 4 | 4 | 74.1 | LOS F | 0.0 | 0.0 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |
| All Pedestrians | | 24 | 25 | 74.1 | LOS F | 0.1 | 0.1 | 0.96 | 0.96 | 228.0 | 200.0 | 0.88 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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# PHASING SUMMARY

## Site: 1 [Grand Avenue / James Ruse Drive / Hassall Street - PM (Plus Construction) (Site Folder: Future 2028 + Construction)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 160 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns**
**Input Phase Sequence: A, D, E, F, F1*, F2***
**Output Phase Sequence: A, D, E, F, F1***
**Reference Phase: Phase A**
(* Variable Phase)

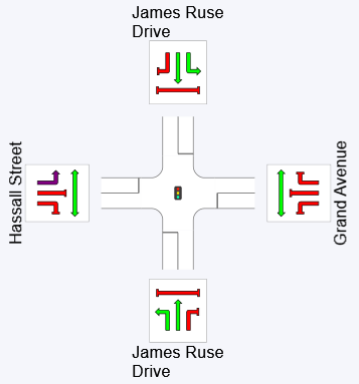
### Phase Timing Summary

| Phase | A | D | E | F | F1 |
|---|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 70 | 96 | 137 | 156 |
| Green Time (sec) | 64 | 20 | 35 | 13 | *** |
| Phase Time (sec) | 70 | 26 | 41 | 19 | 4 |
| Phase Split | 44% | 16% | 26% | 12% | 3% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

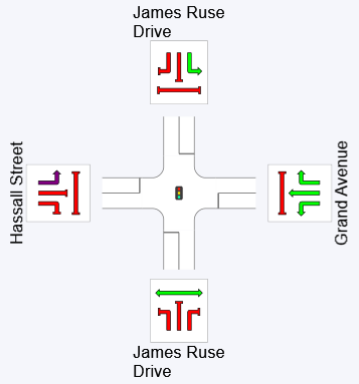
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence

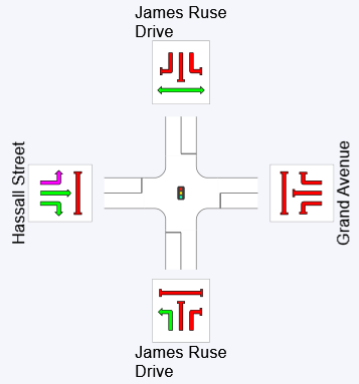
**Phase A** REF



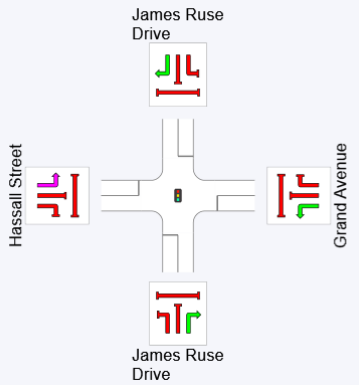

**Phase D**



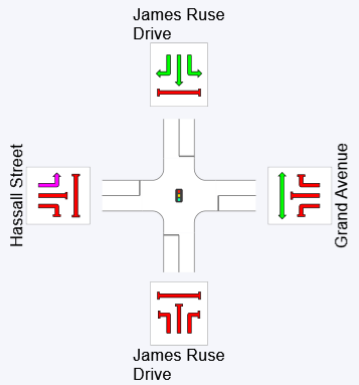

**Phase E**



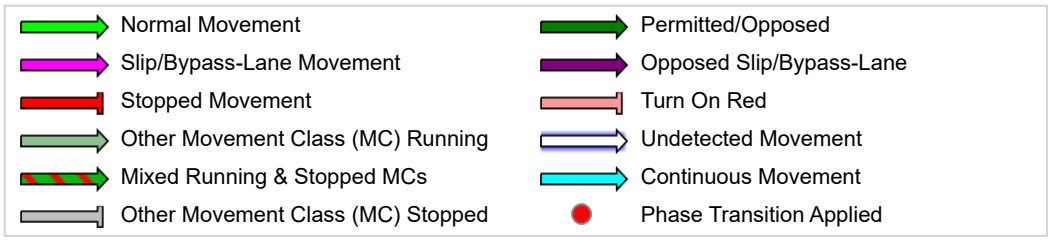

**Phase F**




**Phase F1** VAR



REF: Reference Phase
VAR: Variable Phase

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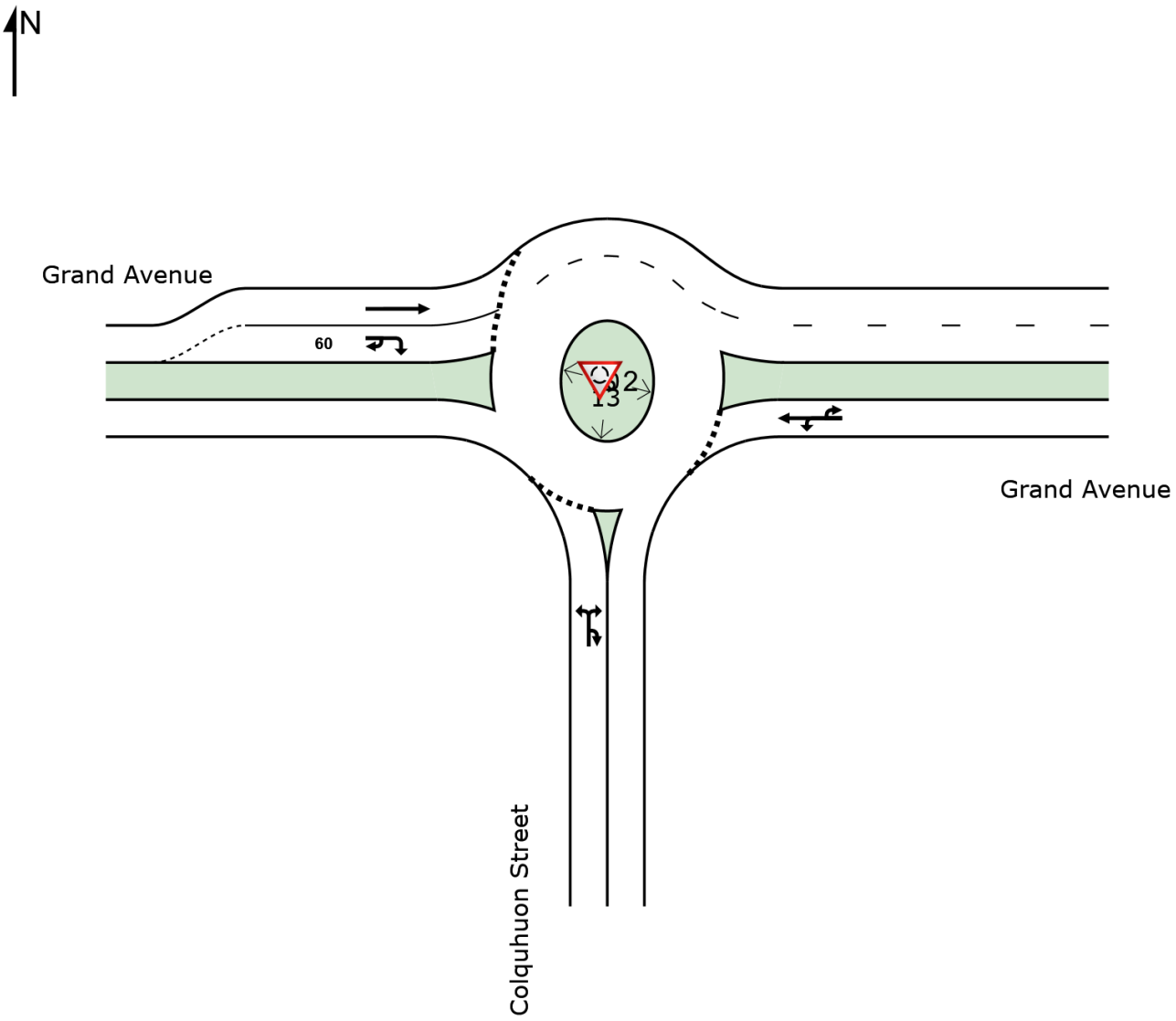
# SITE LAYOUT

## Site: 2 [Grand Avenue / Colquhuon Street - AM (Site Folder: Future 2028)]

New Site
Site Category: (None)
Roundabout

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



# MOVEMENT SUMMARY

## Site: 2 [Grand Avenue / Colquhuon Street - AM (Site Folder: Future 2028)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Roundabout

**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: Colquhuon Street | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 104 | 50.5 | 104 | 50.5 | 0.185 | 6.0 | LOS A | 1.0 | 9.4 | 0.48 | 0.58 | 0.48 | 45.6 |
| 3 | R2 | All MCs | 35 | 15.2 | 35 | 15.2 | 0.185 | 8.8 | LOS A | 1.0 | 9.4 | 0.48 | 0.58 | 0.48 | 25.7 |
| 3u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.185 | 9.8 | LOS A | 1.0 | 9.4 | 0.48 | 0.58 | 0.48 | 44.6 |
| Approach | | | 140 | 41.4 | 140 | 41.4 | 0.185 | 6.8 | LOS A | 1.0 | 9.4 | 0.48 | 0.58 | 0.48 | 41.4 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 29 | 50.0 | 29 | 50.0 | 0.270 | 6.8 | LOS A | 1.5 | 16.0 | 0.47 | 0.53 | 0.47 | 40.7 |
| 5 | T1 | All MCs | 160 | 63.8 | 160 | 63.8 | 0.270 | 6.2 | LOS A | 1.5 | 16.0 | 0.47 | 0.53 | 0.47 | 44.2 |
| 6u | U | All MCs | 2 | 50.0 | 2 | 50.0 | 0.270 | 10.7 | LOS A | 1.5 | 16.0 | 0.47 | 0.53 | 0.47 | 13.5 |
| Approach | | | 192 | 61.5 | 192 | 61.5 | 0.270 | 6.3 | LOS A | 1.5 | 16.0 | 0.47 | 0.53 | 0.47 | 43.6 |
| West: Grand Avenue | | | | | | | | | | | | | | | |
| 11 | T1 | All MCs | 258 | 35.1 | 258 | 35.1 | 0.238 | 4.2 | LOS A | 1.5 | 13.3 | 0.21 | 0.40 | 0.21 | 45.2 |
| 12 | R2 | All MCs | 153 | 17.9 | 153 | 17.9 | 0.157 | 7.2 | LOS A | 0.9 | 7.1 | 0.20 | 0.58 | 0.20 | 45.2 |
| 12u | U | All MCs | 9 | 11.1 | 9 | 11.1 | 0.157 | 8.7 | LOS A | 0.9 | 7.1 | 0.20 | 0.58 | 0.20 | 46.1 |
| Approach | | | 420 | 28.3 | 420 | 28.3 | 0.238 | 5.4 | LOS A | 1.5 | 13.3 | 0.21 | 0.47 | 0.21 | 45.2 |
| All Vehicles | | | 752 | 39.2 | 752 | 39.2 | 0.270 | 5.9 | LOS A | 1.5 | 16.0 | 0.33 | 0.51 | 0.33 | 44.0 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout 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.

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# MOVEMENT SUMMARY

## Site: 2 [Grand Avenue / Colquhuon Street - AM (Plus Construction) (Site Folder: Future 2028 + Construction)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Roundabout

**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: Colquhuon Street | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 113 | 54.2 | 113 | 54.2 | 0.200 | 6.3 | LOS A | 1.1 | 10.5 | 0.50 | 0.59 | 0.50 | 45.9 |
| 3 | R2 | All MCs | 35 | 15.2 | 35 | 15.2 | 0.200 | 8.8 | LOS A | 1.1 | 10.5 | 0.50 | 0.59 | 0.50 | 25.8 |
| 3u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.200 | 9.8 | LOS A | 1.1 | 10.5 | 0.50 | 0.59 | 0.50 | 44.7 |
| Approach | | | 148 | 44.7 | 148 | 44.7 | 0.200 | 6.9 | LOS A | 1.1 | 10.5 | 0.50 | 0.59 | 0.50 | 41.9 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 29 | 50.0 | 29 | 50.0 | 0.288 | 7.4 | LOS A | 1.6 | 17.0 | 0.53 | 0.57 | 0.53 | 40.4 |
| 5 | T1 | All MCs | 160 | 63.8 | 160 | 63.8 | 0.288 | 6.8 | LOS A | 1.6 | 17.0 | 0.53 | 0.57 | 0.53 | 43.9 |
| 6u | U | All MCs | 2 | 50.0 | 2 | 50.0 | 0.288 | 11.2 | LOS A | 1.6 | 17.0 | 0.53 | 0.57 | 0.53 | 13.3 |
| Approach | | | 192 | 61.5 | 192 | 61.5 | 0.288 | 6.9 | LOS A | 1.6 | 17.0 | 0.53 | 0.57 | 0.53 | 43.3 |
| West: Grand Avenue | | | | | | | | | | | | | | | |
| 11 | T1 | All MCs | 258 | 35.1 | 258 | 35.1 | 0.238 | 4.2 | LOS A | 1.5 | 13.3 | 0.21 | 0.40 | 0.21 | 45.2 |
| 12 | R2 | All MCs | 191 | 18.8 | 191 | 18.8 | 0.182 | 7.4 | LOS A | 1.1 | 8.6 | 0.20 | 0.59 | 0.20 | 46.5 |
| 12u | U | All MCs | 9 | 11.1 | 9 | 11.1 | 0.182 | 8.7 | LOS A | 1.1 | 8.6 | 0.20 | 0.59 | 0.20 | 46.8 |
| Approach | | | 458 | 27.8 | 458 | 27.8 | 0.238 | 5.6 | LOS A | 1.5 | 13.3 | 0.21 | 0.48 | 0.21 | 45.9 |
| All Vehicles | | | 798 | 39.1 | 798 | 39.1 | 0.288 | 6.2 | LOS A | 1.6 | 17.0 | 0.34 | 0.52 | 0.34 | 44.5 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout 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.

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Organisation: STANTEC NEW ZEALAND | Licence: NETWORK / Enterprise Level 5 | Processed: Tuesday, July 22, 2025 12:02:48 PM
Project: U:\300305541\technical\modelling\sid_250722_5541_gpop_draft_model.sip9

# MOVEMENT SUMMARY

## Site: 2 [Grand Avenue / Colquhuon Street - PM (Site Folder: Future 2028)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Roundabout

**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: Colquhuon Street | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 45 | 7.0 | 45 | 7.0 | 0.053 | 4.5 | LOS A | 0.2 | 1.8 | 0.36 | 0.52 | 0.36 | 46.7 |
| 3 | R2 | All MCs | 5 | 0.0 | 5 | 0.0 | 0.053 | 8.0 | LOS A | 0.2 | 1.8 | 0.36 | 0.52 | 0.36 | 26.3 |
| 3u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.053 | 9.4 | LOS A | 0.2 | 1.8 | 0.36 | 0.52 | 0.36 | 45.5 |
| Approach | | | 52 | 6.1 | 52 | 6.1 | 0.053 | 5.0 | LOS A | 0.2 | 1.8 | 0.36 | 0.52 | 0.36 | 45.0 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 27 | 3.8 | 27 | 3.8 | 0.159 | 4.6 | LOS A | 0.8 | 6.2 | 0.10 | 0.42 | 0.10 | 43.4 |
| 5 | T1 | All MCs | 179 | 9.4 | 179 | 9.4 | 0.159 | 3.8 | LOS A | 0.8 | 6.2 | 0.10 | 0.42 | 0.10 | 46.0 |
| 6u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.159 | 8.4 | LOS A | 0.8 | 6.2 | 0.10 | 0.42 | 0.10 | 14.4 |
| Approach | | | 207 | 8.6 | 207 | 8.6 | 0.159 | 3.9 | LOS A | 0.8 | 6.2 | 0.10 | 0.42 | 0.10 | 45.6 |
| West: Grand Avenue | | | | | | | | | | | | | | | |
| 11 | T1 | All MCs | 12 | 18.2 | 12 | 18.2 | 0.011 | 3.7 | LOS A | 0.1 | 0.4 | 0.06 | 0.40 | 0.06 | 46.0 |
| 12 | R2 | All MCs | 15 | 14.3 | 15 | 14.3 | 0.014 | 6.8 | LOS A | 0.1 | 0.5 | 0.06 | 0.62 | 0.06 | 45.4 |
| 12u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.014 | 8.3 | LOS A | 0.1 | 0.5 | 0.06 | 0.62 | 0.06 | 46.4 |
| Approach | | | 27 | 15.4 | 27 | 15.4 | 0.014 | 5.6 | LOS A | 0.1 | 0.5 | 0.06 | 0.52 | 0.06 | 45.7 |
| All Vehicles | | | 286 | 8.8 | 286 | 8.8 | 0.159 | 4.3 | LOS A | 0.8 | 6.2 | 0.14 | 0.45 | 0.14 | 45.5 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout 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.

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# MOVEMENT SUMMARY

## Site: 2 [Grand Avenue / Colquhuon Street - PM (Plus Construction) (Site Folder: Future 2028 + Construction)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Roundabout

**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: Colquhuon Street | | | | | | | | | | | | | | | |
| 1 | L2 | All MCs | 83 | 13.9 | 83 | 13.9 | 0.096 | 5.2 | LOS A | 0.5 | 3.6 | 0.38 | 0.54 | 0.38 | 49.9 |
| 3 | R2 | All MCs | 5 | 0.0 | 5 | 0.0 | 0.096 | 8.1 | LOS A | 0.5 | 3.6 | 0.38 | 0.54 | 0.38 | 27.1 |
| 3u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.096 | 9.4 | LOS A | 0.5 | 3.6 | 0.38 | 0.54 | 0.38 | 47.0 |
| Approach | | | 89 | 12.9 | 89 | 12.9 | 0.096 | 5.4 | LOS A | 0.5 | 3.6 | 0.38 | 0.54 | 0.38 | 48.8 |
| East: Grand Avenue | | | | | | | | | | | | | | | |
| 4 | L2 | All MCs | 27 | 3.8 | 27 | 3.8 | 0.168 | 4.7 | LOS A | 0.9 | 6.6 | 0.14 | 0.42 | 0.14 | 43.2 |
| 5 | T1 | All MCs | 179 | 9.4 | 179 | 9.4 | 0.168 | 3.9 | LOS A | 0.9 | 6.6 | 0.14 | 0.42 | 0.14 | 45.9 |
| 6u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.168 | 8.5 | LOS A | 0.9 | 6.6 | 0.14 | 0.42 | 0.14 | 14.3 |
| Approach | | | 207 | 8.6 | 207 | 8.6 | 0.168 | 4.0 | LOS A | 0.9 | 6.6 | 0.14 | 0.42 | 0.14 | 45.5 |
| West: Grand Avenue | | | | | | | | | | | | | | | |
| 11 | T1 | All MCs | 12 | 18.2 | 12 | 18.2 | 0.012 | 3.8 | LOS A | 0.1 | 0.5 | 0.07 | 0.40 | 0.07 | 46.0 |
| 12 | R2 | All MCs | 23 | 45.5 | 23 | 45.5 | 0.023 | 7.6 | LOS A | 0.1 | 1.1 | 0.06 | 0.61 | 0.06 | 46.9 |
| 12u | U | All MCs | 1 | 0.0 | 1 | 0.0 | 0.023 | 8.3 | LOS A | 0.1 | 1.1 | 0.06 | 0.61 | 0.06 | 47.6 |
| Approach | | | 36 | 35.3 | 36 | 35.3 | 0.023 | 6.4 | LOS A | 0.1 | 1.1 | 0.06 | 0.54 | 0.06 | 46.7 |
| All Vehicles | | | 333 | 12.7 | 333 | 12.7 | 0.168 | 4.7 | LOS A | 0.9 | 6.6 | 0.20 | 0.47 | 0.20 | 46.7 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout 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.

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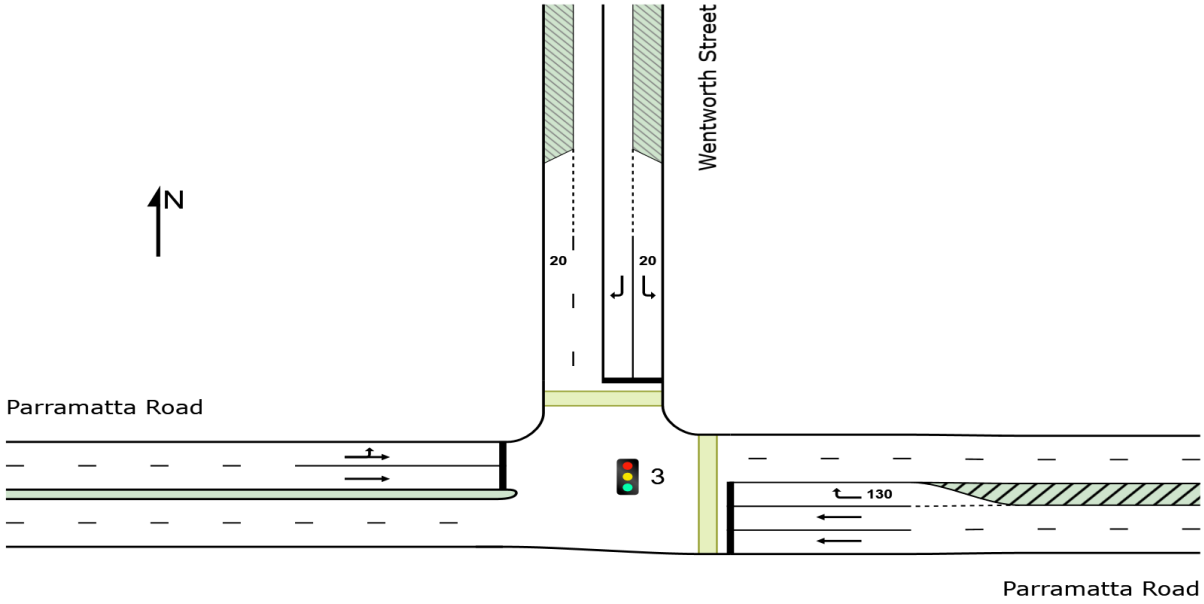
# SITE LAYOUT

## Site: 3 [Parramatta Road / Wentworth Street - AM (Site Folder: Future 2028)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



# MOVEMENT SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - AM (Site Folder: Future 2028)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 120 seconds (Site User-Given Cycle Time)

**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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | | | | |
| 5 | T1 | All MCs | 2159 | 9.2 | 2159 | 9.2 | 0.800 | 11.4 | LOS A | 39.8 | 300.5 | 0.69 | 0.63 | 0.69 | 50.0 |
| 6 | R2 | All MCs | 109 | 12.5 | 109 | 12.5 | * 0.642 | 44.6 | LOS D | 4.9 | 37.8 | 1.00 | 0.80 | 1.05 | 34.8 |
| Approach | | | 2268 | 9.3 | 2268 | 9.3 | 0.800 | 13.0 | LOS A | 39.8 | 300.5 | 0.71 | 0.64 | 0.71 | 47.9 |
| North: Wentworth Street | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 36 | 38.2 | 36 | 38.2 | 0.245 | 39.5 | LOS C | 1.5 | 14.0 | 0.96 | 0.72 | 0.96 | 35.0 |
| 9 | R2 | All MCs | 48 | 43.5 | 48 | 43.5 | 0.216 | 53.5 | LOS D | 2.5 | 24.4 | 0.91 | 0.74 | 0.91 | 23.4 |
| Approach | | | 84 | 41.3 | 84 | 41.3 | 0.245 | 47.6 | LOS D | 2.5 | 24.4 | 0.93 | 0.73 | 0.93 | 28.6 |
| West: Parramatta Road | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 87 | 18.1 | 87 | 18.1 | * 1.226 | 227.9 | LOS F | 158.3 | 1203.0 | 1.00 | 1.62 | 2.47 | 8.5 |
| 11 | T1 | All MCs | 2347 | 9.4 | 2347 | 9.4 | * 1.226 | 242.5 | LOS F | 159.2 | 1203.9 | 1.00 | 1.90 | 2.47 | 10.4 |
| Approach | | | 2435 | 9.7 | 2435 | 9.7 | 1.226 | 241.9 | LOS F | 159.2 | 1203.9 | 1.00 | 1.89 | 2.47 | 10.3 |
| All Vehicles | | | 4787 | 10.1 | 4787 | 10.1 | 1.226 | 130.1 | LOS F | 159.2 | 1203.9 | 0.86 | 1.28 | 1.61 | 16.8 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | |
| P2 | Full | 1 | 1 | 54.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 208.0 | 200.0 | 0.96 |
| North: Wentworth Street | | | | | | | | | | | | |
| P3 | Full | 12 | 13 | 54.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 208.0 | 200.0 | 0.96 |
| All Pedestrians | | 13 | 14 | 54.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 208.0 | 200.0 | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# PHASING SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - AM (Site Folder: Future 2028)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 120 seconds (Site User-Given Cycle Time)

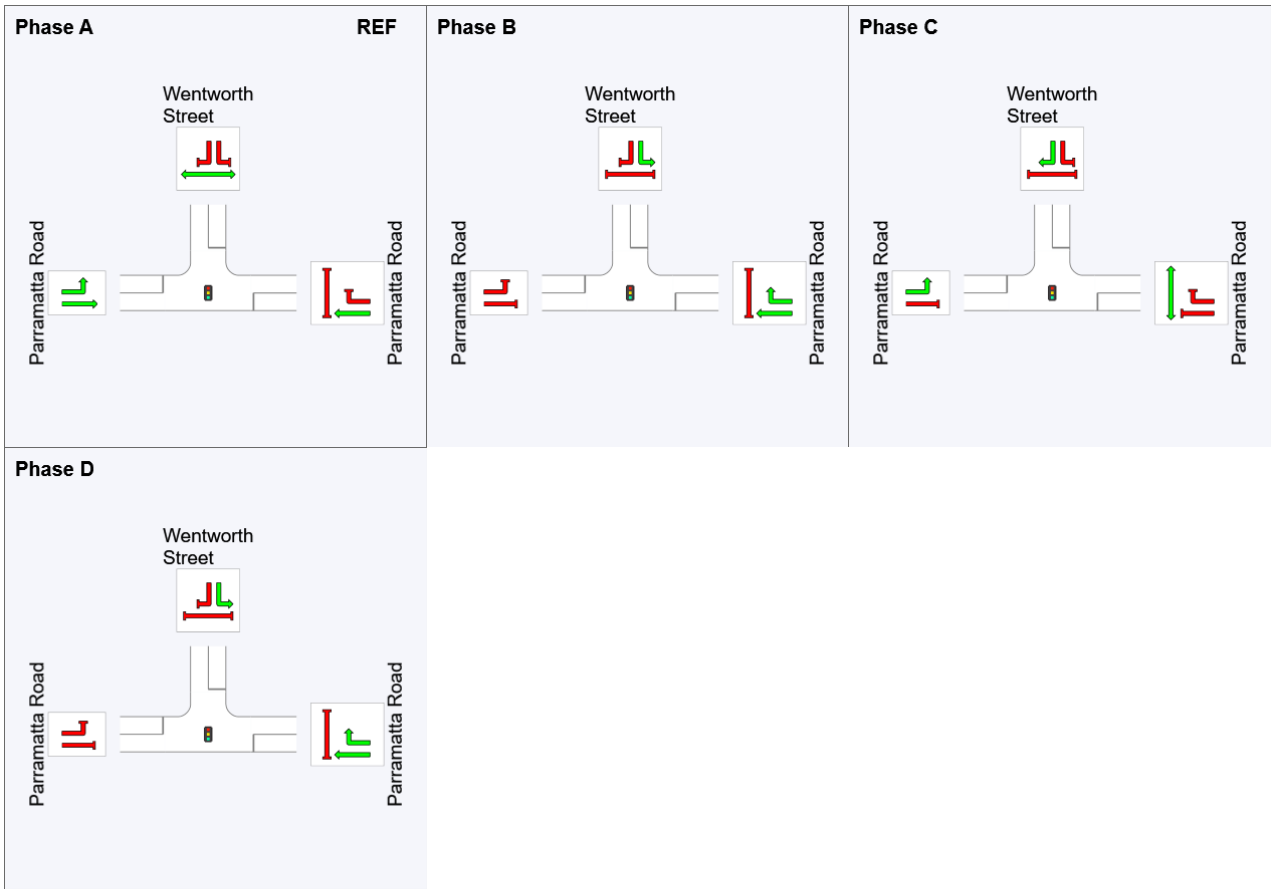
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns**
**Input Phase Sequence: A, B, C, D**
**Output Phase Sequence: A, B, C, D**
**Reference Phase: Phase A**

### Phase Timing Summary

| Phase | A | B | C | D |
|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 71 | 83 | 108 |
| Green Time (sec) | 65 | 6 | 19 | 6 |
| Phase Time (sec) | 71 | 12 | 25 | 12 |
| Phase Split | 59% | 10% | 21% | 10% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 |

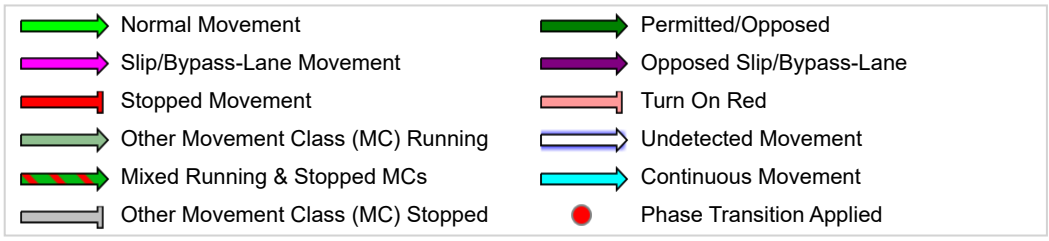
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase

VAR: Variable Phase

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# MOVEMENT SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - AM (Plus Construction) (Site Folder: Future 2028 + Construction)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 120 seconds (Site User-Given Cycle Time)

**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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | | | | |
| 5 | T1 | All MCs | 2159 | 9.2 | 2159 | 9.2 | 0.794 | 10.6 | LOS A | 38.9 | 293.7 | 0.68 | 0.62 | 0.68 | 50.5 |
| 6 | R2 | All MCs | 184 | 16.0 | 184 | 16.0 | * 1.105 | 149.9 | LOS F | 14.0 | 111.4 | 1.00 | 1.42 | 2.12 | 16.4 |
| Approach | | | 2343 | 9.7 | 2343 | 9.7 | 1.105 | 21.6 | LOS B | 38.9 | 293.7 | 0.70 | 0.68 | 0.79 | 41.1 |
| North: Wentworth Street | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 52 | 57.1 | 52 | 57.1 | 0.391 | 41.6 | LOS C | 2.3 | 23.7 | 0.97 | 0.75 | 0.97 | 34.7 |
| 9 | R2 | All MCs | 64 | 57.4 | 64 | 57.4 | 0.325 | 56.2 | LOS D | 3.5 | 36.3 | 0.93 | 0.76 | 0.93 | 22.9 |
| Approach | | | 116 | 57.3 | 116 | 57.3 | 0.391 | 49.7 | LOS D | 3.5 | 36.3 | 0.95 | 0.76 | 0.95 | 28.4 |
| West: Parramatta Road | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 162 | 19.5 | 162 | 19.5 | * 1.249 | 247.5 | LOS F | 168.2 | 1285.2 | 1.00 | 1.67 | 2.57 | 8.1 |
| 11 | T1 | All MCs | 2347 | 9.4 | 2347 | 9.4 | * 1.249 | 261.6 | LOS F | 170.2 | 1287.3 | 1.00 | 1.98 | 2.57 | 9.8 |
| Approach | | | 2509 | 10.0 | 2509 | 10.0 | 1.249 | 260.7 | LOS F | 170.2 | 1287.3 | 1.00 | 1.96 | 2.57 | 9.7 |
| All Vehicles | | | 4968 | 11.0 | 4968 | 11.0 | 1.249 | 143.0 | LOS F | 170.2 | 1287.3 | 0.86 | 1.33 | 1.69 | 15.7 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | |
| P2 | Full | 1 | 1 | 54.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 208.0 | 200.0 | 0.96 |
| North: Wentworth Street | | | | | | | | | | | | |
| P3 | Full | 12 | 13 | 54.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 208.0 | 200.0 | 0.96 |
| All Pedestrians | | 13 | 14 | 54.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 208.0 | 200.0 | 0.96 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# PHASING SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - AM (Plus Construction) (Site Folder: Future 2028 + Construction)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 120 seconds (Site User-Given Cycle Time)

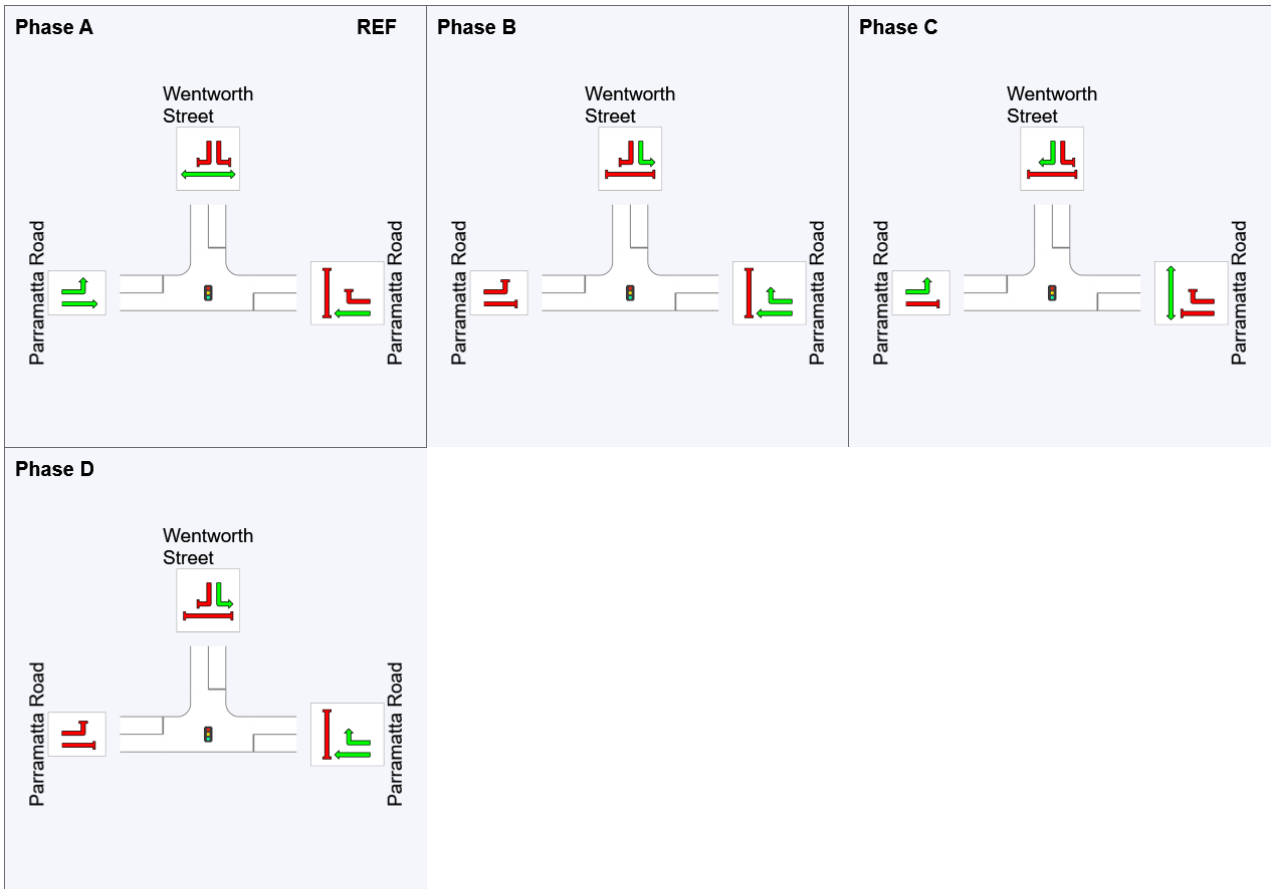
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns**
**Input Phase Sequence: A, B, C, D**
**Output Phase Sequence: A, B, C, D**
**Reference Phase: Phase A**

### Phase Timing Summary

| Phase | A | B | C | D |
|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 72 | 84 | 108 |
| Green Time (sec) | 66 | 6 | 18 | 6 |
| Phase Time (sec) | 72 | 12 | 24 | 12 |
| Phase Split | 60% | 10% | 20% | 10% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 |

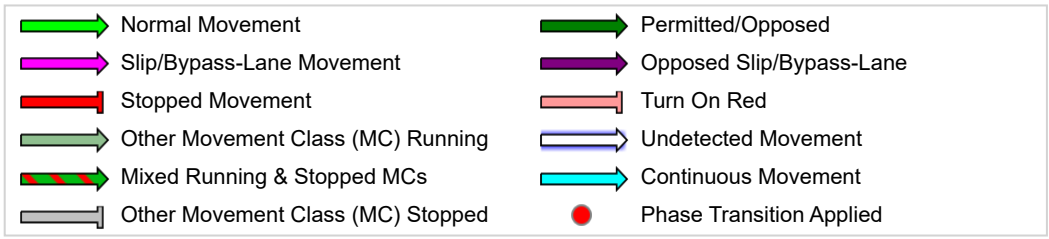
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase

VAR: Variable Phase

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Organisation: STANTEC NEW ZEALAND | Licence: NETWORK / Enterprise Level 5 | Processed: Tuesday, July 22, 2025 12:02:49 PM
Project: U:\300305541\technical\modelling\sid_250722_5541_gpop_draft_model.sip9

# MOVEMENT SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - PM (Site Folder: Future 2028)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 130 seconds (Site User-Given Cycle Time)

**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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | | | | |
| 5 | T1 | All MCs | 1872 | 4.6 | 1872 | 4.6 | 0.707 | 12.8 | LOS A | 34.6 | 251.8 | 0.65 | 0.59 | 0.65 | 48.6 |
| 6 | R2 | All MCs | 31 | 3.4 | 31 | 3.4 | 0.182 | 41.8 | LOS C | 1.3 | 9.2 | 0.96 | 0.71 | 0.96 | 35.4 |
| Approach | | | 1902 | 4.6 | 1902 | 4.6 | 0.707 | 13.3 | LOS A | 34.6 | 251.8 | 0.65 | 0.60 | 0.65 | 47.7 |
| North: Wentworth Street | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 59 | 1.8 | 59 | 1.8 | * 0.348 | 47.3 | LOS D | 2.5 | 18.0 | 0.97 | 0.74 | 0.97 | 35.2 |
| 9 | R2 | All MCs | 105 | 7.0 | 105 | 7.0 | 0.310 | 58.7 | LOS E | 5.7 | 42.2 | 0.89 | 0.77 | 0.89 | 24.7 |
| Approach | | | 164 | 5.1 | 164 | 5.1 | 0.348 | 54.7 | LOS D | 5.7 | 42.2 | 0.92 | 0.76 | 0.92 | 27.1 |
| West: Parramatta Road | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 45 | 7.0 | 45 | 7.0 | * 1.144 | 156.9 | LOS F | 131.5 | 942.7 | 1.00 | 1.41 | 1.99 | 10.9 |
| 11 | T1 | All MCs | 2214 | 2.6 | 2214 | 2.6 | * 1.144 | 176.1 | LOS F | 131.7 | 942.7 | 1.00 | 1.60 | 1.99 | 13.3 |
| Approach | | | 2259 | 2.7 | 2259 | 2.7 | 1.144 | 175.7 | LOS F | 131.7 | 942.7 | 1.00 | 1.60 | 1.99 | 13.2 |
| All Vehicles | | | 4325 | 3.6 | 4325 | 3.6 | 1.144 | 99.7 | LOS F | 131.7 | 942.7 | 0.84 | 1.13 | 1.36 | 20.0 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | |
| P2 | Full | 1 | 1 | 59.1 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 213.0 | 200.0 | 0.94 |
| North: Wentworth Street | | | | | | | | | | | | |
| P3 | Full | 12 | 13 | 59.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 213.0 | 200.0 | 0.94 |
| All Pedestrians | | 13 | 14 | 59.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 213.0 | 200.0 | 0.94 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# PHASING SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - PM (Site Folder: Future 2028)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 130 seconds (Site User-Given Cycle Time)

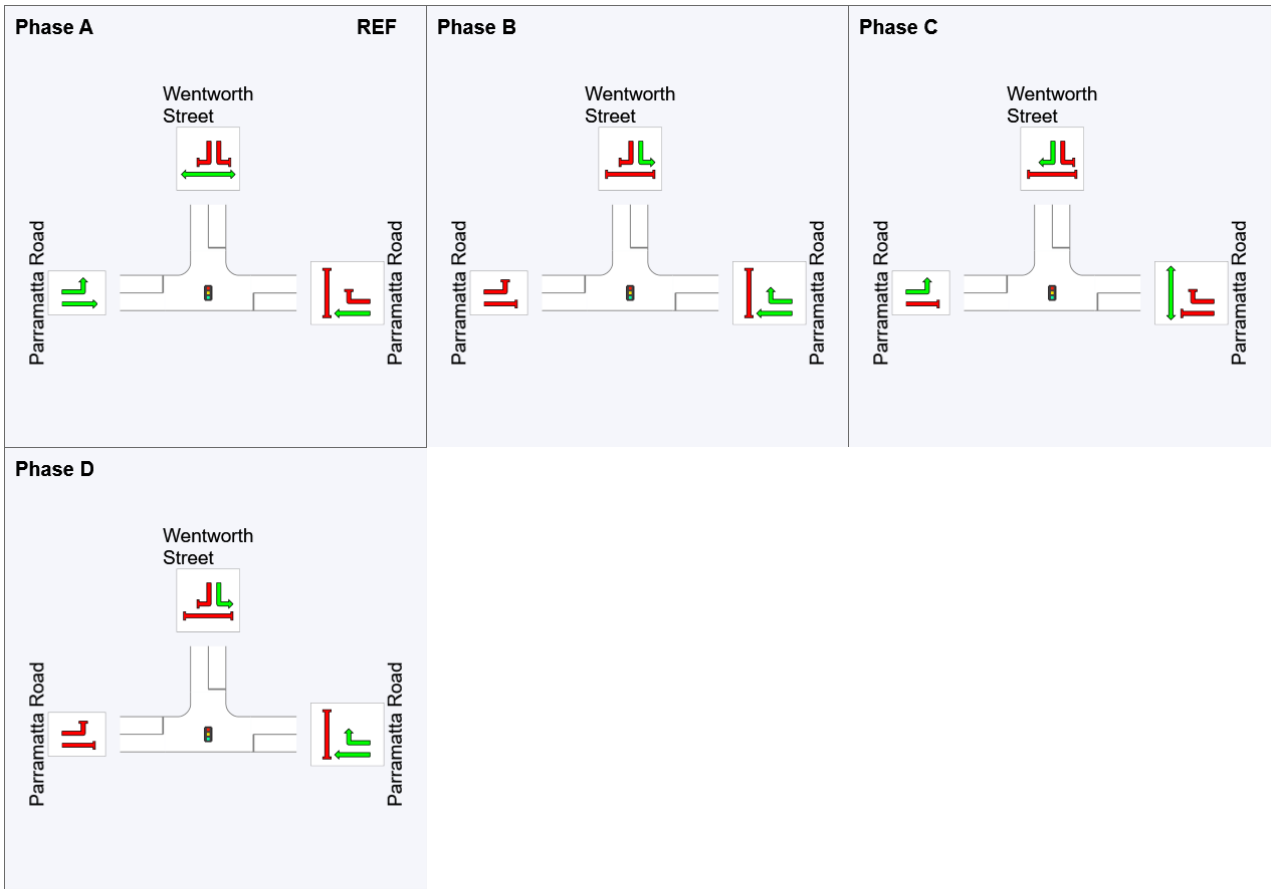
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns**
**Input Phase Sequence: A, B, C, D**
**Output Phase Sequence: A, B, C, D**
**Reference Phase: Phase A**

### Phase Timing Summary

| Phase | A | B | C | D |
|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 73 | 85 | 118 |
| Green Time (sec) | 67 | 6 | 27 | 6 |
| Phase Time (sec) | 73 | 12 | 33 | 12 |
| Phase Split | 56% | 9% | 25% | 9% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 |

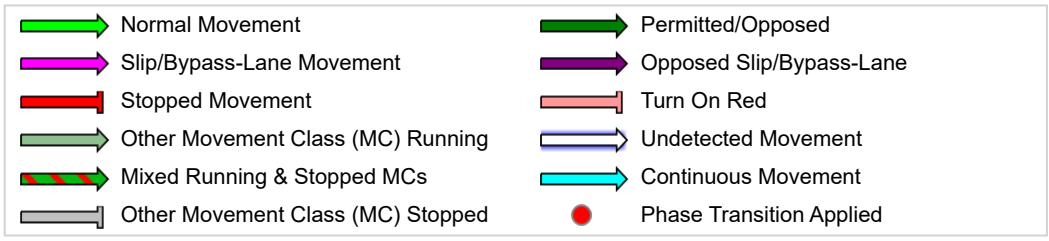
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase

VAR: Variable Phase

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# MOVEMENT SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - PM (Plus Construction) (Site Folder: Future 2028 + Construction)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 130 seconds (Site User-Given Cycle Time)

**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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | | | | |
| 5 | T1 | All MCs | 1872 | 4.6 | 1872 | 4.6 | 0.677 | 9.8 | LOS A | 30.9 | 225.0 | 0.58 | 0.53 | 0.58 | 50.5 |
| 6 | R2 | All MCs | 46 | 36.4 | 46 | 36.4 | 0.272 | 41.6 | LOS C | 2.0 | 18.8 | 0.95 | 0.74 | 0.95 | 35.3 |
| Approach | | | 1918 | 5.4 | 1918 | 5.4 | 0.677 | 10.6 | LOS A | 30.9 | 225.0 | 0.59 | 0.54 | 0.59 | 49.8 |
| North: Wentworth Street | | | | | | | | | | | | | | | |
| 7 | L2 | All MCs | 208 | 15.7 | 208 | 15.7 | * 1.095 | 155.0 | LOS F | 17.2 | 136.9 | 1.00 | 1.40 | 1.98 | 16.7 |
| 9 | R2 | All MCs | 105 | 7.0 | 105 | 7.0 | 0.543 | 72.5 | LOS F | 6.2 | 45.7 | 0.96 | 1.02 | 0.96 | 23.4 |
| Approach | | | 314 | 12.8 | 314 | 12.8 | 1.095 | 127.3 | LOS F | 17.2 | 136.9 | 0.99 | 1.27 | 1.64 | 16.7 |
| West: Parramatta Road | | | | | | | | | | | | | | | |
| 10 | L2 | All MCs | 61 | 31.0 | 61 | 31.0 | * 1.141 | 155.6 | LOS F | 131.0 | 949.9 | 1.00 | 1.41 | 1.97 | 11.1 |
| 11 | T1 | All MCs | 2214 | 2.6 | 2214 | 2.6 | * 1.141 | 173.1 | LOS F | 132.5 | 949.9 | 1.00 | 1.59 | 1.97 | 13.5 |
| Approach | | | 2275 | 3.4 | 2275 | 3.4 | 1.141 | 172.7 | LOS F | 132.5 | 949.9 | 1.00 | 1.59 | 1.97 | 13.4 |
| All Vehicles | | | 4506 | 4.9 | 4506 | 4.9 | 1.141 | 100.5 | LOS F | 132.5 | 949.9 | 0.82 | 1.12 | 1.36 | 19.9 |

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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 Green.
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.

* Critical Movement (Signal Timing)

**Pedestrian Movement Performance**

| Mov ID | Crossing | Input Vol. ped/h | Dem. Flow ped/h | Aver. Delay sec | Level of Service | AVERAGE BACK OF QUEUE [ Ped ped | Dist ] m | Prop. Que | Eff. Stop Rate | Travel Time sec | Travel Dist. m | Aver. Speed m/sec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East: Parramatta Road | | | | | | | | | | | | |
| P2 | Full | 1 | 1 | 59.1 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 213.0 | 200.0 | 0.94 |
| North: Wentworth Street | | | | | | | | | | | | |
| P3 | Full | 12 | 13 | 59.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 213.0 | 200.0 | 0.94 |
| All Pedestrians | | 13 | 14 | 59.2 | LOS E | 0.0 | 0.0 | 0.95 | 0.95 | 213.0 | 200.0 | 0.94 |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# PHASING SUMMARY

## Site: 3 [Parramatta Road / Wentworth Street - PM (Plus Construction) (Site Folder: Future 2028 + Construction)]

**Output produced by SIDRA INTERSECTION Version: 9.1.6.228**

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated  Cycle Time = 130 seconds (Site User-Given Cycle Time)

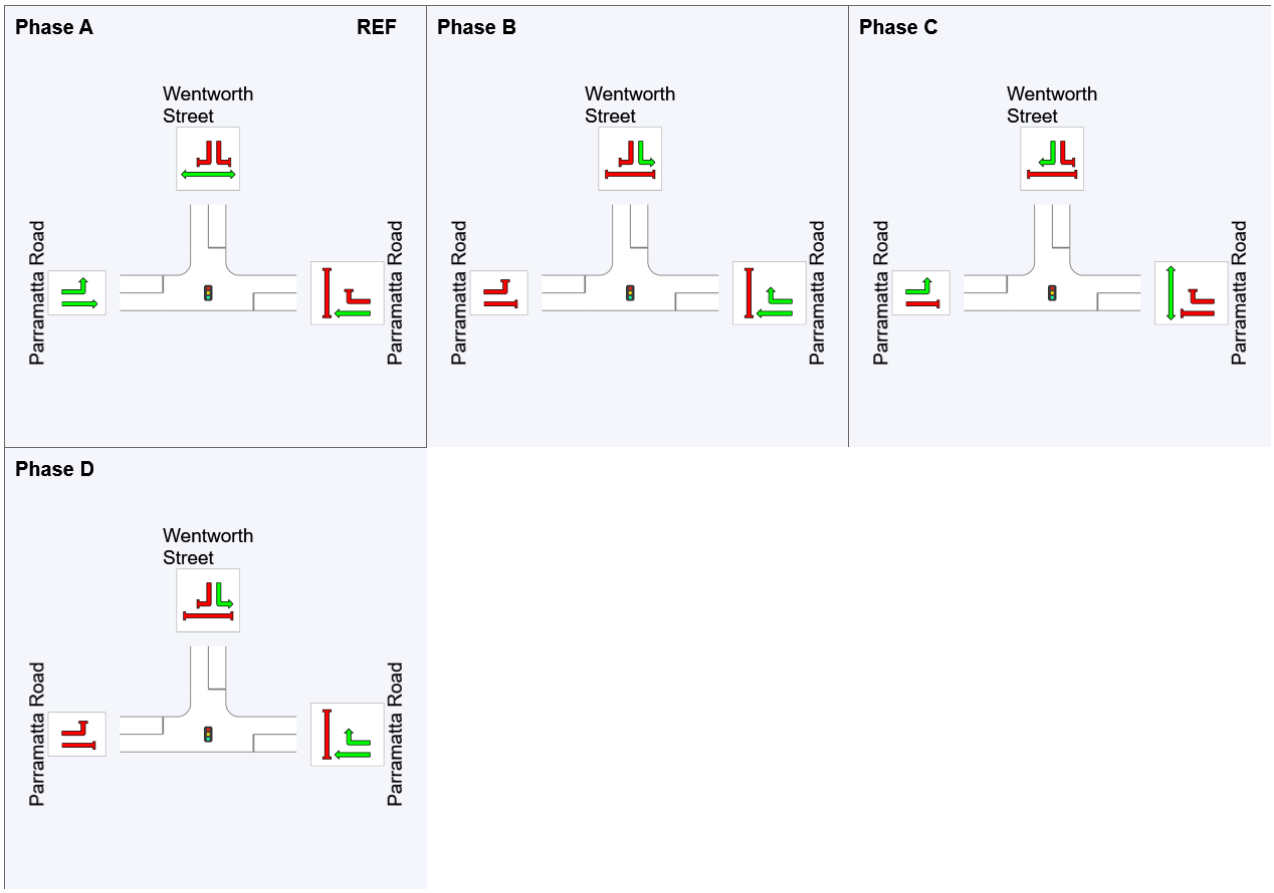
**Timings based on settings in the Site Phasing & Timing dialog**
**Phase Times determined by the program**
**Phase Sequence: Four-Phase Leading Right Turns**
**Input Phase Sequence: A, B, C, D**
**Output Phase Sequence: A, B, C, D**
**Reference Phase: Phase A**

### Phase Timing Summary

| Phase | A | B | C | D |
|---|---|---|---|---|
| Phase Change Time (sec) | 0 | 74 | 86 | 115 |
| Green Time (sec) | 68 | 6 | 23 | 9 |
| Phase Time (sec) | 74 | 12 | 29 | 15 |
| Phase Split | 57% | 9% | 22% | 12% |
| Phase Frequency (%) | 100.0 | 100.0 | 100.0 | 100.0 |

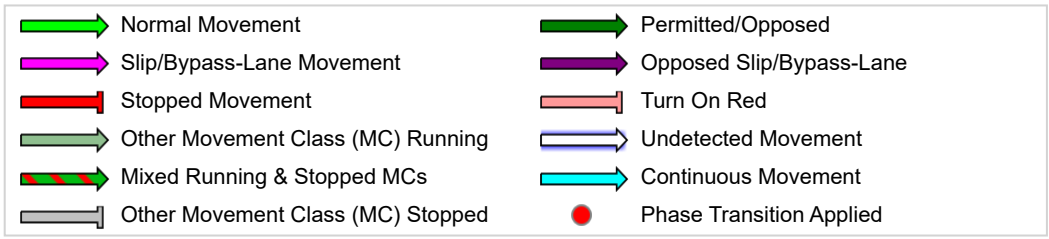
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

### Output Phase Sequence




REF: Reference Phase

VAR: Variable Phase

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Organisation: STANTEC NEW ZEALAND | Licence: NETWORK / Enterprise Level 5 | Processed: Tuesday, July 22, 2025 12:02:50 PM
Project: U:\300305541\technical\modelling\sid_250722_5541_gpop_draft_model.sip9

# Appendix C. Swept Path Assessments

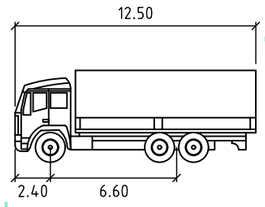
VEHICLE ENTRY (HRV)

ISLAND TO BE REMOVED DURING CONSTRUCTION AS IT ENCROACHES ON HRV AND AV SWEPT PATHS WHEN EXITING ONTO DEVON STREET.

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH (IN / OUT)
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5 km/h




HRV

| | meters |
|---|---|
| Width | : 2.50 |
| Track | : 2.50 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 35.2 |

SURVEY BASE IN GREEN
DRAWING xSUR-C3D-CMLA-9008-WRRF SITE SURVEY.dwg
BY JACOBS
DATED 05.07.2024

INTERNAL ROAD BASE IN BLUE
DRAWING IA319500-CIV-0001.dwg
BY JACOBS

Stantec

nearmap.com

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

| | |
|---|---|
| DESIGNED D.CHENG | DESIGN CHECK O.HASHMI |
| APPROVED BY D.SALANGSANG | DATE ISSUED 7 AUGUST 2025 |

SCALE A3 - N/A

CAD FILE NO. 300305541-01-P1.DWG

GREATER PARRAMATTA OLYMPIC PENINSULA (GPOP)
WATER CYCLE MANAGEMENT
WRRF
SWEPT PATH ASSESSMENT

DRAWING NO. ~~300305541-01~~-01 SHEET ~~01~~ OF 04 ISSUE P1

\\AU2012-NTAP01_CIFS02\SHARED_PROJECTS\300305541\TECHNICAL\DRAWINGS\300305541-01-P1.DWG PLOTTED BY CHENG, DARREN ON 07/08/2025 AT 16:12

VEHICLE EXIT (HRV)

ISLAND TO BE REMOVED DURING CONSTRUCTION AS IT ENCROACHES ON HRV AND AV SWEPT PATHS WHEN EXITING ONTO DEVON STREET.

DEVON STREET

COLQUHOUN STREET

SITE ENTRANCE

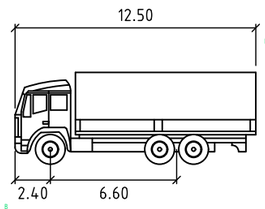
UNSEALED ROAD

LOT 1
DP1300589

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH (IN / OUT)
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5 km/h




HRV

| | meters |
|---|---|
| Width | : 2.50 |
| Track | : 2.50 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 35.2 |

SURVEY BASE IN GREEN
DRAWING xSUR-C3D-CMLA-9008-WRRF SITE SURVEY.dwg
BY JACOBS
DATED 05.07.2024

INTERNAL ROAD BASE IN BLUE
DRAWING IA319500-CIV-0001.dwg
BY JACOBS

Stantec

nearmap.com

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

| | |
|---|---|
| DESIGNED D.CHENG | DESIGN CHECK O.HASHMI |
| APPROVED BY D.SALANGSANG | DATE ISSUED 7 AUGUST 2025 |
| SCALE A3 - N/A | |
| CAD FILE NO. 300305541-01-P1.DWG | |

GREATER PARRAMATTA OLYMPIC PENINSULA (GPOP)
WATER CYCLE MANAGEMENT
WRRF
SWEPT PATH ASSESSMENT

DRAWING NO. ~~300305541-~~01-02 SHEET ~~02~~ OF 04 ISSUE P1

\\AU2012-NTAP01_CIFS02\SHARED_PROJECTS\300305541\TECHNICAL\DRAWINGS\300305541-01-P1.DWG PLOTTED BY CHENG, DARREN ON 07/08/2025 AT 16:12

VEHICLE ENTRY (AV)

ISLAND TO BE REMOVED DURING CONSTRUCTION AS IT ENCROACHES ON HRV AND AV SWEPT PATHS WHEN EXITING ONTO DEVON STREET.

DEVON STREET

COLQUHOUN STREET

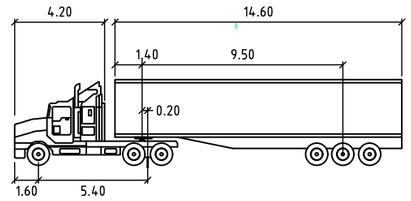
UNSEALED ROAD

LOT 1
DP1300589

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH (IN / OUT)
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5 km/h




AV AS2890.2 20m

| meters | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 2.50 | Steering Angle | : 28.3 |
| Tractor Track | : 2.50 | Articulating Angle | : 72.0 |
| Trailer Track | : 2.50 | | |

SURVEY BASE IN GREEN
DRAWING xSUR-C3D-CMLA-9008-WRRF SITE SURVEY.dwg
BY JACOBS
DATED 05.07.2024

INTERNAL ROAD BASE IN BLUE
DRAWING IA319500-CIV-0001.dwg
BY JACOBS

Stantec

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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
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| | |
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| DESIGNED D.CHENG | DESIGN CHECK O.HASHMI |
| APPROVED BY D.SALANGSANG | DATE ISSUED 7 AUGUST 2025 |

SCALE A3 - N/A

CAD FILE NO. 300305541-01-P1.DWG

GREATER PARRAMATTA OLYMPIC PENINSULA (GPOP)
WATER CYCLE MANAGEMENT
WRRF
SWEPT PATH ASSESSMENT

DRAWING NO. ~~300305541-01~~-03 SHEET ~~03~~ OF 04 ISSUE P1

\\AU2012-NTAP01_CIFS02\SHARED_PROJECTS\300305541\TECHNICAL\DRAWINGS\300305541-01-P1.DWG PLOTTED BY CHENG, DARREN ON 07/08/2025 AT 16:12

VEHICLE EXIT (AV)

ISLAND TO BE REMOVED DURING CONSTRUCTION AS IT ENCROACHES ON HRV AND AV SWEPT PATHS WHEN EXITING ONTO DEVON STREET.

VEHICLE ENCHROACHING ON KERB AND USES INDICATIVE INTERNAL ROAD CENTERLINE.

DEVON STREET

COLQUHOUN STREET

SITE ENTRANCE

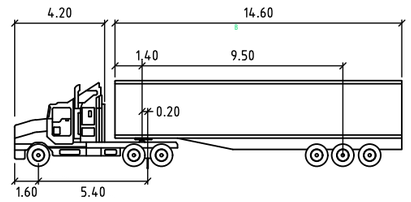
UNSEALED ROAD

LOT 1
DP1300589

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH (IN / OUT)
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5 km/h




AV AS2890.2 20m

| meters | | | |
|---|---|---|---|
| Tractor Width | : 2.50 | Lock to Lock Time | : 6.0 |
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| DESIGNED | DESIGN CHECK |
|---|---|
| D.CHENG | O.HASHMI |
| APPROVED BY | DATE ISSUED |
| D.SALANGSANG | 7 AUGUST 2025 |

SCALE A3 - N/A

CAD FILE NO. 300305541-01-P1.DWG

GREATER PARRAMATTA OLYMPIC PENINSULA (GPOP)
WATER CYCLE MANAGEMENT
WRRF
SWEPT PATH ASSESSMENT

DRAWING NO. ~~300305541-04~~ 300305541-01-04 SHEET ~~04~~ 04 OF 04 ISSUE P1

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# Appendix D. Framework Construction Traffic Management Plan

# Appendix D:
# Greater Parramatta and Olympic Peninsula (GPOP) Water Cycle Management

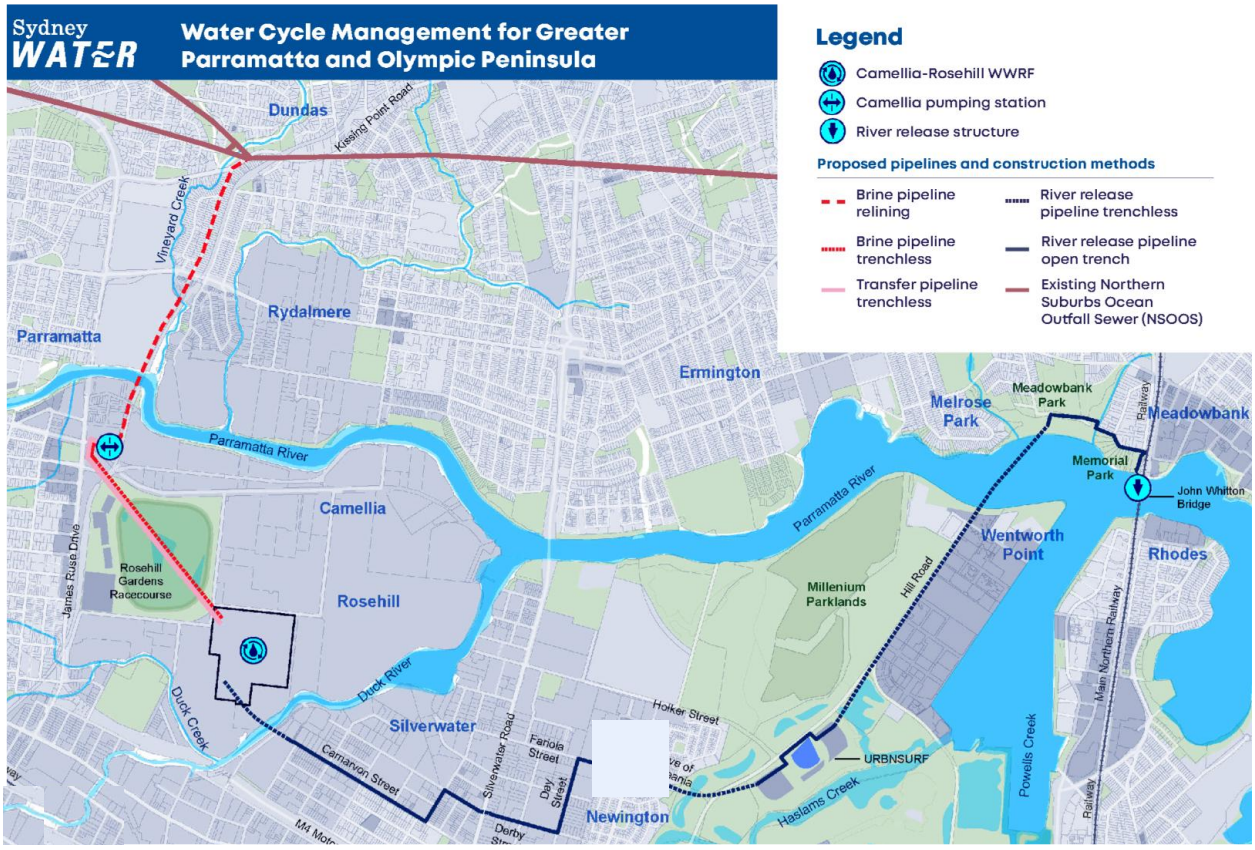
## Framework Construction Traffic Management Plan

10 December 2025

Prepared for: Sydney Water

Prepared by: Stantec Australia Pty Ltd

Project: 300305541




Stantec

# Revision Schedule

| Revision No. | Date | Description | Prepared by | Reviewed by | Approved by |
|---|---|---|---|---|---|
| **Final v3** | 10 October 2025 | Final incorporating comments | D. Cheng | O. Hashmi | S. Manton |
| **Final v4** | 1 December 2025 | Final incorporating comments | D. Cheng | O. Hashmi | S. Manton |
| **Final v5** | 9 December 2025 | Final incorporating comments | D. Cheng | O. Hashmi | S. Manton |
| **Final v6** | 10 December 2025 | Final incorporating comments | D. Cheng | O. Hashmi | S. Manton |

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Prepared by: [redacted]

Signature

Darren Cheng

Reviewed by: [redacted]

Signature

Osama Hashmi

Approved by: [redacted]

Signature

Steve Manton

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## List of Tables



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# Glossary of Terms and Abbreviations

| Abbreviation | Meaning |
|---|---|
| **CEMP** | Construction Environmental Management Plan |
| **CTMP** | Construction Traffic Management Plan |
| **DPHI** | Department of Planning, Housing and Infrastructure |
| **DCP** | Development Control Plan |
| **EIS** | Environmental Impact Statement |
| **GPOP** | Greater Parramatta and Olympic Peninsula |
| **HV** | Heavy Vehicle |
| **LV** | Light Vehicles |
| **LGA** | Local Government Area |
| **NHVR** | National Heavy Vehicle Regulator |
| **NSOOS** | Northern Suburbs Ocean Outfall Sewer |
| **PaMP** | Parking Management Plan |
| **PeMP** | Pedestrian Movement Plan |
| **PBS** | Performance Based Standards |
| **ROL** | Road Occupancy License |
| **RTA** | Roads Traffic Authority |
| **SPECTS** | Safety, Productivity and Environment Construction Transport Scheme |
| **SSCTMPs** | Site Specific Construction Traffic Management Plan |
| **TGS** | Traffic Guidance Scheme |
| **TfNSW** | Transport for New South Wales |
| **VMS** | Variable Message Signs |
| **VMP** | Vehicle Management Plan |
| **WRRF** | Wastewater Resource Recovery Facility |
| **WSU** | Western Sydney University |

# 1 Introduction

## 1.1 Purpose

The purpose of this Framework Construction Traffic Management Plan (Framework CTMP) is to outline the approach to managing traffic and transport impacts which may arise throughout the construction phase of the project.

This document covers the construction of the Greater Parramatta and Olympic Peninsula (GPOP) Water Cycle Management, the pipelines and all associated ancillary facilities including temporary site compounds and access roads. This document is a technical appendix to the project's traffic and transport report and references information from that report.

## 1.2 Context

Given the broad extents of the construction works, its impact is expected to be widespread across the GPOP region. In addition to this, construction traffic is a key contributor to congestion and disruption on the roads in New South Wales. Therefore, it is vital that controls and measures relating to construction traffic are implemented from the outset across the project.

This document will build upon construction traffic impacts identified in the project's traffic and transport report and present mitigation measures and protocols to ensure construction traffic movements are managed appropriately throughout the construction phase.

## 1.3 Guidelines and Legislation

This section outlines legislation, guidelines and standards applicable to the CTMP, building upon the project's traffic and transport report which provides a summary of legislation relevant to the impact assessment.

### 1.3.1 Legislation

Legislation relevant to this document is outlined in Table 1.1.

**Table 1.1: Legislation Context**

| Legislation | Content Description | Relevance |
|---|---|---|
| Roads Act (NSW Government, 1993) | This Act addresses requirements related to public roads which include:<br>• process for opening and closing roads<br>• any activities impacting public roads<br>• access for the community<br>• road classification and corresponding road authorities<br>• function of the road authorities. | This Act dictates the approval processes required when undertaking any works on public roads and the relevant road authorities. |
| Disability Discrimination Act (Australian Government, 1992) | This Act seeks to eliminate any discrimination against a person based on the grounds of disability ensuring equality as the rest of the community. | This Act dictates the requirements for vulnerable road users. |

### 1.3.2 Guidelines and Standards

Table 1.2 provides a summary of the main guidelines, specifications and policy documents relevant to this CTMP. The guidelines and standards that apply to construction traffic management are not limited to the standards outlined below.

**Table 1.2: Guidelines and Standards Context**

| Guidelines / Standards | Content Description | Relevance |
|---|---|---|
| Traffic Control at Work Sites Manual (Roads and Traffic Authority, 2010) (RTA) | This document outlines the minimum safety requirements for temporary traffic management at Transport for New South Wales (TfNSW) work sites or works carried out on behalf of TfNSW. | This document dictates the health and safety requirements for work sites within New South Wales. |
| Australian Standard AS1742 Parts 1 to 14, Manual of uniform traffic control devices | This standard outline traffic control requirements. The individual parts within this overarching standard cover usage of each sign. | This document outlines the requirements for traffic controls on work sites including implementation and inspections throughout New South Wales |
| Development Control Plans (DCPs) (Parramatta City Council) | These documents prescribes more detailed planning and design guidelines for developments proposed within the relevant Local Government Area (LGA) or precincts identified in the GPOP area. | These documents provide guidance on various construction activities such as landscaping, car parking, access and waste disposal. |

## 1.4 Scope

This Framework CTMP presents the overarching objectives and principles that will apply throughout the construction phase. Using these the document outlines measures to manage construction traffic on all work sites within the study area and any public infrastructure adjacent to work sites which may be impacted during construction.

Upon appointment of the construction contractor(s), additional management plans will need to be developed which include (but are not limited to):

- Site Specific CTMPs (SSCTMPs)
- Traffic Guidance Schemes (TGS)
- Vehicle Movement Plans (VMP)
- Pedestrian Movement Plans (PeMP)
- Parking Management Plans (PaMP).

These plans will incorporate details relating to the work sites where different construction activities may be occurring and provide specific construction traffic management solutions where required.

These more detailed documents will be guided by the principles outlined in this Framework CTMP and any additional requirements outlined by landowners or approving authorities. In addition to these plans, a Construction Environmental Management Plan (CEMP) will be prepared following approval of the Environmental Impact Statement (EIS). This document will be cognisant of the principles outlined in this Framework CTMP.

### 1.4.1 Hierarchy of Management Plans

Table 1.3 presents the hierarchy, scope and responsibilities relating to all construction traffic management plans required across the project lifecycle.

**Table 1.3: Traffic Management Plan Hierarchy, Purpose and Document Owner**

| Traffic Management Plan | Scope | Purpose and Additional Requirements | Document Owner |
|---|---|---|---|
| Framework CTMP | Project-wide | Sets the overarching objectives, principles and measures for traffic management during construction for the project. This will be applicable to all proposed work sites. | Sydney Water, to be reviewed and updated by the construction contractor(s) once appointed |
| CEMP | Project-wide | Provides a structured approach to the management of environmental issues during construction. | Construction contractors(s) |
| SSCTMPs | Site specific | Details the traffic management measures specific to each work site. The document will be guided by the CTMP. | Construction contractors(s) |
| TGS | Site specific | Outlines devices and signage to be used on work sites and the implementation process.<br>The document must be prepared by an individual who has undertaken the 'Prepare a Work Zone Traffic Management Plan' training course and is certified to the required level. | Construction contractors(s) |
| VMP | Site specific | Diagram displaying preferred travel paths for vehicles entering, exiting or crossing a traffic stream to a work site. | Construction contractors(s) |
| PeMP | Site specific | Diagram outlining pedestrian routes along or through a work site. The plan is to include proposed signs and devices. | Construction contractors(s) |
| PaMP | Site specific | Outlines parking requirements and arrangements. This document is to be guided by the parking requirements from TfNSW or relevant Local Councils. | Construction contractors(s) |
| Road Occupancy License (ROL) | Site specific | Required for any activity which may impact traffic flow.<br>The ROL requirements are outlined in the RMS Road Occupancy Manual. | Construction contractor(s) |

#### 1.4.1.1 Framework Construction Traffic Management Plan

This Framework CTMP outlines areas expected to be impacted by the construction works and provides a suite of traffic management measures (Section 5) to be implemented on work sites to minimise impacts to existing road users, pedestrians, cyclists and other relevant user groups. The document is to be used as a guide when developing SSCTMPs and other management plans.

#### 1.4.1.2 Site-specific Construction Traffic Management Plan

The construction contractor(s) will be responsible for preparing SSCTMPs for various work sites guided by the Framework CTMP. A SSCTMP will build upon the Framework CTMP, detailing specific traffic management measures to be implemented for the work site. The contents of the plan will include parking arrangements, access points to and from the site, haulage routes, changes to existing parking, public transport stops, pedestrian and cyclist facilities and general traffic management.

For long-term works, i.e. activities lasting beyond one standard shift, the document will need to provide an inspection process to ensure the continual safe operation and efficiency of the proposed traffic management schemes. This is not a requirement for short-term works which is defined as works occurring within one standard shift.

These plans are required as part of the construction phase to assess the local traffic impacts of work sites once finalised. Where applicable a SSCTMP may cover a number of work sites depending on a range of factors including proximity and expected activities onsite.

It should be noted that the location of work sites is subject to change. In the event that during the tendering process, the appointed construction contractor(s) proposes compounds that differ from those identified in the project's traffic and transport report, plans will need to be updated to capture all proposed compounds.

# 2 Objectives and Principles

This section outlines the objectives of the Framework CTMP and the high-level principles that can be used to achieve them.

## 2.1 Traffic Management Objectives

The key aim of this Framework CTMP is to minimise impacts to the surrounding transport network during construction. The following objectives have been developed to support this overarching aim:

- ensure safety of pedestrians, cyclists, construction workers, road users and the local community
- minimise the overall impacts to road users
- ensure minimal disruptions to public transport operations, including schedules, stop location and routes
- maintain access for existing road users, including the local community, public transport operators, pedestrians and cyclists
- ensure disruption to residents, local businesses and agricultural uses are minimised including appropriate consultation
- ensure construction vehicle movements remain below the volumes specified in the EIS, particularly during the peak hours
- minimise disruption to existing road furniture and kerbside provisions including existing bus stops, cycleways and on-street parking
- comply with all relevant legislation and other requirements specified by relevant authorities.

## 2.2 Traffic Management Principles

To achieve the objectives outlined above a set of principles have been developed to guide all construction management measures across the project. The key principles are as follows:

- clear and timely communication in relation to any changes, to affected areas and the expected duration of works via various platforms through the project website, radio, newspapers, social media or direct community engagement
- implement appropriate traffic controls including signage, line marking and stop lights to direct private vehicles, transport operators, pedestrians and cyclists past work sites. Alternative routes may be provided where existing infrastructure is impacted by the works
- manage site compounds and work areas to ensure construction traffic and works are primarily contained within these areas and road occupancy is minimised

- manage pedestrians and other vulnerable road users to ensure safe and continuous movement past the work sites. Consideration of the land uses and key pedestrian desire lines in the surrounds of the work sites will be the key drivers for the type of traffic management strategies implemented
- where practical, consideration of scheduling construction traffic movements to avoid peak times and smoothing of peaks in construction traffic activity to minimise impacts to the transport network
- encourage construction workers, where possible, to use modes other than private vehicle.

These principles are to be communicated to any parties involved in construction traffic management across the project and have been used to develop the measures outlined in Section 5. Any issues arising during the works will also require notification to the users outlined, ensuring transparency across the duration of the construction phase.

## 2.3 Existing User Group Hierarchy

During preparation of the SSCTMPs, prioritisation of potential user groups is important in providing appropriate construction traffic management measures at each work site. The hierarchy of users is listed below from highest to lowest:

- pedestrians
- cyclists
- public transport users
- service vehicles (relating to businesses and agricultural uses)
- private vehicles.

The development of the user group hierarchy has been based on similar approaches applied in Framework CTMPs for other large infrastructure schemes. This hierarchy also aligns with the Camellia-Rosehill Place Strategy. This hierarchy will be considered alongside the TfNSW functional road hierarchy provided below (in order of high to low priority roads) during the development of management measures:

- primary arterial roads
- sub-arterial roads
- collector roads
- local roads.

## 2.4 Governance

The document owner of the Framework CTMP will be appointed during the procurement process and the governance of the construction traffic management process will be discussed and developed with the Department of Planning, Housing and Infrastructure (DPHI) as the project progresses.

# 3 Construction Works

## 3.1 Construction Overview

The project will involve a range of activities during the different construction phases as summarised in Table 3.1.

**Table 3.1: Overview of Construction Activities**

| Activity | Task within Activity |
|---|---|
| **WRRF construction** | Site establishment, mobilisation |
| | Site earthworks, stockpiling, storage and removal of materials |
| | Civil works |
| | Structural construction work |
| | Mechanical and electrical installation |
| | Demobilisation and landscaping |
| | Commissioning |
| **Camellia pumping station upgrade** | Site establishment, mobilisation |
| | Mechanical and electrical installation |
| | Demobilisation |
| **Brine, transfer and river release pipelines** | |
| **Phase 1** | Site establishment and mobilisation |
| | Installation of environmental controls such as erosion and sediment control |
| **Phase 2** | Site earthworks including excavation for trenches, launch and receival pits for trenchless pipe sections |
| | Access the existing pipeline for relining sections |
| **Phase 3** | Installation of pipe bedding material and pipelines, including placement of the section of the pipes near the trench in a line (pipe stringing) |
| | Backfilling of excavations |
| | Civil works such as pipeline and ancillary infrastructure including the barometric loop would also be installed during this stage |
| **Phase 4** | Construction of river release structure |
| **Phase 5** | Commissioning |
| **Phase 6** | Landscaping works |
| | Rehabilitation including road restoration |

The construction methodology for the GPOP Water Recycling Management pipelines will primarily involve open trenching, with trenchless techniques such as Horizontal Directional Drilling (HDD) used in sensitive or constrained areas. Open trenching will be applied where feasible, with trench depths ranging from 1.5 to 7 metres and a typical construction corridor of up to 30 metres to accommodate excavation, pipe laying, and machinery. In contrast, HDD will be used to minimise surface disruption in environmentally sensitive zones, under waterways, and at major road crossings. This method involves

drilling a pilot bore, enlarging it, and pulling the pipeline through in a single operation. The final construction approach may be refined based on contractor input, site-specific conditions, and regulatory requirements, ensuring minimal environmental impact and alignment with best practices.

## 3.2 Description of Construction Activities

Key activities for construction of the WRRF include:

- site establishment
- delivery of materials
- earthworks
- civil works
- structure construction
- installation of mechanical and electrical plant and equipment
- landscaping and rehabilitation
- commissioning.

The new sections of pipelines from the WRRF to Camellia Pumping Station and the river release location will be constructed using a combination of trenching and horizontal directional drilling techniques. Between Camellia Pumping Station and the NSOOS, the existing rising main will be relined and repurposed to form part of the brine pipeline.

The upgrade of the Camellia Pumping Station will include augmentation of underground infrastructure, installation of pumps and the upgrade of power supply.

### 3.2.1 Compounds and Shipments

The compounds referenced in this section are based on the compounds submitted by Jacobs in June 2025. It is understood that Sydney Water are in the process of finalising the locations of these compounds. Table 3.2 summarises the construction section compounds.

**Table 3.2: Compounds and Shipments**

| Area | Construction Section | Construction Length | Number of Compounds |
|---|---|---|---|
| **Brine pipeline** | Reline | 765 m | 6 (C1 to C6) |
| | Reline | 20 m | 0 |
| | Reline | 650 m | 5 (C7 to C11) |
| | Reline | 80 m | 0 |
| | Reline | 440 m | 4 (C12 to C15) |
| **Transfer pipeline** | Open trench | 255 m | 3 (C14 to C16) |
| | Trenchless | 1,120 m | 0 |
| **Camellia-Rosehill WRRF** | Not applicable | Site area | 1 (C17) |

| Area | Construction Section | Construction Length | Number of Compounds |
|---|---|---|---|
| **River release pipeline** | Trenchless | 340 m | 1 (C18) |
| | Open trench | 1,400 m | 4 (C19, C22 to C24) |
| | Trenchless | 50 m | 2 (C20 to C21) |
| | Open trench | 1,400 m | 2 (C25 to C26) |
| | Trenchless | 650 m | 2 (C20 to C21) |
| | Open trench | 670 m | 1 (C27) |
| | Trenchless | 2,200 m | 3 (C26 to C28) |
| | Open Trench | 1,020 m | 4 (C28 to C31) |
| | | **Total** | 31 |

As noted in Table 3.2, there are a total of 31 compounds that will be set up for construction.

## 3.3 Construction Programme

Refer to Section 4.1.3 of the project's traffic and transport report for further details regarding the construction phasing and programme.

## 3.4 Hours of Operation

Most construction works will be carried out during standard working hours as defined by the Interim Construction Noise Guidelines (DECC, 2009a):

- Monday to Friday 7:00am and 6:00pm
- Saturday 7:00am and 1:00pm
- Sunday/ Public holiday no work.

However, due to the size and duration of the project, out of hours work may be required for certain project locations and activities. These include:

- delivery of oversized plant or structures that police or other authorities determine to require special arrangements to transport along public roads
- trenched pipeline construction along busy roads, such as along the brine pipeline alignment, to minimise traffic impacts
- works that cannot be completed within the standard respite periods for engineering reasons. This includes large trenchless pipeline construction sections such as tunnelling and horizontal directional drilling which might require 24 hours for short periods of times (up to one month).

The exact locations and duration of out of hours work will be determined during the construction planning phase of the project when a construction contractor has been engaged. Communities will be notified of any out of hours works in line with the Interim Construction Noise Guidelines and as outlined in the project's Community and Stakeholder Engagement Plan.

The appointed contractor will be responsible for instructing and controlling all subcontractors regarding the hours of work. Any work outside the approved construction hours would be subject to specific prior approvals.

Notwithstanding, Table 3.3 indicates the estimated working hours for the compounds that will be set up during construction.

**Table 3.3: Compound Details**

| Number | Location | Compound Type | Likely Duration | Hours of Construction |
|---|---|---|---|---|
| C1 | Kissing Point Road, Dundas | Satellite | 1 month | 24 hour (State Road) |
| C2 | Junction of Kissing Point Road and Rippon Avenue, Dundas | Satellite | 1 month | 24 hours (State Road) |
| C3 | Kissing Point Road verge, Dundas | Laydown | 1 month | 24 hours |
| C4 | Anderson Avenue, Dundas | Satellite | 1 month | Standard construction hours |
| C5 | Anna Maria King Park, Dundas | Satellite (pipe lining) | 1 month | Standard construction hours |
| C6 | Victoria Road North, Dundas | Satellite (pipe lining) | 1 month | 24 hours |
| C7 | Victoria Road South, Dundas | Satellite (pipe lining) | 1 month | 24 hours |
| C8 | Railway Street, Dundas | Satellite (pipe lining) | 1 month | Standard construction hours |
| C9 | Railway Street South, Parramatta | Satellite (pipe lining) | 1 month | Standard construction hours |
| C10 | Western Sydney University Carpark, Parramatta | Satellite (pipe lining) | 1 month | Standard construction hours |
| C11 | Western Sydney University South, Parramatta | Satellite (pipe lining) | 1 month | Standard construction hours |
| C12 | 181 James Ruse Drive, Camellia | Satellite (pipe lining) | 1 month | Standard construction hours |
| C13 | 175 James Ruse Drive, Camellia | Satellite (pipe lining) | 1 month | Standard construction hours |
| C14 | Grand Avenue North Car Park, Rosehill | Satellite | 4 months | 24 hours (intermittent) |
| C15 | Camellia pumping station compound | Main | 24 months | Standard construction hours |
| C16 | Grand Avenue, Rosehill | Tunnelling | 4 months | 24 hours (intermittent) |
| C17 | WRRF Compound | Main | 36 months | 24 hours (for 3 months) otherwise standard construction hours with occasional OOHW |
| C18 | Carnarvon Street, Silverwater | Tunnelling | 4 months | Standard construction hours, some OOHW intermittently |
| C19 | Derby Street, Silverwater | Satellite | 18 months | Out of hours (Night time/weekend) |
| C20 | Silverwater Road West, Silverwater | Tunnelling | 4 months | 24 hours |
| C21 | Silverwater Road East, Silverwater | Tunnelling | 4 months | 24 hours |
| C22 | Hume Park, Silverwater | Satellite | 18 months | Standard construction hours |
| C23 | Grey Street, Silverwater | Satellite | 18 months | 24 hours |
| C24 | Deakin Park, Silverwater | Satellite | 18 months | Standard construction hours |
| C25 | Pierre de Coubertin Park North, Silverwater | Satellite | 18 months | Standard construction hours |

| Number | Location | Compound Type | Likely Duration | Hours of Construction |
|---|---|---|---|---|
| C26 | Pierre de Coubertin Park South, Silverwater | Tunnelling | 6 months | Standard construction hours |
| C27 | URBN Surf Carpark, Olympic Park | Tunnelling | 6 months (Carpark A)<br>8 months (Carpark B) | Standard construction hours (Carpark A)<br>24 hours (Carpark B) |
| C28 | Meadowbank Park, Meadowbank | Main | 8 months | 24 hours |
| C29 | Meadow Crescent/Memorial Park | Satellite | 7.5 months | Standard construction hours |
| C30 | John Whitton Bridge West, Meadowbank | Satellite | 6 months | Standard construction hours with 2 x 24 hour weekends |
| C31 | John Whitton Bridge East, Meadowbank | Satellite | 6 months | Standard construction hours |

## 3.5 Construction Phasing and Programme

The expected duration of works is approximately 36 to 40 months commencing in Q1 2028 and concluding in Q2 2031 and will be carried out over a staged period. Following this schedule, it is expected that operation will commence in Q4 2031.

A summary of the indicative program and construction staging is summarised in Table 3.4.

**Table 3.4: Indicative Program and Construction Staging**

| Activity | Indicative timing |
|---|---|
| WRRF construction | Q1 2028 – Q4 2030 |
| Camellia Pumping station upgrade | Q2 2028 – Q3 2030 |
| Transfer pipeline construction | Q2 2028 – Q3 2030 |
| Brine pipeline construction | Q2 2028 – Q3 2030 |
| River release pipeline construction including works within Parramatta River | Q2 2028 – Q3 2030 |
| Commissioning | Q4 2030 – Q2 2031 |
| Start operation | Q2 2031 |

The assumptions made for the construction timeframes include:

- 50% (Greenfield) contingency for HDD and 90% (High Density) contingency for Open Trench in accordance with Sydney Water's costing contingency
- one (1) crew only and tasks within each activity do occur concurrently.

The duration of works will vary. Peak construction traffic volumes are expected to occur in the earthworks and civil works phase when significant volumes of material will be transported to and from the respective worksites.

# 4 Construction Traffic

This section summarises the type and volumes of expected construction traffic and identifies potential impacts presented in the project's traffic and transport report.

## 4.1 Construction Vehicle Types

A range of construction vehicle types are expected to be used throughout the construction phase. The vehicles to be used by the construction contractor(s) are not limited to those listed in this section and SSCTMPs will be required to provide greater detail on the types of vehicles to be used at each compound and works area. The list of vehicles expected to be used by the construction contractor(s) are as follows:

- light vehicles
- truck and dogs
- concrete trucks
- cranes
- semi-trailers.

## 4.2 Construction Traffic Volumes

It should be noted that these volumes are based on daily and peak construction activities for each compound occurring simultaneously. In practice, the construction programs for all compounds will vary and therefore the actual traffic is likely to be less than that presented. Wherever possible, construction traffic management measures should be implemented by the construction contractor(s) to reduce construction traffic on these links at peak times.

### 4.2.1 Light Vehicles (LV)

The estimated LV movements are provided by Sydney Water which have been summarised in Table 4.1 for the different construction locations.

**Table 4.1: Estimated Daily and Peak LV Movements**

| Construction Location | Estimated Daily LV Movements | Estimated AM/ PM Peak Hour LV Movements |
|---|---|---|
| **WRRF Site** | 400 | 280 |
| **Transfer and brine pipelines (WRRF to Camellia Pumping Station)** | 30 | 21 |
| **Brine pipeline (Camellia pumping station to NSOOS)** | 24 | 17 |
| **River release pipeline** | 10 to 15 | 7 to 11 |
| **Camellia pumping station augmentation** | 30 | 21 |

Notably, it is assumed that approximately 70% of the daily construction movements will occur during the following AM/ PM peaks as most construction workers would arrive before or after the road network peak hours:

- **AM Peak:** 7:00 am to 8:00 am
- **PM Peak:** 5:15 pm to 6:15 pm.

### 4.2.2 Heavy Vehicles (HV)

The estimated HV movements are provided by Sydney Water which have been summarised in Table 4.2 for the different construction locations.

**Table 4.2: Estimated Daily and Peak HV Movements**

| Construction Location | Estimated Daily HV Movements | Estimated AM/ PM Peak Hour HV Movements |
|---|---|---|
| **WRRF Site** | 300 | 38 |
| **Transfer and brine pipelines (WRRF to Camellia pumping station)** | 2 | 2 |
| **Brine pipeline (Camellia pumping station to NSOOS)** | 1 | 1 |
| **River release pipeline** | 20 | 3 |
| **Camellia pumping station augmentation** | 30 | 4 |

### 4.2.3 Total Daily and Peak Hour Volumes

With regards to the total daily and AM/ PM peak hour traffic movements, Table 4.3 indicates the total LV/ HV movements within the respective construction locations.

**Table 4.3: Estimated Daily and Peak Construction Vehicle Movements**

| Construction Location | Type of Vehicle | Estimated Daily Movements | Estimated AM/ PM Peak Hour Movements |
|---|---|---|---|
| **WRRF site** | LV | 400 | 140 |
| | HV | 300 | 38 |
| **Transfer and brine pipelines (WRRF to Camellia pumping station)** | LV | 30 | 11 |
| | HV | 2 | 2 |
| **Brine pipeline (Camellia pumping station to NSOOS)** | LV | 24 | 9 |
| | HV | 1 | 1 |
| **River release pipeline** | LV | 15 | 6 |
| | HV | 20 | 3 |
| **Camellia pumping station augmentation** | LV | 30 | 11 |
| | HV | 30 | 4 |

## 4.3 Construction Vehicle Routes

### 4.3.1 WRRF

Generally, construction vehicles have origins and destinations from a wide variety of locations throughout Sydney.

Truck drivers will be advised of the designated heavy vehicle routes to and from the site. The directional distribution and assignment of traffic will be influenced by several factors, most notably the origin/ destination of materials and configuration of the arterial road network.

Figure 4.1 shows the anticipated route to the WRRF.

**Figure 4.1: Construction Vehicle Approach Routes**


Source: Google Maps

It is noted within Section 2.2 that construction vehicles heading towards the Devon Street access point will be travelling from James Ruse Drive to enter the WRRF site and will travel on the James Ruse Drive/ Grand Avenue and Grand Avenue/ Colquhoun Street intersections. Construction vehicles heading towards the Unwin Street access point will be travelling from either side of Parramatta Road and then turn onto Wentworth Street to enter the WRRF site.

Figure 4.2 displays the anticipated transport route from the WRRF.

**Figure 4.2: Construction Vehicle Departure Routes**


Source: Google Maps

In order to exit the Devon Street access point, vehicles will travel back onto James Ruse Drive to head northbound or southbound. For the Unwin Street access point, vehicles will head back towards Parramatta Road via Wentworth Street.

### 4.3.2 Transfer and Brine Pipelines

When travelling to the transfer and brine pipelines (WRRF to Camellia Pumping Station), LV and HV will travel to/ from James Ruse Drive to Grand Avenue to enter and exit the respective compounds (C12 to C16).

When travelling to the brine pipeline, LV and HV will travel to/ from James Ruse Drive to the Western Sydney University (WSU) – Parramatta Campus' internal private roads, Victoria Road, Rippon Avenue and Kissing Point Road.

This is further detailed in the Traffic and Transport Impact Assessment Report.

### 4.3.3 River Release Pipelines

The assessment of the river release pipelines has been cordoned off in nine different sections. An overview of the construction vehicle routes is outlined below:

- **River release pipeline sections 1 and 2:** LV and HV would travel to and from the Western Motorway to Beaconsfield Street, Silverwater Road, Carnarvon Street, Vore Street and Derby Street to enter and exit the respective compounds (C18 to C20 and C22 to C24)
- **River release pipeline section 3:** LV and HV would travel to and from the Western Motorway to Silverwater Road, Derby Street, Day Street North and Fariola Street to enter and exit the respective compounds (C21)
- **River release pipeline section 4:** LV and HV would travel to and from the Western Motorway to Hill Road, John Ian Wing Parade, Newington Boulevard, Comaneci Avenue and Ali Parade to enter and exit the respective compounds (C25 to C26)
- **River release pipeline sections 5, 6 and 7:** LV and HV would travel to and from the Western Motorway to Silverwater Road, Hill Road and Holker Street to enter and exit the respective compounds (C27)
- **River release pipeline sections 8 and 9:** LV and HV would travel to and from Victoria Road to Adelaide Street and Constitution Road to enter and exit the respective compounds (C28 to C31).

This is further detailed in the Traffic and Transport Impact Assessment Report.

## 4.4 Construction Impacts

The construction impact assessment outlined three different intersections that required an assessment with its modelling outcomes identified in Section 7.1 of the project's traffic and transport report when vehicles were accessing the WRRF site. The three intersections assessed were:

- Grand Avenue/ James Ruse Drive
- Parramatta Road/ Wentworth Street
- Grand Avenue/ Colquhoun Street.

The assessment concluded that the Grand Avenue/ Colquhoun Street intersection in the base case (2025) and future base case scenarios (2028) operates well.

The James Ruse Drive/ Grand Avenue and Wentworth Street/ Parramatta Road intersections operate unsatisfactorily with a poor LoS, high average delay, high DoS and high queue lengths both in the base case (2025) and future base case scenarios (2028). With the addition of construction traffic at both intersections during the AM Peak, it is noted that certain mitigation traffic management measures may be required.

With the addition of construction traffic at both intersection during the PM Peak, the traffic impacts are minimal when compared to the future base case scenario.

With regards to the construction impacts at the respective pipelines, three different ratings were assigned to each section of the pipelines that were assessed, as identified in Section 7.2 and 7.3 of the project's traffic and transport report. The respective ratings and their meanings have been described as follows:

- Low indicates minimal impact and therefore mitigation measures are likely not required
- Medium indicates likely impacts to the road network; however, these are generally more localised. It is recommended that these impacts be monitored prior to implementation of mitigation measures
- High indicates impacts that may cover larger areas along the project corridor. Impacts classified as high will require mitigation measures.

Notably, the following ratings were provided to the different pipelines:

- Transfer pipeline had 1 medium rating
- Brine pipeline had 1 low, 3 medium and 1 high ratings
- River release pipeline had 3 medium and 3 high ratings.

# 5 Construction Traffic Management Measures

Aligning with the principles presented in Section 2.2, this section outlines construction management measures that can be implemented across various aspects of the project.

## 5.1 Haulage Routes

The proposed haulage routes during construction will be guided by the functional hierarchy provided by TfNSW and are outlined below in order of high to low priority roads:

- primary arterial roads
- sub-arterial roads
- collector roads
- local roads.

Access routes to and from the sites will primarily use arterial roads which are more suited to accommodate construction traffic. The use of local roads is to be avoided, however, if required, justification will need to be provided and documented in the SSCTMP. Relevant government bodies which include Council and TfNSW will be consulted during the development of the haulage routes for different work site, with the proposed routes documented in the respective SSCTMP.

To guide the appointed construction contractor(s), Section 4.3 indicates appropriate haulage routes which consist of arterial roads and the Safety, Productivity and Environment Construction Transport Scheme (SPECTS) network in the vicinity of the study area. SPECTS is a voluntary scheme which provides improved road access for heavy vehicles which meet a specified level of environmental, safety and compliance. These requirements include:

- Performance Based Standards (PBS) approved
- fitted with at least a Euro 5 engine
- fitted with a range of safety features
- fitted with satellite tracking; and
- mass assurance systems to ensure the vehicle is travelling at the correct weight.

The construction contractor(s) will be responsible for providing the finalised haulage routes during construction as part of the SSCTMPs using the Framework CTMP as guidance.

## 5.2 Management of Heavy Vehicle Movements and Vehicle Marshalling

SSCTMPs will be required to demonstrate how heavy vehicles movements will be managed to and from work sites to minimise potential queuing onto the public network and impacts to existing user groups.

Management of heavy vehicles will need to address requirements from relevant stakeholders and may include:

- the use of marshalling areas for vehicles waiting to access the site
- entry and exit points
- turning restrictions for large vehicles
- stop lights
- designated unloading or pickup locations
- any other mechanisms which allow for the safe and efficient movement of heavy vehicles.

All vehicles are to enter and exit the work sites in a forward direction to allow for clear sightlines. If this is not permissible, then appropriate traffic controls are to be provided as per Section 7.3 of the Guide to Traffic Control at Work Sites Manual (RMS).

Truck marshalling areas may be required during peak construction periods to manage construction vehicles and minimise congestion on the road network. These areas will need to be outlined in the SSCTMPs, accompanied by strategies to manage the traffic accessing these sites.

## 5.3 Work Zones

Existing kerbside space adjacent to work sites may be temporarily required during construction due to potential constraints on parking or unloading / pick up locations along the project corridor. The construction contractor(s) will be required to apply for works zones from the relevant authority, with Council having jurisdiction over local and regional roads and TfNSW for State roads. To minimise impacts to the road network, the use of works zones are to be kept to a minimum and not impact existing public transport locations where possible. In the case a public transport operator is impacted, an alternative stop location must be agreed with the operator and TfNSW. The locations of all works zones are to be documented in the SSCTMPs.

## 5.4 Worker Access and Parking

The provision of parking will vary between work sites as it will be driven by the activities occurring within each site. Site compounds which serve as a site office will have provisions for light vehicle parking. For site compounds which are expected to generate heavy vehicle movements, a designated area for unloading and pickup will be available within each work site. In the case that a site does not permit parking due to its constrained nature, the construction contractor(s) may apply for a works zone to use existing kerbside space, however, this is to be kept to a minimum with workers encouraged to use public transport to access work sites where possible. The use of public transport will particularly be encouraged in transfer pipeline section 1 as there is a light rail stop, which has frequent services.

For the remaining pipeline sections, public transport services are more sporadic and therefore most workers will access compounds and work areas using private vehicles. In all cases workers will be encouraged to carpool to minimise the parking requirements within sites.

Notwithstanding, a shuttle bus service could be explored by the construction contractor(s) for workers at the WRRF site and the Clyde Train Station. The Clyde Train Station is the nearest railway station to this location. This measure should be investigated by the construction contractor(s) at the tendering stage to reduce construction worker related traffic at peak times.

## 5.5 Driver Training

All drivers operating heavy vehicles will need to be inducted prior to accessing any work sites to ensure they are aware of all the traffic management strategies and controls. This may include haulage routes, entry and exit points, turning restrictions, unloading/ pick up locations and any other onsite heavy vehicle requirements.

The construction contractor(s) is to ensure that drivers are informed of any changes which may impact their route or access to a work site.

## 5.6 Emergency Vehicle Access

Access to the subject site by emergency vehicles may be restricted at certain pipeline section relining or construction works. However, as much as practically possible, clear access to emergency vehicles will be provided at all times and emergency protocols on the site would include a requirement for suitably accredited site personnel to assist with emergency access from the street.

Furthermore, liaison would be maintained with the police and emergency services agencies throughout the construction period and a 24-hour contact would be made available for ‘out-of-hours’ emergencies and access. Immediate notification will be given to relevant authorities, and traffic management personnel will implement necessary detours or lane closures. Temporary traffic control measures, such as signage and manual traffic control, will be deployed to ensure safety and minimise disruptions. Coordination with emergency services and utility providers will ensure a swift response, with all stakeholders informed of procedures in advance.

All site-inducted vehicles will be equipped with basic tools for emergency repair/ maintenance and response, and tool kits will be available on-site at all times

Available roadside assistance services and/or local repair shops will be communicated to workers and drivers as appropriate, as part of site induction processes and toolbox talks.

## 5.7 Traffic Controls

The construction contractor(s) is responsible for developing the SSCTMPs which will detail traffic management measures to minimise potential construction impacts and the proposed implementation process. This may include stop lights, traffic controllers, spotters, signposting and other requirements specified by relevant authorities.

### 5.7.1 Policy and Responsibilities

Traffic controls are important to safely manage traffic, as it provides clear direction for road users, minimises potential conflicts and allows for another degree of separation between vehicles, workers and vulnerable road users. Traffic controls at work sites are to comply with the latest edition of the Traffic

Control at Work Sites Manual (RMS) and the Australian Standard AS 1742.3 Manual of uniform traffic control devices –Traffic control for works on roads.

The construction contractor(s) is to ensure mechanisms are in place across the work sites for safe and efficient operation through the form of TGS. It is the responsibility of all workers engaged on the project to uphold these directives and ensure safety is always at the forefront when undertaking any works.

TGS are to be prepared by a suitably qualified person who holds a current RMS certificate – Prepare Work Zone Traffic Management Plan.

In the case that temporary speed limits are required, the construction contractor(s) will be required to submit an application for approval. This application will need to be submitted with sufficient time for processing and authorisation prior to implementation.

### 5.7.2 Traffic Control Techniques

There are a range of traffic control mechanisms which can be employed at the work sites. In developing the appropriate controls, consideration must be given to the user hierarchy (Section 2.3) and safety of personnel working near or on roads. The Traffic Control at Work Sites Manual (RMS) provides a comprehensive list of traffic control devices which can be used to guide this process.

For long-term works where traffic management devices are required beyond one shift, regular inspections are to be carried out by the construction contractor(s). This is to ensure that the controls in place continue to provide safe traffic management. All controls are to comply with the current RMS guidelines.

### 5.7.3 Plant and Equipment

Any plant proposed near traffic or pedestrians and cyclists is to be separated using physical protection, with warning signs provided for public safety.

### 5.7.4 Inspections of Roadwork Traffic Management Schemes

For long-term works, traffic management road inspections are required to be carried out regularly to ensure the safe movement of traffic and the protection of other users. The requirement to undertake inspections of traffic control measures is outlined in Section 6.1 of the Traffic Control at Work Sites Manual (RMS) and Appendix A of Australian Standard AS 1742.3 – Manual of uniform traffic control devices – Traffic control for works on roads.

There are three main types of inspections to be carried out:

- pre-start and pre-close-down inspections of short-term traffic control
- weekly inspections of long-term traffic control
- night inspections of long-term traffic control.

Appendix E of the Traffic Control at Work Sites Manual provides inspection checklists and forms that can be used for all inspections, whether short term, long term or night. The responsibility and frequency of the inspections required is provided in Section 6.1 of the Traffic Control at Work Sites Manual (RMS).

### 5.7.5 Traffic Controllers and Temporary Traffic Signals

The use of traffic controllers and / or temporary traffic signals to control traffic at worksites is to be in accordance with the Traffic Control at Work Sites Manual (RMS).

Variable Message Signs (VMS) will be used to inform drivers, where necessary, to avoid particular roads or areas where activities associated with the project would cause disruption. Where these are used, it is to be in accordance with documented Austroads Guidelines, RMS supplements, procedures, guidance and approval of the road authority.

The placement of temporary VMS must consider pedestrian safety and disabled access needs when placed on footpaths. A ROL may be required when a portable VMS is proposed in a parking or loading bay. VMS placement should conform to Austroads Guidelines, RMS supplementary material and approval processes of the road authority.

## 5.8 Management of Work Sites

### 5.8.1 Work Site Boundaries

Details of the proposed erection and maintenance of hoardings, scaffolds and associated structures will be documented in the SSCTMPs. Where reasonable and feasible, all work site boundaries will be clearly defined with the use of hoardings. The SSCTMPs will identify the boundaries, detail accesses and road controls. Activities within the work site are excluded from the SSCTMPs, except in relation to ensuring the movement of construction traffic in and out of the worksite is physically possible and can be conducted in a safe manner. Work sites include any gantries (eg Type B hoardings) and SSCTMPs will consider the impacts of these on roads and footpaths.

### 5.8.2 Site Security and Access

The issues to be considered in determining the location of site accesses are:

- safety of travelling public
- safety of construction workers and equipment
- efficient and safe entry and exit to the site including turning paths, consistent with the requirements of relevant Australian Standards, Austroads or RMS guidelines
- impact on local communities in terms of safety, noise and road damage
- site security.

The work sites will have appropriate arrangements to discourage entry without approval and minimise vandalism. All access points to work sites will have lockable gates.

### 5.8.3 Pedestrian Security/ Safety/ Lighting

The consideration of safety and security issues for pedestrians will be considered at all work sites where footpaths exist adjacent to the site. Any footpath or cycle routes which will be impacted by construction works require a condition assessment to ensure that they remain suitable for use. This

would include an assessment of the paving and lighting of the footpath/ cycle route to maintain a safe and suitable passage.

Any hoardings or other structures on the site boundaries will have lighting in accordance with current standards, particularly where existing street lighting is removed or obscured because of the site works. In locations where this occurs, supplementary lighting is to be provided to meet the current standards.

### 5.8.4 Management of Risk to Vulnerable Road Users

The construction contractor(s) is to adopt applicable vulnerable road user safety measures to minimise the road safety risks to pedestrians, cyclists and motorcyclists on route to, and near, construction sites. Such measures include, but are not limited to:

- the deployment of speed awareness signs in conjunction with VMS
- heavy vehicles equipped with safety technology and equipment to improve vehicle safety, visibility and the detection of vulnerable road users. SPECTS provides further information on appropriate safety devices
- provision of driver training, instruction and information regarding haulage routes, potential changes, common road users and hazards / risks along the routes
- mandatory completion of heavy vehicle driver introduction training.

Where work sites have an impact on footpaths, consideration must be given to the requirements of all pedestrians and especially where there is the potential for vulnerable road users, such as school children, elderly people and mobility impaired users. This is to include condition surveys of affected footpaths to ensure that they are suitable and appropriate for use.

Disability Discrimination Act requirements will be adopted with kerb ramps or other measures provided at road crossings. Footpath widths are required to provide for two-way pedestrian traffic allowing for prams or strollers and wheelchairs to pass each other without requiring temporary widening from their existing width prior to construction commencement. Narrowing of the footpath width, if required, is to be approved by the relevant authorities.

Where high numbers of vulnerable road users are using a footpath, special provision and design consideration may be required to mitigate any impacts.

# 6 Consultation and Approvals

This section identifies the key stakeholders in construction and addresses the relevant communication protocols the construction contractor(s) will be required to adhere to when implementing construction traffic management measures, including any relevant approvals processes.

## 6.1 Stakeholders

As part of the SSCTMP, affected stakeholders will need to be identified at an early stage and consulted throughout the construction process. The key stakeholders include:

- Parramatta City Council
- City of Ryde Council
- TfNSW
- DPHI.

In addition to the agencies stated above sensitive receivers such as adjacent landowners, businesses and nearby local communities have been identified as part of the EIS process. Many of these will need to be considered when developing SSCTMPs and construction traffic management measures.

It is noted that Transport for NSW has jurisdiction over all State roads and will need to be consulted on all transport issues.

## 6.2 Communication

Communication with stakeholders and authorities throughout the construction phase is key in ensuring they are informed and do not experience unexpected disruption. The different communication techniques to be used in the construction phase will be dictated by Sydney Water's Community Engagement Plan.

## 6.3 Approvals

All construction traffic management documents developed as part of the construction phase will be required to obtain the appropriate approvals. Table 6.1 outlines the varying submission requirements and potential stakeholders relevant to different documentation. Prior to construction, each document will be approved by the relevant approving authority.

**Table 6.1: Approvals Process**

| Documentation | Submission Requirements | Key Stakeholders |
|---|---|---|
| Framework CTMP | This document is to be submitted with the EIS submission for approval. | • Sydney Water<br>• Local Councils<br>• TfNSW<br>• Western Sydney Planning Partnership. |
| SSCTMPs | This document is to include TGS, VMPs, PeMPs and PaMPs. | • Sydney Water<br>• Local Council<br>• TfNSW<br>• Western Sydney Planning Partnership. |
| Traffic Guidance Schemes | This document is to accompany the SSCTMP submission.<br>The plan is to comply with the following standards and guidelines:<br>• Australian Standard AS1742.3 – Manual of uniform traffic control devices<br>• Roads and Maritime Services NSW (RMS) – Traffic Control at Worksites Manual<br>• Relevant Austroads Guides<br>• RMS Supplements to Austroads and Australian Standards. | • Local Councils<br>• TfNSW<br>• Western Sydney Planning Partnership. |
| VMPs | This document is to accompany the SSCTMP submission.<br>The plan is to comply with the following standards and guidelines:<br>• Roads and Maritime Services NSW (RMS) – Traffic Control at Work Sites Manual. | • Local Councils<br>• TfNSW<br>• Western Sydney Planning Partnership<br>• Local residents and businesses. |

| Documentation | Submission Requirements | Key Stakeholders |
|---|---|---|
| PeMPs | This document is to accompany the SSCTMP submission.<br>The plan is to comply with the following standards and guidelines:<br>• Roads and Maritime Services NSW (RMS) – Traffic Control at Work Sites Manual. | • Local Councils<br>• TfNSW<br>• Western Sydney Planning Partnership<br>• Local residents and businesses. |
| PaMPs | This document is to accompany the SSCTMP submission. | • Local Councils<br>• TfNSW<br>• Western Sydney Planning Partnership<br>• Local residents and businesses. |
| Over-size or Over-mass Vehicle Access Permits | Online application via the National Heavy Vehicle Regulator (NHVR) portal 28 days prior to operation of the vehicle.<br>The construction contractor(s) should also check that the vehicle complies with the schedules and conditions in the relevant gazette notice available on the NHVR website. | • Local Councils<br>• Local residents and businesses. |
| Public Transport Adjustments | Consultation with TfNSW and relevant Local Councils. | • Public transport operators<br>• TfNSW<br>• Local Councils. |
| Impacted Local Roads | Dilapidation surveys to undertaken of local and Regional roads, used by construction heavy vehicles. A report is to be submitted within 3 weeks of completing the surveys and no later than 1 month before the use of local roads by heavy vehicles. | • Local residents and businesses. |

### 6.3.1 Council Traffic Committees

Each council is delegated authority by TfNSW on certain aspects for the control of traffic on regional and local roads, including regulatory signposting. The delegation requires council to seek the advice of the NSW Police and TfNSW prior to exercising these delegated functions. This is usually done through the establishment and consultation with the Local Traffic Committee.

Councils can sub-delegate the approval of certain traffic control measures, such as works zones, to an appropriate staff member. These further delegations are determined by each individual council. The construction contractor(s) will need to consult with local councils on the extent of the delegations.

Where possible, the construction contractor(s) should endeavour to secure all necessary council approvals under delegation to avoid the need for approvals to be secured through the Local Traffic Committee and council meetings.

The Local Traffic Committee is a technical committee that considers matters related to prescribed traffic control devices and traffic control facilities for which the council has delegated authority. These committees are made up of four voting members:

- one (1) representative of council (may be a councillor or council officer)
- one (1) representative of the NSW Police
- one (1) representative of TfNSW
- the local state Member of Parliament or their nominee.

Matters that may need to be considered by the Local Traffic Committee include:

- establishment of a kerbside work zone on a local or regional road
- CTMPs
- changes to parking restrictions
- changes to regulatory signage
- road closures.

Meetings of the Local Traffic Committee can be conducted as face-to-face meetings on a monthly basis, as electronic meetings or a combination of both formats.

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